The Start-Up Nation's Threat from Within

Dan Ben-David*

Abstract

Three main vantage points are brought together in this chapter: (1) Israel's relatively good economic performance in recent years – at least, in comparison with other Western countries that have still not emerged from the recession; (2) motivations for the wave of social protests that erupted in Israel in the summer of 2011, and; (3) the big picture, which is the primary one, incorporating the first two vantage points with additional issues, and framing them within long-run and international contexts. This third vantage point focuses on the very problematic trajectories that Israel has been on for decades and the state of some of the country's primary infrastructures – human capital and transportation – that underlie these trajectories. Space limitations do not make it possible to provide a full exposition of all three vantage points here. However, the conventional socioeconomic discussion in Israel often makes it difficult to see the forest for the trees. Hence, the emphasis here is on a perspective from a vantage point far above, so that it will be possible to see, to understand, and to internalize the magnitude and the implications of the entire picture.

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Israel's macro picture can be divided into three non-exclusive parts. The first are primary macroeconomic indices from recent years that, compared to leading Western countries, look quite favorable for Israel. The second aspect of the current macro picture is related to the causes underlying the massive social protests that came to a head in 2011 and are still simmering beneath the surface. And the third aspect of the current picture is how it relates to the bigger – long-run – macro trajectories that Israel is situated on.

These parts are not mutually exclusive because the current macro picture is rosy only in relative terms. The West – mainly the US and Europe – has been in the most severe economic downturn since the Great Depression while Israel's primary recession in recent decades occurred a decade ago, during the massive terror wave that accompanied the *intifada*. Since then, Israel has been emerging from that very problematic period while parts of the West are still undergoing some very difficult years. In the final analysis, both recent trends – Israel's and the West's – are relatively short-term and the respective countries will eventually return to their fairly steady long-run economic growth paths. The primary problem, as will be highlighted later in this chapter, is not with how the country is faring vis-à-vis countries currently experiencing a downturn, but rather with Israel's problematic long-run trajectories.

The issue of the summer protests in 2011 had to do with socioeconomic problems that are here and now in Israel: among these, high prices, social services in decline and inequality in incomes and services. Two chapters in this *Report* deal directly with some of the protest's underlying issues. The chapter by Michael Shalev, Johnny Gal and Sagit Azary-Viesel ("The Cost of Social Welfare: Israel in Comparative Perspective") focuses on underlying grievances of the middle class – focusing on young adults in their late twenties and early thirties since the 1990s – while the chapter by Reuben Gronau ("The Privatization of Social Services in Israel: Considerations and Concerns") looks at some of the implications of the privatization process that the government has adopted in administering social services. Some of these

problems are due to insufficient competition, others to inadequate regulation, and still others to a host of idiosyncratic issues with effects that differ across population sectors and geographic regions. One thing that many of them share is that they are tips of a much larger iceberg – and that iceberg is characterized by socioeconomic trajectories that are simply unsustainable in the long-run. These trends were highlighted in the *State of the Nation Report 2009* and as will be shown here, these problematic long-term trends continue unabated.

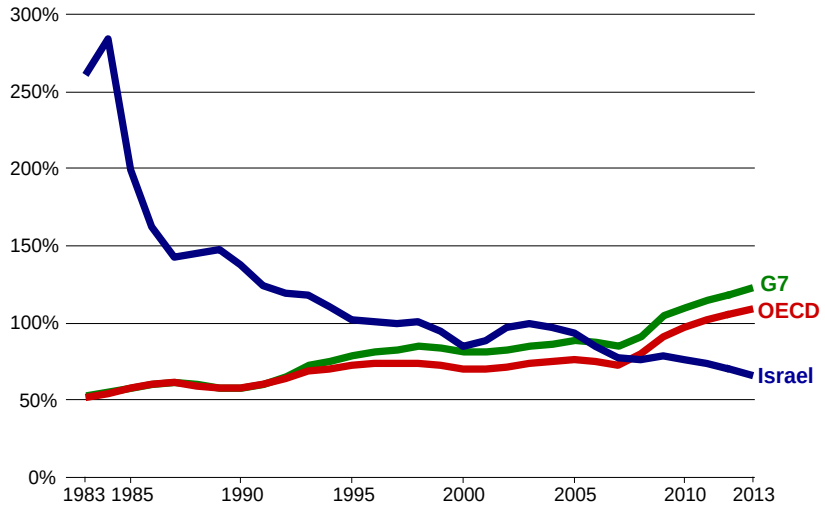
1. Some Aspects of the Current Macro Picture

Government Debt

Israel's macroeconomic behavior until the mid-1980s was so problematic that the government's extraordinarily high spending led to triple digit inflation – reaching 450 percent in 1984, the peak year – that threatened the economic viability of the country. If debt to GDP (gross domestic product) ratios in Europe that hover around 100 percent are considered high today, imagine the implications of such a ratio nearly reaching 300 percent, as was the case in Israel in 1984 (see Figure 1, which includes OECD projections through the year 2013). Then, when it was a step away from the brink, a far-reaching and enormously successful stabilization program was adopted that helped the country implement a dramatic change in direction in 1985, moving back from the brink and towards economic solvency.

Figure 1

Debt-GDP ratio, 1983-2013*



* OECD projections for 2012 and 2013.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: Bank of Israel, OECD Economic Outlook.

As documented in last year's *State of the Nation Report 2010* (Ben-David 2011b), while GDP per capita steadily increased, government after government kept a lid on expenditures with almost no change in real (i.e., after discounting inflation) government spending per capita during most of the past quarter century. The effect has been the steady multi-decade decline in Israel's debt-GDP ratio. The country has changed places with the OECD, not to mention the G7 countries that lead the Western world.[1] The average debt-GDP ratio in the OECD rose to 107.6 percent in 2011 (it is higher today) while debt in the G7 countries was 113.8 percent of GDP. By contrast, Israel's debt fell to 74.2 percent of GDP.

[1] The G7 countries include the United States, Canada, Japan, France, Germany, Italy, and the United Kingdom.

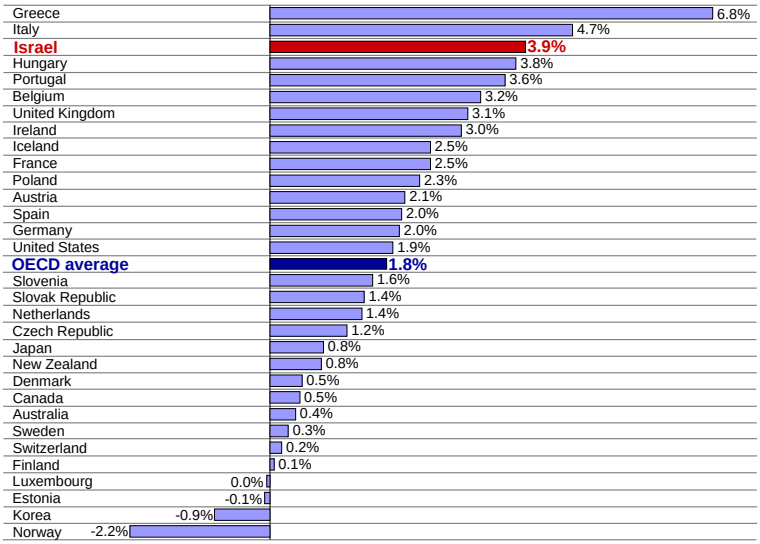
But while Israel and the OECD have switched places relative to each other's positions a decade ago, that picture is a bit misleading. As the Bank of Israel noted in its recent *Annual Report* (2012), the long-run interest rates that Israel borrows at today are still very high – in some cases, double – the rates charged to countries with substantially higher debt-GDP ratios.

Consequently, Israel's interest payments relative to its GDP are still much higher than the OECD average (Figure 2). In fact, Israel's share of net interest payments out of GDP is above all but two OECD countries: Greece and Italy, both of which are facing considerable economic distress. In other words, Israel's margin of error on the issue of debt is extremely small. Despite the steady reduction of its share of public expenditures to GDP for over a quarter century reaching a level that is among the lowest in the Western world – and the resultant, relative low debt-GDP ratio – Israel must still pay a high risk premium on its loans that raises the burden of these payments to nearly the top of the OECD.

Figure 2

Net interest payment on the government debt

as percent of GDP, 2011



Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: OECD Economic Outlook.

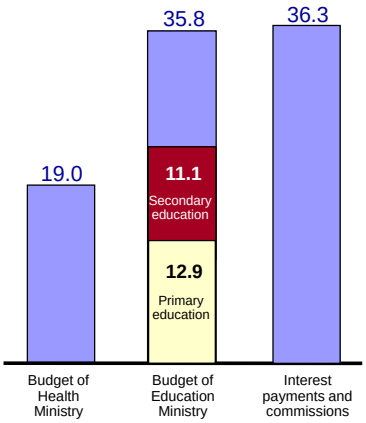
To put these interest rate expenditures into a more meaningful perspective, Figure 3 shows Israel's interest payments in terms of their cost in NIS (shekels). In 2011, Israel's interest payments reached NIS 36.3 billion. This was the penalty imposed on the country for not living within its means and having to borrow. It should be remembered that these interest payments must be paid above and beyond the principal that

must be returned. This is essentially money that is lost to the government since it is not available for spending on other budgetary needs.[2]

Figure 3

Government budget, 2011

in NIS billions



Source: Dan Ben-David, *State of the Nation Report 2009* (updated).
Data: Ministry of Finance.

Note that this amount is 51 percent greater than the country's entire primary and secondary education budget, and exceeds the entire education budget including academic institutions. The amount that the government had to spend on interest payments was 91 percent greater than its entire allocation for the Ministry of Health.

[2] This is not to say that all borrowing is bad. If it is used to finance a road that the next generation will also benefit from, for example, then there is no reason why they should not also participate in the financing of that road.

Therefore, it is difficult to over-exaggerate the importance of fiscal discipline. A lack of discipline is not only reflected in increasingly difficult access to international capital, it also takes a large bite out of the country's national priorities by substantially reducing the size of the budget remaining for dealing with the primary problems.

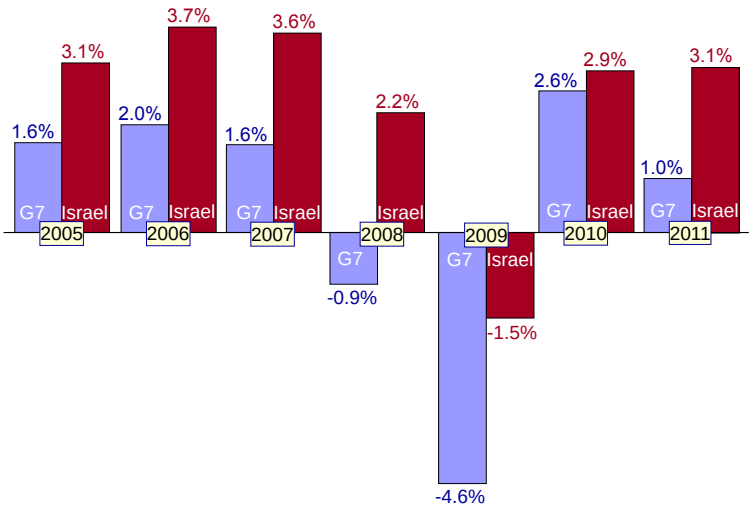
Economic Growth

When it comes to economic growth in the three years prior to the recent economic downturn in the West, Israel's growth rates exceeded those of the seven top Western economies (Figure 4). When the recession hit in 2008, the G7 countries moved into negative growth territory while Israel's growth rate fell, but still remained positive. The brunt of the recession was felt in 2009, with both the G7 countries and Israel exhibiting negative per capita economic growth. In the tentative recovery years that followed, Israel's growth rate continued to exceed the G7 rate.

Figure 4

Growth in GDP per capita

changes in GDP per capita in G7 countries and Israel, 2005-2011



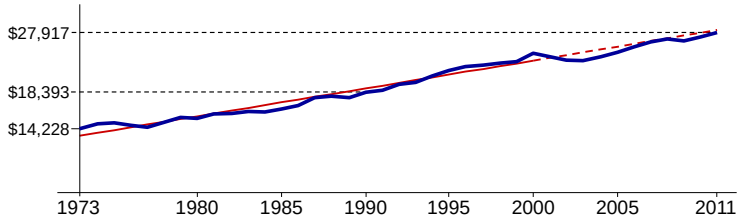
Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: OECD.

While this outcome is definitely preferable to the alternatives – for Israel – it is also a bit deceiving. As Figure 5 shows, Israel has been on a very steady economic growth path since 1973 and all of the fast growth that has occurred in recent years has reflected a return to this long-run path. If one takes the trend line for GDP per capita between 1973 and 2000 (the solid red line in the graph) and extrapolates this trend for the next 11 years (the dotted red line) – which include the severe recession in Israel in the early part of the last decade, the subsequent period of recovery, the Western recession and the recovery from that – then Israel in 2011 has essentially returned to the same long-run growth path that it has been on since the 1970s.

Figure 5

Israel's long-run growth path

GDP per capita, 1973-2011*



* In 2011 international dollars, logarithmic scale. The continuous red line corresponds to the level of GDP per capita from 1973-2000. The broken red line is an extrapolation over the next 11 years. The blue line corresponds to the actual growth path.

Source: Dan Ben-David, *State of the Nation Report 2009* (updated).

Data: Central Bureau of Statistics.

The problem is that this steady multi-decade path reflects economic growth that is slower than that in the West's leading countries over the long-run, which in turn means that Israel's living standards have been falling further and further behind those of the leading Western countries for decades (for a more complete analysis see Ben-David, 2010b).

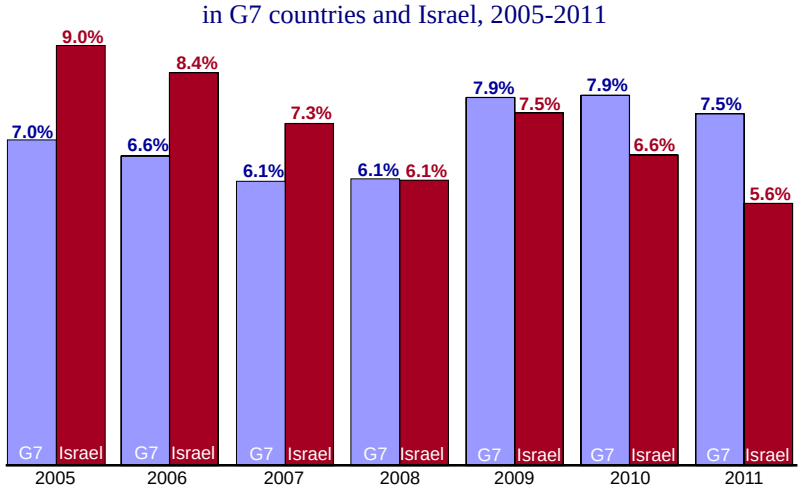
Unemployment

Another area in which Israel has experienced substantial gains in recent years is the area of unemployment/employment.[3] Unemployment rates have been falling for several years, from double digit levels in the 1990s and in the early part of the last decade. The decline is readily evident in Figure 6, which shows unemployment in Israel falling to G7 levels by 2008. In 2009, with the full brunt of the severe recession in the West, unemployment rates rose in Israel and in the G7 countries. They have since fallen in Israel to levels below the G7 as those countries struggle to emerge from the deep recession that they have undergone.

Figure 6

Unemployment rates

in G7 countries and Israel, 2005-2011



Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: OECD.

[3] At the time of this writing, unemployment in Israel has begun to rise again, though it is still too early to determine the extent of the problem and severity of the situation.

While the decline in Israel's unemployment rates is a very welcome turn of events compared to previous decades, it is necessary to keep in mind what this statistic shows and what it does not. Rates of unemployment measure the share of individuals not finding work out of those participating in the labor force. It does not include those who are not participating in the labor force altogether – and who, by definition, are not looking for work. The primary problem in Israel is the large size of this latter group.

Eran Yashiv shows in his chapter ("A Macro Perspective of the Economy and Society in Israel") that as unemployment rates have fallen since the deep recession and *intifada* in the early part of the past decade, labor force participation rates have increased – i.e., both indicators are moving in positive directions. However, as will be shown, the number of individuals who are not employed as a share of the entire population is still relatively high in Israel when compared to other countries in the West.

In summation of this section, a comparison of some of Israel's primary economic indicators to those in Western nations indicates that Israel has (until the time of this writing) weathered the global economic crisis better than other countries. However, narrowing the focus only to recent years – when the West is in its serious crisis, while Israel has emerged from its major crisis a decade ago – yields a picture that is far from an accurate socioeconomic reflection of Israel within a long-run comparative international perspective. Elements of this long-run picture will be provided in the following sections of this chapter, but first, a glimpse at some of the underlying symptoms leading to the social unrest that surfaced last summer.

2. *The Tip of the Iceberg: Israel's 2011 Summer Protests*

If the current economic picture is so bright in comparison with the West, as some of the earlier graphs would appear to indicate, then what brought 400,000 Israelis – in a country of under eight million – out into the streets one Saturday night in August in one of the most massive protests that the country has ever witnessed, a nation-wide protest characterized by several weeks of improvised tent cities on Israel's boulevards that were punctuated by smaller scale rallies? Different issues bothered different groups to varying degrees, and it was not just one primary problem that brought people together under the "social justice" umbrella that served as the slogan for the summer of 2011. The heads of the Taub Center's Policy Programs – all authors in this *Report* – published a manuscript titled *A New Public Agenda for Israel* (2011) last summer which documented the principal reasons underlying the protests and suggested a number of solutions. A sampling of some of these issues is provided here (issues such as inequality in incomes and services are addressed in other chapters of this *Report*).

Food Prices

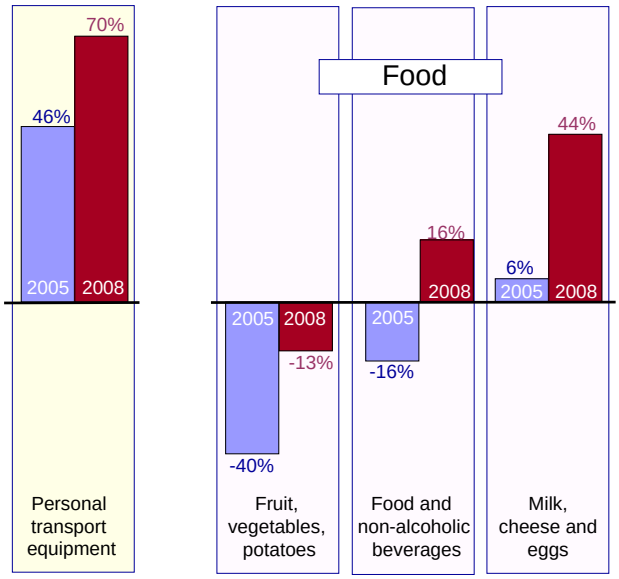
One of the catalysts that kicked off the summer protests was the price of cottage cheese – viewed by many as excessively high – together with a host of other dairy products considered overly expensive. One way to compare prices across countries is via the index of purchasing power parities, which compares the consumer prices of various baskets of goods around the world. The OECD calculated just such an index of price comparisons in 2005 and in 2008. While 2008 is not particularly recent, the changes in some of the categories since 2005 are quite revealing.

Figure 7 compares food prices in Israel with the OECD average. In the case of dairy products (milk, cheese and eggs), Israeli prices in 2005 were 6 percent higher than the average price in the OECD countries. By

2008, the price gap between Israel and the OECD had risen to 44 percent. One of the main causes for these differences is the limited competition that exists in Israel in the manufacturing and distribution of dairy products.

Figure 7

Prices in Israel relative to the OECD average*



* The difference between prices in Israel and the average OECD prices.

Source: Dan Ben-David and Nir Eilam, Taub Center.
Data: OECD purchasing power parity.

It is important to keep in mind that these comparisons reflect only price differences and do not account for differences in the standard of living. To the extent that living standards in the OECD are higher than those in Israel, then this would only magnify the differences highlighted in Figure 7.

The price of other food products and non-alcoholic beverages in Israel was 16 percent cheaper than in the OECD in 2005 and 16 percent more expensive in 2008. Agricultural produce was less expensive in Israel in both 2005 and 2008, but the gaps fell from 40 percent to 13 percent by 2008.

Chernichovsky (2011, and in the chapter "Israel's Healthcare System" in this report) provides evidence on how healthcare prices have substantially outpaced consumer price index growth. He also catalogues substantial growth in out-of-pocket medical expenses in Israel.

Prices of Vehicles and Housing

Two of the "big-ticket" items in any household budget are automobiles and housing. In the case of personal transport vehicles, Israeli prices exceeded the OECD average by 46 percent in 2005 and by 70 percent in 2008. Limited competition within Israel along with heavy taxes combined to yield this outcome.

In contrast with the price comparisons until now, the comparison of housing prices takes into account the income levels in the respective countries. A study conducted by Demographia focused on the number of median incomes that are needed to purchase the median housing in a number of different English-speaking countries.[4] Above 5.1 years of income was considered to be "severely unaffordable." As Figure 8 shows, it took 2.9 years of median income to purchase the median American home and 3.7 years to do so in Canada and Ireland. Housing is considerably more expensive in England (5.1 years), New Zealand (5.7 years) and Australia (6.8 years). In Israel, 7.7 years of median income are required to purchase the median apartment. In fact, the Israeli cost of housing – relative to income – is more expensive than housing in 32 of

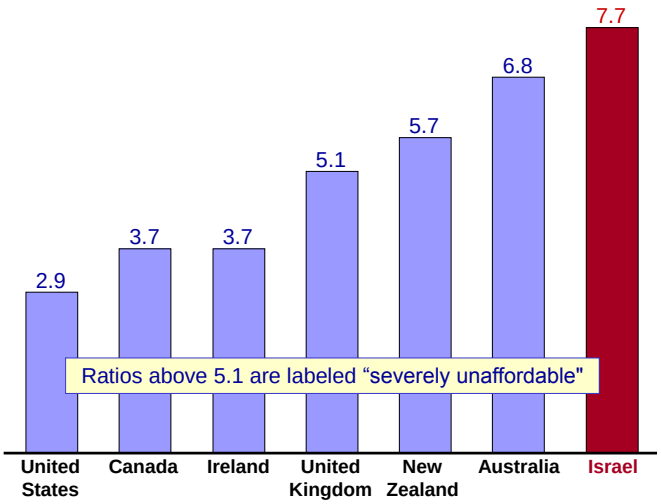
[4] When focusing on the median housing in each country, the focus is on the cost of the housing and no distinction is made between houses or apartments, nor does the study account for the size of the housing unit.

England's 33 metropolitan areas (including London) and more expensive than housing in 174 of America's 175 metropolitan areas (including New York City).

Figure 8

Number of years of work needed to buy a house, 2009

comparison of countries*



* Median house prices divided by annual median household incomes. The focus is on the representative housing price in each country rather than on specific housing characteristics (size, quality, etc.) that may differ across countries.

Source: Dan Ben-David and Nir Eilam, Taub Center.

Data: Demographia International Housing Affordability Survey.

There are a number of reasons commonly given for Israel's prohibitive housing prices. Among these is the country's Land Administration, which controls the government land (over 90 percent of the land in Israel) and operates inefficiently – to say the least – often as a

monopoly more intent on maximizing its profits than on improving the welfare of the residents. High demand for Israeli apartments by wealthy foreigners, who leave these apartments empty most of the year, is also considered by many to be a major cause of the high prices. These, among other reasons, are often cited as the primary causes for the very high housing prices in Israel.

As compelling as these reasons are – and they do indeed contribute to the problem that led so many young, middle-class Israelis into the streets to protest – they are really only a symptom of much more serious, endemic problems faced by Israeli society. It is, so to speak, just the tip of the iceberg – and it is this iceberg that warrants serious attention if the problems are to be treated at their source.

Not all housing in Israel is exorbitantly priced. There are outlying areas, in the geographic "peripheries" – as opposed to suburbs – where only a few Israeli want to live. Interestingly enough, the majority of these areas are not even far from a major city if one were to measure distance by air, but they are light years away in terms of the transportation infrastructure that physically connects them to the cities and also in terms of the quality of the majority of their schools. As a result, few people are willing to live in these areas and those who do so are primarily those who do not have a choice. Consequently, residents in the periphery have limited access to jobs and suffer economically, while their children have limited access to a good education and their socioeconomic mobility is impaired as they grow up.

Suppose, though, that the country invested heavily in these schools and in the transportation infrastructure that connects these areas to the cities. If schools there were at least as good as schools in the expensive cities, and if there were a fast, dependable and low-cost way to commute to the cities where the majority of the jobs are, then two of the primary problems facing young families would be solved – education for the children and employment for the adults. In light of Israel's very small physical size, the vast majority of its population lives in what should be no more than a 30-45 minute commute to a large city. Young families

would then be able to benefit from the low housing prices in these areas without sacrificing their children's education or their careers.

Not only would the immediate housing needs of young middle-class families be met, though. If there were better schools in areas that could now be called suburbs rather than peripheries, and if employment prospects were increased as a result of a vastly improved transportation infrastructure, then the residents of these outlying areas would benefit even more. Their children would now receive a good education and be afforded the chance to escape the impoverished conditions of many of their parents, and the parents would have increased access to employment and be able to improve their economic conditions.

In a nutshell, this is the iceberg: a very large proportion – a proportion that is steadily increasing – of Israel's population is not receiving either the tools or the conditions to work in a modern economy. As a result, the country has extraordinarily high rates of poverty and income inequality compared to other Western countries, and compared to itself in the past. In addition, there is a shrinking share of the population that is capable of assimilating new technologies and ideas and developing them further. Such a capability is a necessary condition for the productivity increases essential for expanding economic growth and moving Israel onto a new long-run growth trajectory that would reduce the differences in living standards between it and the leading economies. On paper, the government is indeed spending more on education and transportation, but as has been detailed in past *State of the Nation Reports* as well as in this chapter, there is a major issue of how much and how this money is spent.

3. The Iceberg: Israel's Primary Socioeconomic Challenges

As Ben-David (2003, 2010) has shown, Israel is situated on a number of very problematic long-run socioeconomic trajectories since the 1970s. The country has much higher rates of poverty and income inequality than it did in the past and these are higher than what most other Western countries experience today. Instead of continuing to catch up with the leading Western countries, as it did in the 1950s and 1960s, Israel's standard of living – as reflected by its GDP per capita – has been progressing along a steady and slow long-run path that is causing it to fall increasingly behind the living standards in leading Western countries (this despite relative gains in recent years as Israel emerged from its major recession a decade ago and the West entered its own serious recession).

The key underlying reason for these long-run phenomena is that a very large and growing segment of Israel's population is not receiving either the necessary tools or the proper conditions to work in a competitive global marketplace. Some of these problems will be highlighted here.

Productivity

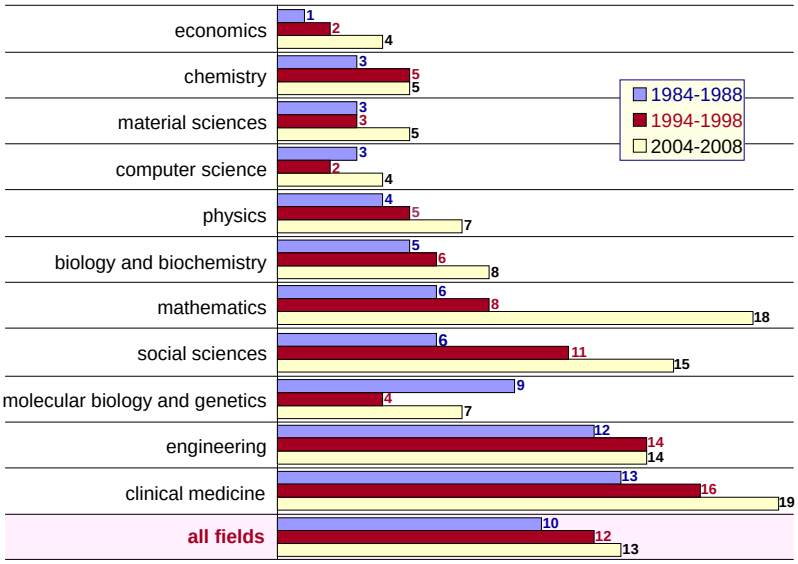
The principal element leading to economic growth is productivity. Productivity is driven by innovation, something that it would appear Israel is not lacking – either in the area of basic, academic research or in the business sector. A recent study by Uri Kirsh (2011) from the Technion highlights Israel's academic achievements in 11 important fields (Figure 9). In the fields of economics and chemistry, Israel was ranked in first and third place in the world, respectively, according to the average number of times that each of its academic articles was cited in the literature during the years 1984-1988. In addition, in the past decade, six Israelis have received Nobel Prizes in these disciplines. In all of the

fields analyzed, Israel was ranked 10th overall in the world. During the subsequent decade, there was a slight decline in most fields (and some improvement in the rankings of others) leading to an overall drop to 12th place in all fields. A further relative decline ensued in the past decade, with the country moving to 13th place overall. Even with the relative fall in recent decades, the number of citations of academic articles written by Israelis is still among the highest in the world – a very important indicator of originality and importance.

Figure 9

Israel's academic ranking in the world

according to academic citations by article in selected fields



Source: Uri Kirsh.

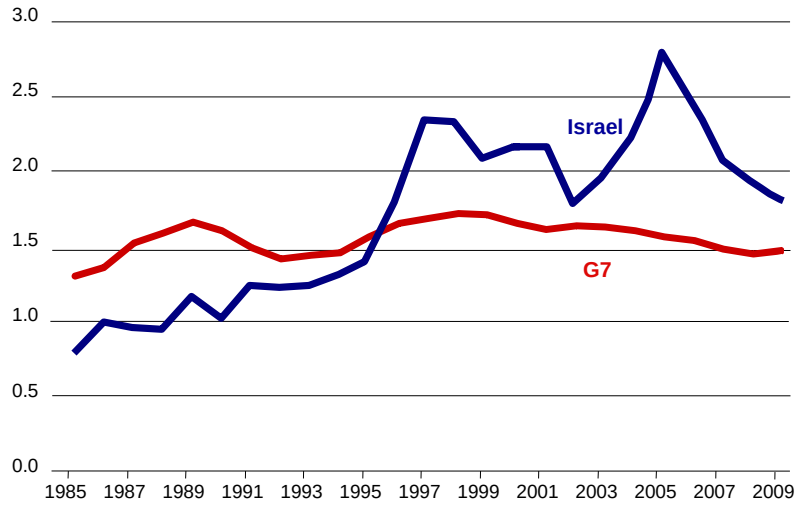
Data: ISI Web of Knowledge.

Innovation in the business sector is more difficult to quantify, but one indicator in this area is patents. Figure 10 shows the number of patents filed in the G7 countries and in Israel between 1985 and 2009. These are patents filed in all three parts of the triad – the United States, the European Union and Japan – and they are discounted by GDP in order to facilitate comparison across countries. As indicated in the figure, the number of patents filed (relative to country size, as reflected by GDP) from the leading G7 countries was considerably higher than the number of patents filed by Israelis in 1985. However, while the number of G7 patents filed over the next quarter century increased at the same pace as GDP in the G7, the number of Israeli patents increased more quickly, eventually surpassing the G7 in the latter half of the 1990s and remaining higher ever since.

Figure 10

Patents by Israel and the G7, 1985-2009

patents filed in all 3 parts of the triad*: US, EU and Japan
per 1 billion dollars GDP**



* Patents filed in all three constitute 20-30 percent of all Israeli patents.
** Constant 2005 dollars, by PPP.

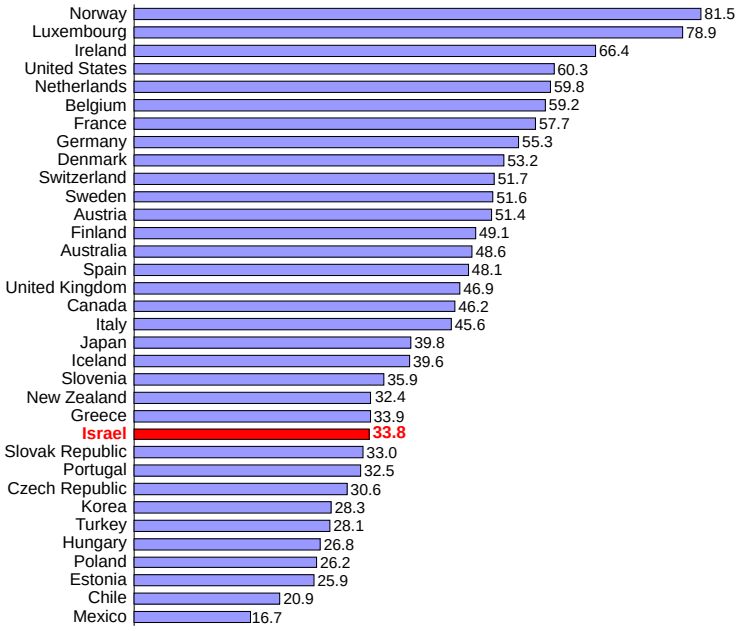
Source: Dan Ben-David, *State of the Nation Report 2009* (updated).
Data: OECD, World Bank.

So how is this relatively high level of Israeli innovation factoring into the country's productivity – and then into its living standards? Figure 11 suggests that the relation between the two is poor, at best. Labor productivity, which is defined by GDP per hour worked, is one of the more common ways to measure productivity in a country. In 2011, Israel's labor productivity was lower than the labor productivity in 23 of all 34 OECD countries.

Figure 11

Labor productivity, 2011

GDP per work-hour in 34 OECD countries, in dollars*



***** GDP per work-hour in current PPP adjusted dollars.

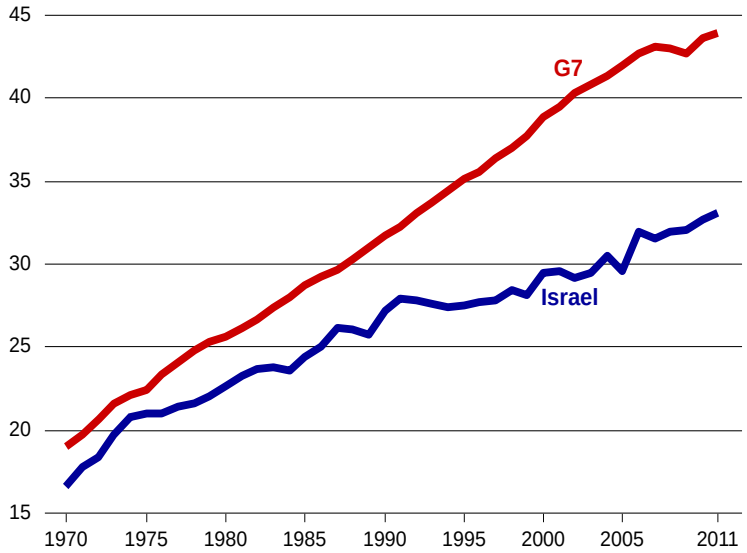
Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: OECD.

Things were not always this way. Figure 12, first shown in Ben-David (2010a) and updated here, shows labor productivity in the G7 countries and in Israel since 1970. Labor productivity in the G7 countries increased at a very steady pace for three and a half decades, slowing down in recent years with the onset of the massive recession in these countries. Labor productivity in Israel grew faster than the G7 average until the mid-1970s. Since then, however, Israel's productivity has been falling further and further behind in relative terms – and falling with it, in relative terms, is Israel's standard of living.

Figure 12

Labor productivity, 1970-2011

GDP per work-hour in 2005 dollars*



* GDP per work-hour in 2005 PPP adjusted dollars.

Source: Dan Ben-David, *State of the Nation Report 2009* (updated).
Data: Central Bureau of Statistics, Bank of Israel, OECD.

It should be pointed out that productivity is a measurement that applies only for individuals who are employed. Those who are not employed work no hours, do not contribute to GDP, and are therefore not included in either the numerator (GDP) or in the denominator (hours worked) of this measure. So the fact that fewer working age people work in Israel than in other countries only exacerbates the problem since living standards are reflected by GDP per capita.

A country's physical and human capital infrastructures are key in creating the productivity improvements necessary for economic growth. In the case of the former, the transportation infrastructure previously discussed in the context of housing prices is elementary and crucial. If people and trucks are stuck in traffic jams, then they are not working – and more are needed to produce the same output, with lower productivity as a result. As will be shown, Israel's roads are among the most congested in the Western world while the rail alternatives are even less developed.

As for the country's human capital infrastructure, Israel's education system is discussed further in this chapter. Suffice to say at this point that achievement in core curriculum subjects by the nation's children has been consistently below every one of the 25 relevant OECD countries since the late 1990s (Ben-David 2010a, 2011c), with all that this implies regarding the future ability of these children to compete as adults on the international economic playing field.

Employment

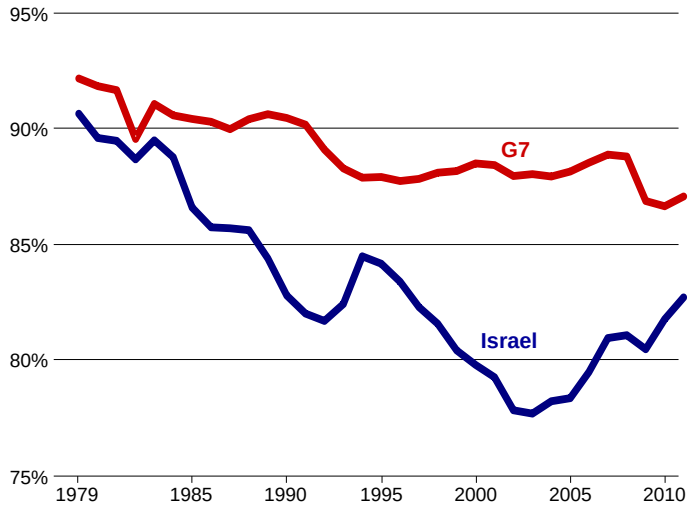
Not only is Israel falling behind the OECD in terms of productivity, it is also lagging in terms of employment among males (employment levels among women are below those of the OECD, but have been exhibiting a slight convergence in recent decades). While employment rates among men have been declining throughout the Western world (and employment rates among women have been rising), the decline has been much more severe in Israel.

Figure 13 shows just how much more severe the Israeli employment decline has been. The focus in this figure is on prime working age men aged 35-54 in the G7 countries and in Israel.[5] Just over three decades ago, in 1979, employment in both the G7 and in Israel topped 90 percent of the prime working age men. It then fell in the G7, until leveling off in the mid-nineties – and sharply falling in recent years with the onset of the recession in the West. Employment rates in Israel fell much more quickly and much further.

Figure 13

Male employment rates, 1979-2011

as percent of 35-54 year-old male population



Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: Central Bureau of Statistics, OECD.

[5] Due to compulsory military service in Israel, many men are still students in their mid to late twenties. In order to minimize this negative employment effect that is unique to Israel, the comparison here is for men between the ages of 35 and 54.

Despite a negative bubble in the early 1990s associated with the influx of immigrants from the former Soviet Union – who numbered about one-fifth of Israel's population – the recovery in the middle part of the decade was not to G7 levels but to the earlier downward trend. Another major negative bubble occurred in the early part of the last decade, with the onset of the *intifada* and the most serious recession that Israel has experienced in decades. This recession was followed by a substantial recovery in employment – one that accompanied the recovery in GDP per capita discussed previously and shown in earlier figures. Nonetheless, the gap in employment between the recovering Israel and the G7 in the depths of its recession is still considerably larger than the employment gap that existed over three decades ago.

Education has played a major role in determining Israel's rates of employment. The left panel of Figure 14 shows the extent of this. The figure distinguishes between prime working age men and women, Jews and Arab Israelis, and it differentiates between different levels of education to show how employment in each group has been affected by schooling. This analysis excludes the ultra-Orthodox (Haredi) Jews for whom education means something else entirely. In light of a curriculum severely lacking in core subjects in the Haredi schools, years of schooling do not have nearly the same relevance to the modern labor market as they do for the other groups.

When the focus is on relatively uneducated prime-working age Arab Israeli women, those with no more than 11 years of schooling, only 11 percent of these women were employed in 2011. The situation among relatively uneducated Jewish non-Haredi women and Arab Israeli men is better, though not particularly bright, with roughly two-thirds of them employed – and it is only marginally better for Jewish non-Haredi men of similar education levels.

All four of the groups exhibit substantial improvements in employment when the focus turns to individuals with a high school diploma.[6] The improvement in employment ranged from 13 percentage points for Jewish men, 16 percentage points for Arab[7] men, 18 percentage points for Jewish women, and 22 percentage points more for Arab women. Note that the lower the employment among a group's relatively uneducated members, the higher employment gains from the acquisition of a high school diploma.

An academic education reduces the employment inequality even more. Roughly 90 percent of all Jewish and Arab men and Jewish women with academic degrees were employed in 2011. And while employment rates for Arab women with academic degrees reached 79 percent, these are nonetheless in a different ballpark altogether than the employment rates for less-educated Arab women.

While the differences in employment rates across gender, population groups and education levels are substantial, not all employment is full-time. The right panel in Figure 14 provides an indication of how the groups differ in terms of the relationship between education and full-time employment. In this case, gender plays a much larger role than before. There is little difference between Jewish and Arab men with academic degrees (employment rates of 73 percent and 74 percent, respectively) and little difference between Jewish and Arab women with academic degrees (employment rates of 51 percent and 48 percent, respectively), but a substantial difference between men and women. The primary reason for this would probably be that in both societies, the primary care-givers for children are women – and the price that they pay in terms of full-time employment is shown quite clearly in the figure.

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[6] Graduating from high school in Israel implies successful completion of matriculation exams (called *bagrut* in Israel). There are several levels of the matriculation exams that are considered sufficient for receipt of a high school diploma, although not all of these levels are sufficient for gaining entrance into a university.

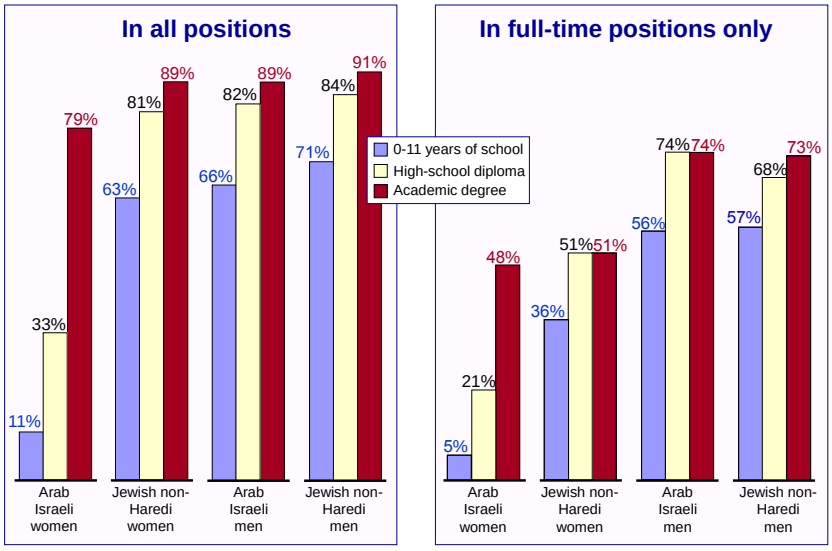
[7] The terms Arabs and Israeli Arabs are used interchangeably to refer to the same population.

When the focus is on full-time employment for women without academic degrees, large differences between Jewish and Arab women are in evidence (with much smaller differences between Jewish and Arab men). Among women who did not finish high school, only 5 percent of the Arab women are employed full-time, compared to 36 percent for similarly educated Jewish women. Full-time employment among Arab women who graduated from high school rises to 21 percent while rates of full-time employment among Jewish women who graduated with high school diplomas and academic degrees is identical – 51 percent for both.

Figure 14

Rates of employment, 2011

among 35-54 year-olds



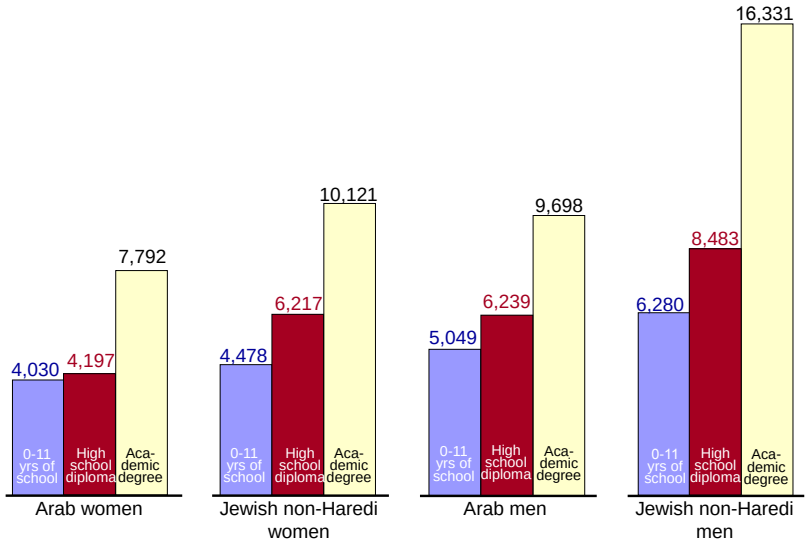
Source: Dan Ben-David and Eitan Regev, Taub Center.
Data: Central Bureau of Statistics.

As Kimhi shows in 2011 and 2012 (in this *Report*), differences in levels of education play a major role in determining wage gaps in Israel. This is clearly in evidence again in Figure 15, which continues the focus on prime working age Jewish and Arab men and women while concentrating on median monthly wages in full-time positions.[8]

Figure 15

Median monthly wages in full-time positions, 2010

35-54 year-old full-time salaried employees, NIS



Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

[8] The figure shows median wages. Average wages for each group appear in the appendix.

Those earning the least are the least educated. Arab women who did not complete high school and work full-time (remember, these are only 5 percent of all prime working age Arab women) earn a median wage of NIS 4,030 a month, just above the minimum wage (which was NIS 3,850 in 2010). Jewish women with a similar education who work full-time earn NIS 448 a month more and Arab men with 0-11 years of education earn an additional NIS 571. Jewish men with similar levels of education have a median income that is NIS 1,231 higher than Arab men.

Wage gaps between Jewish and Arab women rise to over NIS 2,000 a month for high school and academic graduates. Wage gaps between Jewish and Arab men rise to NIS 2,244 for high school graduates and to NIS 6,634 for individuals with academic degrees.

The bottom line is that a high school education leads to substantially higher wages for Jewish and Arab men, as well as for Jewish women – although less so for Arab women. An academic education provides an even larger step up in wages for each of the four groups. That said, the benefits of an education vary greatly.

Educated Jews make more than similarly educated Arabs, and this holds true for both men and women. Part of this undoubtedly has to do with discrimination in the Israeli job market against Arabs. That is not the entire story, though, nor may it even be the primary one. It makes a substantial difference what a person studies and where. It also makes a difference if the employment is in the private sector or in the public one, where wages are lower. Here there are substantial differences in the selection of professions and areas of specialization. Figure 16 provides some evidence of the variance in this regard. It shows the three most common employment branches for each of the groups, with the share of each branch out of the total employment for each group (the distribution of employment for all 15 classifications, by level of education, gender and sector, appears in Appendix 2). For example, of the prime working age Arab women with 0-11 years of education who work full time, 24 percent are employed in health and welfare services, 13 percent in trade, and another 13 percent in education. Together, these three employment

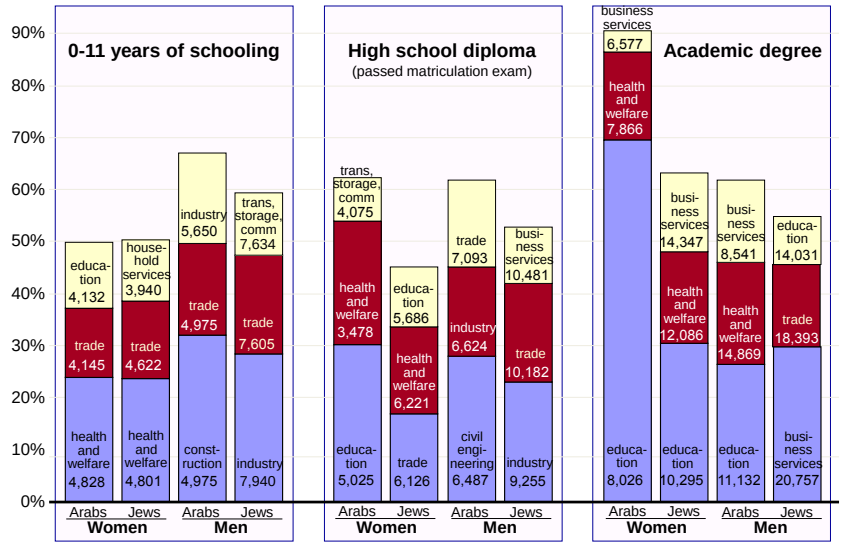
branches comprise 50 percent of the employment for this group of women. The average monthly wage for full-time employment in each of these branches is shown as well.

Figure 16

Three most important employment branches*

average wage of each group in each branch,**

by education, gender and sector, ages 35-54



* The share of the three most common branches out of each group's total employment, 2011.

** Average monthly wage from full-time employment (at least 35 hours/week), 2010.

Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

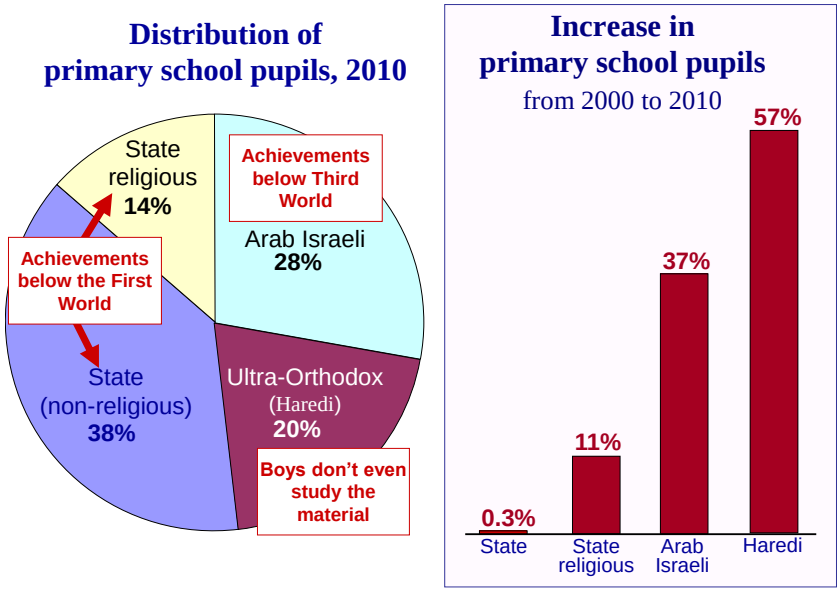
While the economic branches may be the same, the type of work done in each branch is clearly not going to be the same for individuals with different levels of education. For example, employment in the education branch for individuals with academic degrees invariably means teachers or managerial positions while employment in this same branch for individuals with 0-11 years of education is most likely in the area of maintenance – and the monthly wages reflect these differences. But this is also not a fine enough resolution to understand the wage differences between groups with the same education levels within the same economic branch. Continuing with the education example, not everyone works the same number of hours. In addition, while some of the work by the same individual may be in public sector schools, other work may be private (such as tutoring). Pay in the public sector education is also affected by whether the degree is a BA, an MA, or something else.

Even this, though, provides an incomplete picture. What one eventually studies in college – and which college one is able to get accepted to – is highly dependent on the quality of education that one receives in the pre-primary, primary and lower secondary schools. Here Israel is facing a major problem, especially when looking forward.

Education and Demography

The pie graph on the left-hand side of Figure 17 breaks up Israeli children into the country's four main education streams. Just over half of the primary school pupils (52 percent) studied in the State schools (both non-religious and religious schools). The average achievements of these children in mathematics, science and reading are below the average achievements in every one of the 25 relevant OECD countries (Ben-David 2011c). The education provided to Arab Israeli children – who comprise 28 percent of the primary school pupils – yields achievements below many Third World countries.

Figure 17



Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: Central Bureau of Statistics.

Twenty percent of Israel's primary school pupils are in the Haredi system. This system does not teach the core curriculum to boys beyond eighth grade and what is studied through eighth grade is minimal at best – no science or English for nearly all of the boys, and mathematics at a level that is nowhere near what children at their ages in other Western countries are studying. The situation for some of the girls is somewhat better, although this is far from uniform even for them.

A look at enrollment trends in the primary schools over the past decade is indicative of Israel's underlying demographics (bar graph on right-hand side of Figure 17). Between 2000 and 2010, there was almost no change (0.3 percent) in the number of pupils enrolled in the non-

religious State schools, and an 11 percent increase in the religious (though not Haredi) State schools. Enrollment in the Arab schools went up by 37 percent. In the Haredi schools, the number of pupils increased by 57 percent in the past decade alone.

In light of the fact that about half of today's children are either Arab or Haredi, and given achievement levels that are at best Third World and below, the current demographic changes reflect a socioeconomic evolution that will be unsustainable when these children grow up.

How poor is the Haredi school system in preparing its children for work in a modern economy? A glimpse at some labor market outcomes is quite revealing in this context.

As noted previously, the process of economic growth involves a continuous process of productivity improvements, and these involve an ever-increasing demand for educated, skilled workers – and a simultaneous decreasing demand (in relative terms) for less educated, unskilled workers. Consequently, while rates of employment for all levels of education exceeded 90 percent in 1970 (for men aged 35-54), the lower the level of education, the sharper the decline in employment over the next four decades (Ben-David 2011a).

Figure 18 shows the groups at each end of the education spectrum since 1979, those with 0-4 years of education and those with an academic education. In both cases, the figure distinguishes between non-Haredi Jews and Arab Israelis. The employment behavior of Jews and Arabs with an academic degree has been very similar over the past 33 years (the higher fluctuation among the Arabs is due to the small sample size of academically educated prime working age men) and it has stabilized at approximately 90 percent.

Employment rates of uneducated Jewish and Arab men have moved in tandem too – but in this case, the picture is one of a steady deterioration since the 1970s. These rates, which exceeded 90 percent in 1970, had fallen to around 80-90 percent by 1979, the first year shown in this figure, and continued to fall to around 30-40 percent rates about half a decade

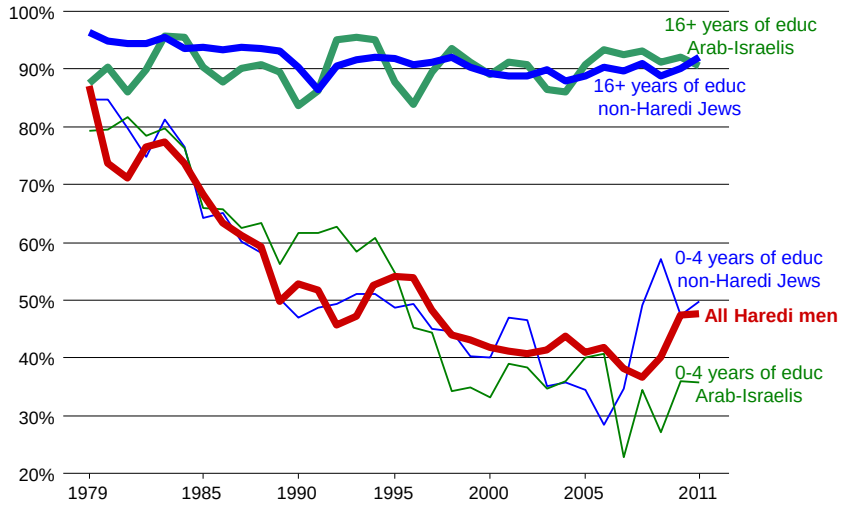
ago, with a slight improvement among Jews in recent years as Israel has moved out of the *intifada* and recession period.

What about prime-working age Haredi men? As noted previously, they do not study any core curriculum subjects beyond eighth grade. But even what they do study is at such a poor level that their rates of employment – for all years of study, since the number of years of Haredi schooling matter little when it comes to receiving the basic education needed for working in a modern and competitive economy – closely mimic the rates of employment among the least educated non-Haredi Jews and Arabs Israelis for the past 33 years (Figure 18). These are the employment opportunities that the Haredi education system provides their boys.

Figure 18

Male employment rates, 1979-2011

35-54 year-olds



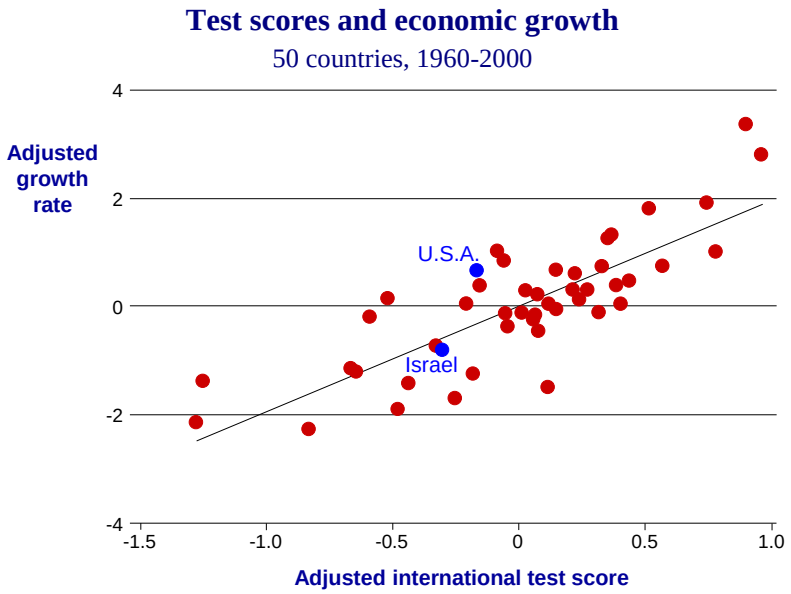
Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

The issue of the quantity of education – that is, years of schooling – and the quality of education extends far beyond its importance in the Haredi context. While the quantity of education has repeatedly been shown to be highly related to economic outcomes for the individual – and for the nation (see, for example, Mankiw, Romer and Weil 1993 and Barro 1991), increasing evidence has been accumulating on the vital importance of the quality of education.

Hanushek and Woessmann (2010) show how achievement in core curriculum subjects – mathematics, science and reading – in 50 countries over 40 years has been strongly correlated with differences in national rates of economic growth (Figure 19). When applied to Israel, their calculations suggest that had the country's achievement levels in the core subjects yielded a national score 50 points higher since 1980 (which is roughly the gap between the OECD average level of achievement and the Israeli level), Israel's rate of economic growth in per capita GDP would have been higher by 0.44 percentage points in 2010.

Figure 19



Source: Eric A. Hanushek and Ludger Woessman, presented at Taub Center International Conference on Education (2011).

In other words, instead of continuing along the current growth path that has taken Israel further and further behind the leading Western countries, Israel could have been closing the gap. In 2010 alone, another 41 billion shekels (approximately the size of the country's entire domestic defense expenditures)[9] would have been added to Israel's GDP – had the country improved its education system (Ben-David 2011b). It is hard to overemphasize the socioeconomic implications of what this gap has cost Israel and what those resources could have enabled it to do.

Evidence on the importance of the quality of education is accumulating at the individual level as well. Chetty, Friedman, Hilger, Saez, Schanzenbach, and Yagan (2011) show that high quality classroom environments between kindergarten and third grade led to higher rates of academic education, higher incomes and homes in better neighborhoods a couple of decades later. Chetty et al. raise the possibility that differences in the quality of education perpetuate income gaps when these children grow up. Chetty, Friedman, and Rockoff (2011) estimate that income correlations between one generation and the next would have fallen by one third had the children in their sample been learning in schools with similar quality levels.

How does a country improve the quality of its education? A number of claims have repeatedly been made in Israel regarding the reasons underlying its children's poor achievements on international exams – among these, too few instruction hours, classrooms with too many pupils and insufficient resources.

Figure 20 provides a comparison of 24 OECD countries to Israel in terms of the number of instruction hours and in terms of achievement in the most recent PISA international exams in mathematics, science and reading in 2009. Overall, the average number of instruction hours in these OECD countries was 14 percent below Israel's, while their average achievement level was 8 percent higher. More specifically, in 19 of these

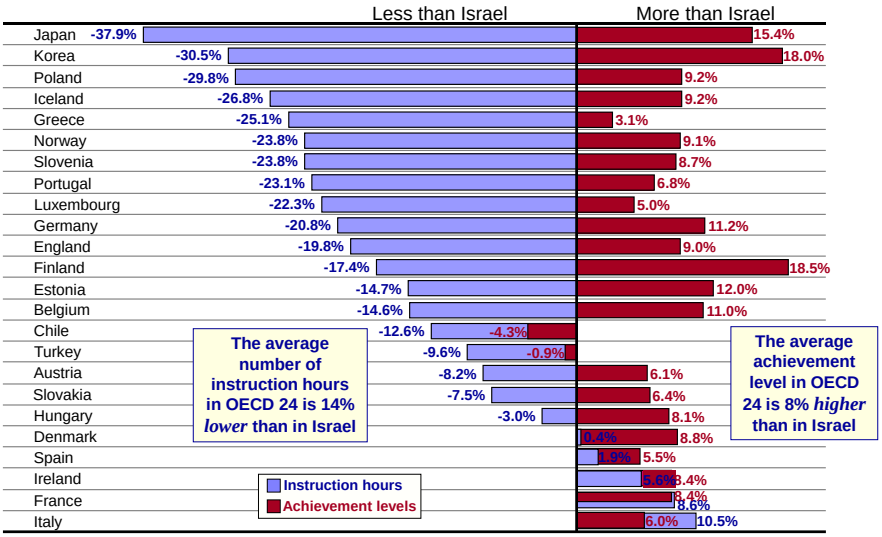
[9] Domestic defense expenditures equaled NIS 43 billion in 2010 (data from the Bank of Israel).

countries, pupils were provided with fewer instructional hours than the children of Israel. However, in 17 of these 19 countries, levels of achievement were higher than Israel's.

Figure 20

Instruction hours and achievement*, 2009

24 OECD countries relative to Israel

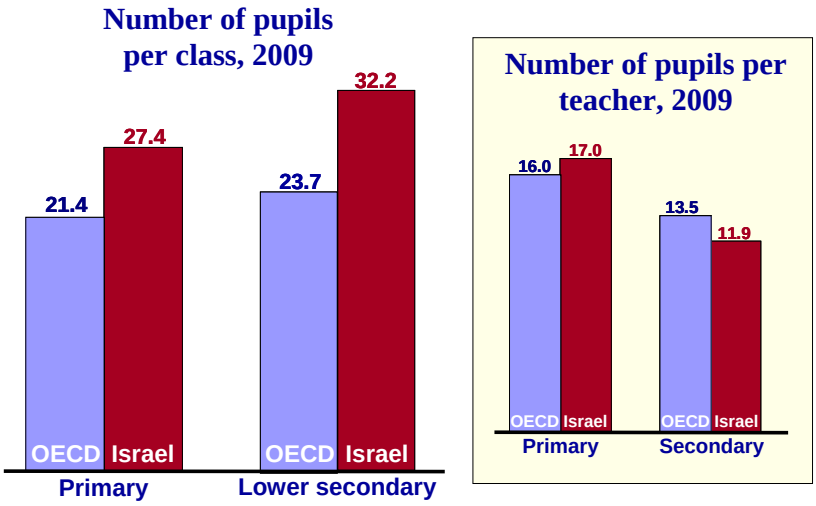


* Cumulative number of intended instruction hours for 7-15-year-olds and average achievement levels in math, science and reading in PISA 2009.

Source: Dan Ben-David, *State of the Nation Report 2009*, (updated).
Date: OECD, PISA.

Class sizes were indeed larger in Israel than in the OECD that year (Figure 21). In Israel's primary school system there were 27.4 pupils per class, compared with an average of 21.4 in the OECD. In lower secondary schools, the gap was even larger: 32.3 pupils sit in the average Israeli classroom while only 23.7 are in the average OECD classroom.

Figure 21



* According to full-time equivalents.

Source: Dan Ben-David, *State of the Nation Report 2009* (updated).
Data: OECD.

The question is, why is this so? After all, the number of pupils per teacher (in terms of full-time equivalents) in Israel's primary school system (17.0) exceeded the OECD number by just one pupil. In secondary schools, there are actually fewer children per teacher (11.9) than the OECD average (13.5). So why are Israel's classrooms so full? Part of the problem – as has been pointed out in earlier *State of the Nation Reports* – is in the interpretation of the numbers.

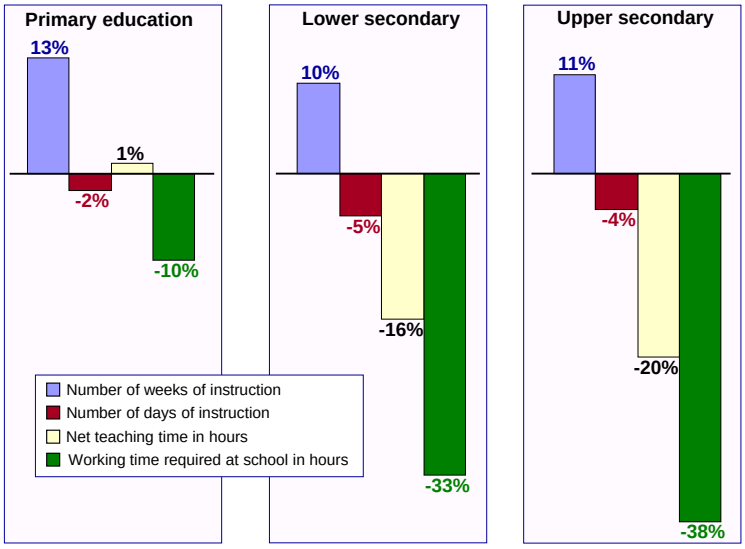
Figure 22 shows a variety of measures of teachers' working time over the school year. In all three levels of education – primary, lower secondary and upper secondary – the number of weeks of instruction in Israel is 13 percent, 10 percent and 11 percent higher (respectively) than in the OECD. On the other hand, the number of days of instruction in all

three levels of education is 2 percent, 5 percent and 4 percent (respectively) lower in Israel than in the OECD.[10]

Figure 22

Teacher's working time over the year*

percent difference between Israel and OECD average, 2009



* In public institutions.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: OECD, PISA.

[10] Nachum Blass contends that the OECD data on the organization of teachers' working time regarding the number of weeks of instruction and number of days of instruction in Israel is incorrect. He states that Israeli teachers work fewer weeks and more days per year than the OECD lists. So, while division of total days per year by total weeks per year on the basis of the OECD data yields work weeks of 4.9 days in the OECD and 4.2 days in Israel, Blass's numbers yield the work weeks for Israeli teachers that are 6 days in length. While pupils go to school 6 days a week in Israel, the teachers' work week is less than 6 days, so there appears to be a discrepancy in the Blass numbers. In any event, there is no argument regarding net teaching time in hours and working time in school in hours.

While net teaching time in hours over the school year is roughly the same in primary schools (1 percent more in Israel), it is substantially less in lower secondary schools (by 16 percent) and in upper secondary schools (by 20 percent). In fact, the number of hours that teachers are required to work in Israeli schools is 10 percent below the OECD average in primary schools, 33 percent lower in lower secondary schools, and 38 percent lower in upper secondary schools.

In light of the very problematic long-run socioeconomic trajectories that Israel is situated on and given the future socioeconomic implications of the current state of the country's education system, it is important to emphasize the need for education reform in the country. Previous publications by the Taub Center have detailed many of the aspects that such reform must include while the chapter by Blass, Blank and Shavit in this *Report* ("A Vision and Set of Recommendations for the Israeli Education System") focuses directly on this issue. Suffice to say that education reform must focus on three primary issues: what the children are studying, who is teaching the children and how the education system operates.

Israel's Transportation Infrastructure

A. Roads, Trains and Investments

Whether the focus is productivity, income inequality, housing, or a host of other serious challenges facing Israel, one common underlying theme connecting all of these is the very problematic state of some of Israel's basic infrastructures. The human capital infrastructure, education, was discussed above. A very central part of the physical infrastructure – transportation – is the focus here.

Nearly a decade ago, Ben-David (2003b) discussed the state of Israel's transportation infrastructure together with its socioeconomic effects. This was an infrastructure that was neglected for decades on end by government after government. To a certain extent, that neglect has been replaced by considerably higher investments over the past decade.

Nevertheless, these investments and the current state of the infrastructure need to be put in perspective.

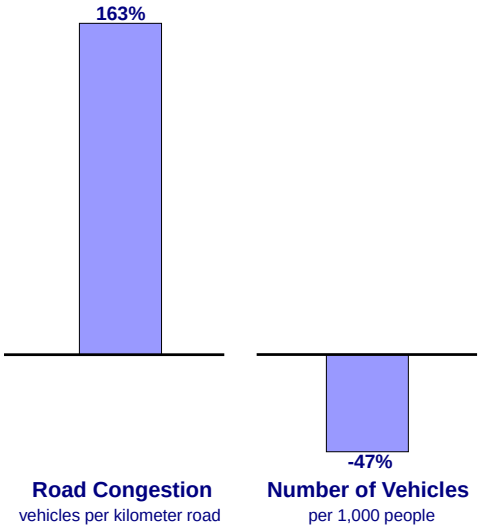
The congestion on Israel's roads is over two and a half times the OECD average; the number of vehicles per capita is about half the OECD average (Figure 23). As shown in Appendix Figure 1, Israel's roads are far more crowded than the roads in every one of the 22 OECD countries in the graph except for Korea, which is even more congested than Israel. On the other hand, as indicated in Appendix Figure 2, Israel has considerably fewer cars than all 22 of the OECD countries in the graph. To the extent that Israel manages to close the gap in standards of living between itself and the wealthier OECD countries (not a given, in light of some of the evidence provided in this chapter), it stands to increase substantially the number of vehicles per capita – with very clear implications regarding the already heavy congestion on the country's roads.

In fact, the situation is considerably worse. Since rail transport is much more developed in most of the other OECD countries, there are more alternatives in those countries to cars and trucks. In other words, in the absence of viable rail options available in other Western countries, there is no reason to assume that the number of vehicles in Israel should merely double to the OECD average as Israel's income per capita rises to OECD levels.

Figure 23

Situation on the roads

Israel relative to OECD average*, 2008



* Average of 22 OECD countries.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: World Bank.

How poorly developed is Israel's rail system? Appendix Figure 3 shows the number of passenger-kilometers per person in the OECD, with Israel (0.26) having about third of the OECD median country, Sweden (0.76). Regarding the transporting of freight on rail, the picture is similarly problematic, as is shown in Appendix Figure 4. In this case, ratio of freight tonnage to GDP in Israel is about one quarter that of the median OECD country, France.

The problem with the above comparisons is that they include very large countries with huge expanses of land – while Israel is extremely small in size. A better comparison would be to the small developed countries of the OECD. The bottom left panel of Figure 24 shows that

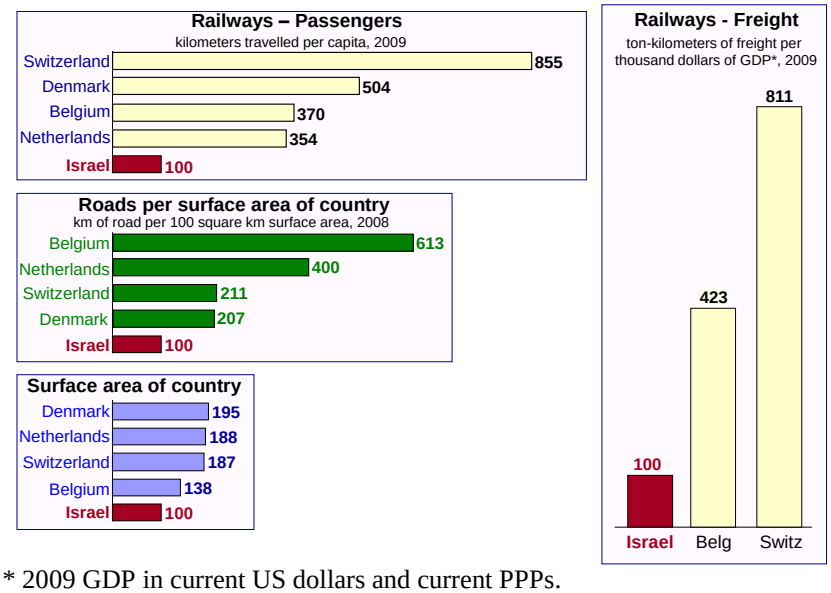
while these countries are small, they are nonetheless larger than Israel: the surface area of Belgium is 38 percent larger than Israel, Switzerland is 87 percent larger, the Netherlands 88 percent, and Denmark 95 percent larger.

That said, the amounts of roads per surface area in these countries are substantially larger than in Israel (middle left-hand panel of Figure 24). These differences range from 107 percent more roads per surface area in Denmark to over 6 times more road per surface area in Belgium.

Figure 24

Transportation infrastructure

in Israel and small European countries, Indices: Israel=100



* 2009 GDP in current US dollars and current PPPs.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: World Bank.

When the shift is to rail, the gaps in passenger-kilometers per person (top left-hand panel of Figure 24) are even greater – ranging from 3.5 times the Israeli number (in the Netherlands) to 8.6 times the number (in

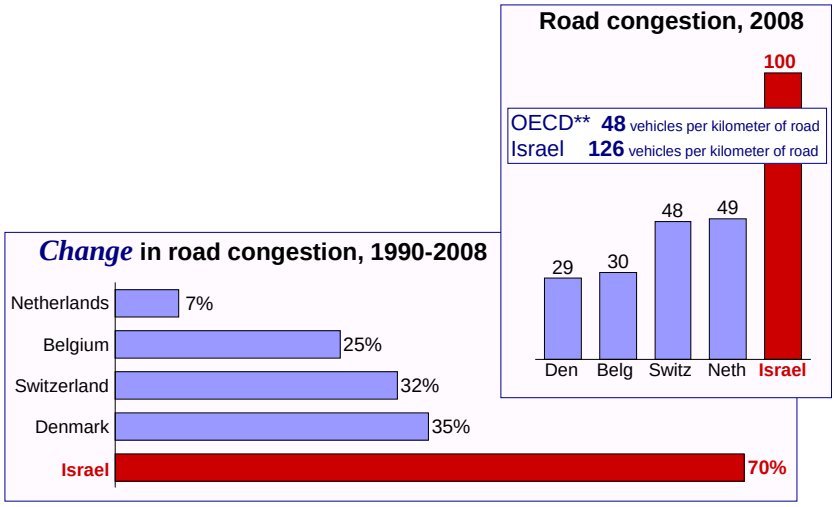
Switzerland). Only two of these other countries provide data on millions of tons of freight, but these differences are similarly large. The ratio of tons per kilometer to GDP in Belgium is 4.2 times the number in Israel while the comparable multiple is 8.1 times Israel for Switzerland.

Hence, it is not surprising that the paucity of alternatives drives Israelis to the roads – literally. The increase in road congestion between 1990 and 2008 among the smaller European countries ranged from 7 percent in the Netherlands to 35 percent in Denmark (horizontal panel of Figure 25). In Israel, road congestion rose by 70 percent during this period. Consequently, road congestion in the Netherlands is 49 percent of the congestion in Israel while the Danes have only 29 percent of the Israeli road congestion (vertical panel of Figure 25).

Figure 25

Congestion on roads*

in Israel and small European countries, Indices: Israel=100



* Vehicles per kilometer of road.

** 22 OECD countries.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.

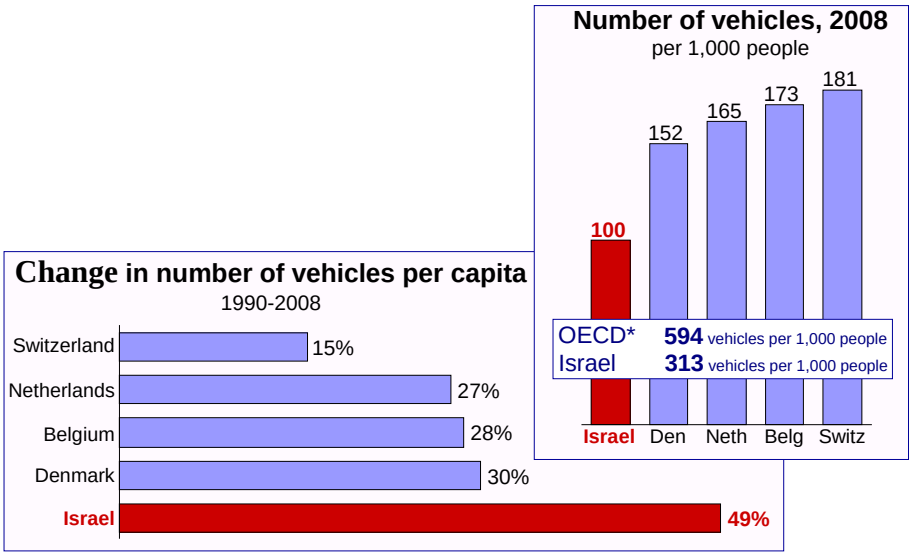
Data: World Bank.

The lack of transportation alternatives has led Israelis to buy many more cars as well. While the inhabitants of the smaller European countries increased the number of vehicles per capita by 15 percent (Switzerland) to 30 percent (Denmark) between 1990 and 2008, the number of vehicles in Israel increased by 49 percent during the same period (horizontal panel of Figure 26). Israel's standard of living is below that of the smaller European countries, so there are currently more vehicles per capita in those countries – between 52 percent more in Denmark to 81 percent more in Switzerland (vertical panel of Figure 26).

Figure 26

Vehicles per capita

in Israel and small European countries, Indices: Israel=100



* 22 OECD countries.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: World Bank.

The end result of the comparison of Israel with the Western countries is quite problematic. In the absence of even remotely comparable rail alternatives, Israelis are buying more and more cars; and in the absence of an adequate road infrastructure, the congestion on the country's roads is already substantially greater than the congestion in the West. As incomes in Israel rise, this situation on the roads can only be expected to deteriorate – with all of the attendant economic and social consequences.

In recent years, Israeli governments have finally begun a concerted effort to rectify this problem. However, even with the much larger infusion of resources into the country's transportation infrastructure – a very large part of it from private sources – the national expenditure (i.e. public and private together) is still not at levels that are sufficient to close the existing gaps.

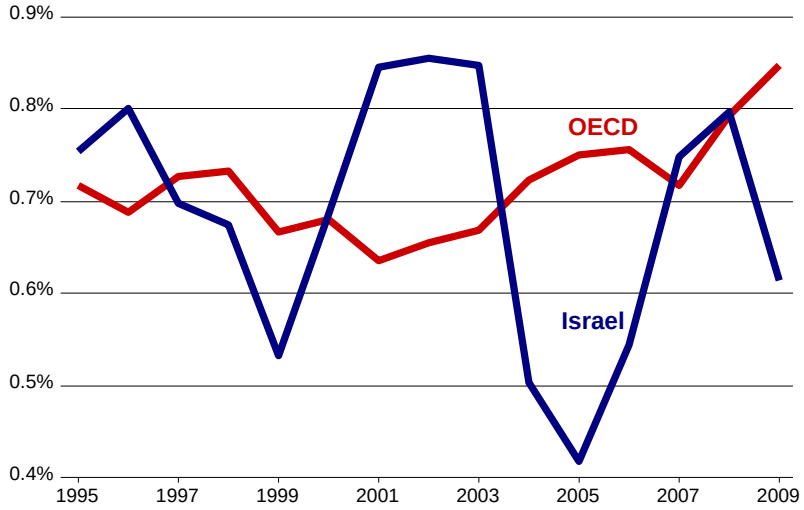
Figure 27 compares national spending on roads in Israel to the OECD average as a share of GDP. This spending has been particularly volatile in comparison with the OECD. Between 1996 and 1999, road expenditure as a share of GDP fell sharply, from 16 percent above the OECD ratio in 1996 to 20 percent below the OECD in 1999. A steep increase in spending began in 2000, reaching 33 percent more than the OECD in 2001. It leveled off in 2002-2003, then plunged from 0.85 percent of GDP in 2003 to 0.50 percent in 2004, continuing to fall to 0.42 percent in 2005 – just over half of the amount spent on roads in the OECD (0.75 percent GDP). A turnaround occurred in 2006, with Israeli levels of spending returning to OECD levels (that had been slightly increasing over the past decade) by 2007 and 2008. In 2009, as OECD expenditures on roads continued to rise, they fell by almost one-quarter in Israel, with Israeli spending decreasing to 27 percent below the OECD.

Two main issues surface from this figure. The first is the extreme volatility in Israeli spending on roads. Those familiar with the Israeli political scene may notice how closely the turnaround years reflected changes in Israeli governments – with the spending on roads very strongly reflecting the national priorities of the country's various governments.

Figure 27

National investment on roads

as percent of GDP



Source: Dan Ben-David and Nir Eilam, Taub Center.

Data: International Transport Forum, Central Bureau of Statistics.

The second issue is that, with the exception of just a few years at the beginning of the last decade, overall spending on Israeli roads has been close to OECD spending, at best, and far below it in other years. It should be remembered that the OECD road expenditures primarily reflect maintenance costs while Israel's spending still needs to include creation of the type of infrastructure that the OECD already has.

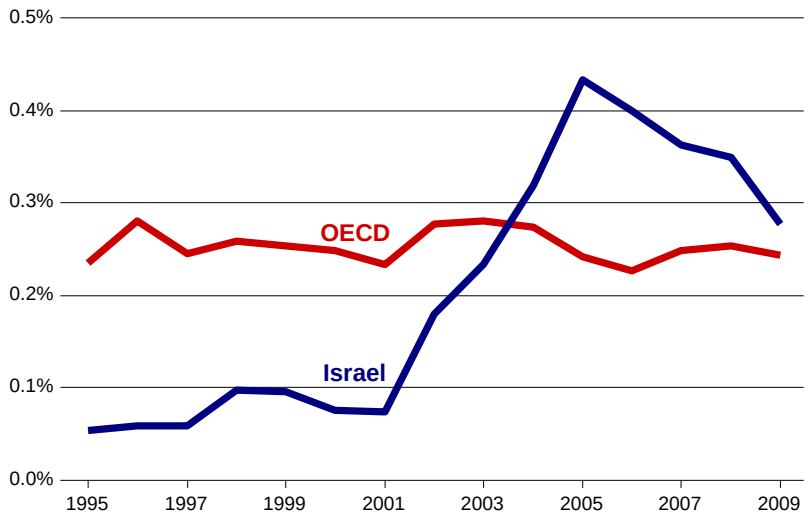
Figure 28 provides a comparison of Israel and the OECD in the realm of rail expenditures. In this area, underinvestment in Israeli rail infrastructure ranged from roughly 80 percent below the OECD in the mid-1990s to just under 70 percent less in 2001. In 2002, at the height of the *intifada* and major recession, investment in rail increased by a factor

of 2.4 (compared with the amount spent in 2001). There were further increases, in real terms (i.e. net of inflation) of 26, 37 and 38 percent in 2003, 2004 and 2005, respectively. The result, as readily evident in Figure 28, was a steady increase in the ratio of railroad expenditures to GDP, peaking at 79 percent more than OECD levels – a major effort at reducing the infrastructure gap between Israel and the OECD.

Figure 28

National investment on rail

as percent of GDP



Source: Dan Ben-David and Nir Eilam, Taub Center.

Data: International Transport Forum, Central Bureau of Statistics.

Since then however, spending on rail was cut in each of the years since 2006. By 2009, the share of infrastructure spending on Israeli railroads out of GDP fell to just 14 percent above the OECD average. In light of the vast differences that continue to exist between Israel and the OECD in terms of available rail alternatives to roads, the steady decline in rail investment does not indicate that these gaps will be falling in a major way anytime soon to relieve the congestion on Israel's roads.

B. Toll Roads

One way that Israel has adopted to relieve pressure on public resources in funding the construction of roads has been the extensive use of private investment. The construction of what has become the country's primary north-south artery, Route 6, has relieved some of the pressure on the roads in the central part of Israel – a geographic bottleneck that houses the largest metropolitan area, Tel-Aviv and its surroundings. This was a build-operate-transfer (BOT) project that was primarily privately funded. The rising congestion on this road has led to its widening in recent years, even before completion of its northernmost and southernmost sections.

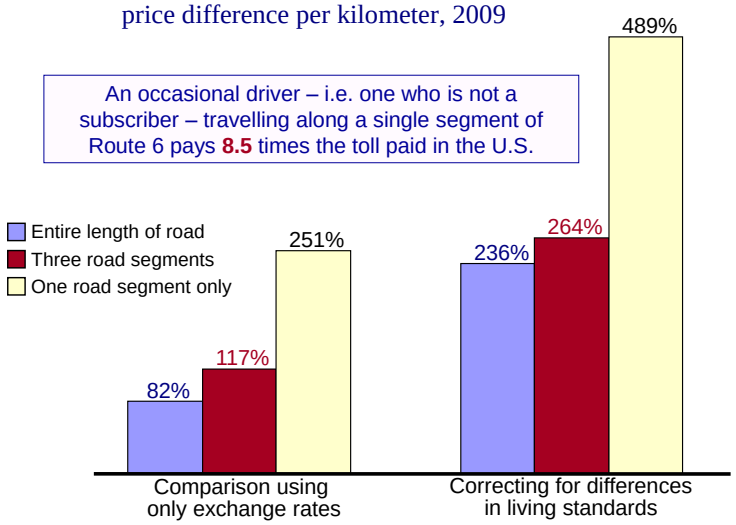
As shown in Ben-David (2005), tolls on this road were substantial when compared with major toll roads in the United States. The comparison initiated by Ben-David (2003b and 2005) was redone by Ida and Talit (2010). Figure 29 shows that the cost of driving on Route 6 is still substantially higher in Israel.

Israeli pricing is for the first three segments driven on the road, with no additional costs for the fourth segment and beyond. Discounted rates in Israel for driving the entire length of the toll road are 82 percent higher per kilometer than discounted rates in the US. The cost of driving three segments in Israel is more than twice the cost in the US, while the cost of one segment is 3.5 times greater than the American cost. This comparison reflects a simple translation of the cost into US dollars and does not take into account the fact that incomes are substantially higher in the US than in Israel.

Figure 29

Tolls on Route 6 relative to US tolls*

price difference per kilometer, 2009



* Comparison of Paskal discount rate (for subscribers) to discount rates on toll roads in New York, New Jersey, Pennsylvania, Ohio, and Florida.

Source: Ida and Talit (2010).

When living standards are considered (specifically, discounting tolls by GDP per capita in the two countries), the gap between the two countries turns out to be considerably higher. The standardized cost of travelling the entire length of Israeli toll roads is 3.4 times the standardized cost in the United States. The standardized cost of travelling just one section is 5.9 times greater in Israel – and this is a comparison of the discounted rates in the two countries. An occasional driver who is not a subscriber to the toll roads pays 8.5 times more in Israel than in the US.

This is one way to fight congestion on the roads, but the dearth of viable alternatives to the car in Israel invariably means that residents must take to the road and bear whatever costs are placed on them. The outcomes are not surprising. One way to try and evade these costs, at least on a daily commute basis, is to live in the big cities – providing yet additional upward pressure on housing costs there, as shown earlier in this chapter.

The bus alternative used to be the primary means of transportation in the younger and poorer Israel of the 1950s and 1960s. As the country's living standards rose and more cars were purchased, the increasing congestion on the roads made travel by bus even more time-consuming and inconvenient. So while fares are subsidized, time costs are not; and increasingly, the public's choice has been away from buses.

Traffic lanes have been somewhat helpful in expediting the movement of buses, but these have come at the expense of lanes on the already narrow and congested city roads. This has not only made life more difficult for motorists, it has also lead many to ignore the restrictions on the public transportation lanes and, in the absence of adequate enforcement, the result has been a hampering of bus travel and a further reduction in its attractiveness.

One alternate way to reduce congestion on the roads – in the absence of sufficient rail options – is to increase the cost of driving. The toll roads have done this well. But these are not the only options for governments with national priorities that do not provide sufficient resources for building viable transportation alternatives.

The next section focuses on the relatively high cost of gasoline in Israel, a source of considerable discontent in recent years. If the strategy is to move people away from cars to alternative modes of transportation by raising the cost of gasoline, then there is a need for adequate alternatives in this realm to be provided. Since the investment in such alternatives has been considerably below what is needed, then it does not appear that the policy of driving up gasoline prices in Israel is related to such a strategy.

C. Gasoline Prices

- ***Changes over time***

The price of gasoline in Israel has become the focus of considerable public attention over the past year, with the price of a liter of gasoline reaching NIS 8 per liter (or about 1.36 Euros per liter) by early April 2012. Since the number of liters per gallon (3.785) is roughly equal to what was then the number of shekels per dollar, the equivalent, in American terms, would be about $8 per gallon of gasoline.

Whether or not the Israeli price is high depends on the countries of reference. It also depends on a number of additional factors and reference points – with several of the more important factors missing from the public discussion.

The primary reason for the large increases in gasoline prices in recent years has been the price of oil. Twenty-five years ago, in the spring of 1987, the cost of a barrel of Brent crude oil was around $19. The oil price roller coaster peaked at $144 two decades later, in July 2008, only to plummet to $34 by December of that year. Within the subsequent three years, the price of Brent crude oil has risen almost four-fold to $124 by March 1, 2012.

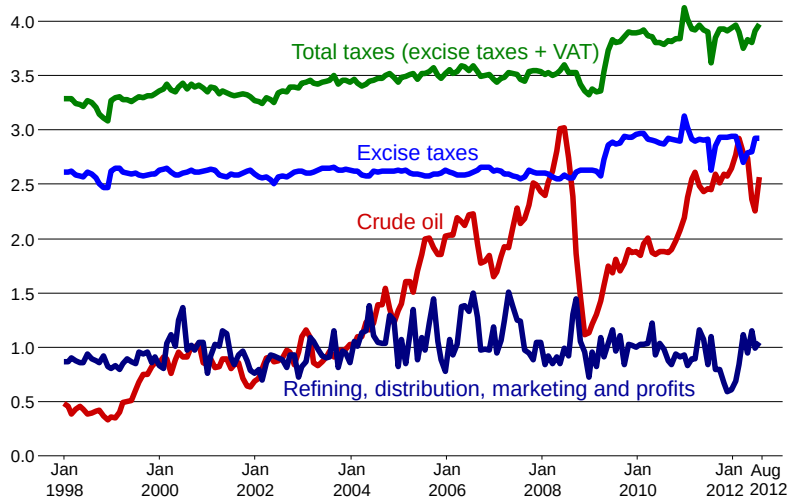
Figure 30 decomposes the primary components in the shekel cost of a liter of Israeli gasoline and shows how these have changed over the past decade. Interestingly enough, while oil prices have contributed the most to fluctuations in the price of Israeli gasoline, they are not the largest cost component.

Two kinds of taxes are imposed on gasoline. The first is an excise tax. In addition, there is a 16 percent value added tax (VAT) that is levied not only on the cost components of a liter of gasoline, but also on the excise tax itself, effectively compounding the overall tax impact. From the government income perspective, the major advantage of the VAT is that it is proportional – so when the price of oil rises, so do government revenues.

Figure 30

Gas price components in Israel, 1998-2012

price per liter, 95 octane, in 2011 shekels



Source: Dan Ben-David and Yulia Cogan, Taub Center.

Data: Central Bureau of Statistics, Ministries of Finance, Energy and Water Resources, Bank of Israel, OECD

Excise taxes of about NIS 2.5 per liter (in 2010 prices) remained relatively constant – and much higher than the quickly rising oil prices – during the latter part of the 1990s and the early part of the subsequent decade. No attempt was made by the government to mitigate the spiraling cost of oil with even partially offsetting declines in taxes. In fact, the proportional attributes of the VAT had the opposite effect. The higher the price of oil, the greater the government revenues from the value added tax – ensuring that at all times, the total amount of taxes levied on each liter of gasoline always exceeded the price of oil, even when oil prices were at their peak.

Ironically, although the excise tax remained almost unchanged as oil prices shot up, it did not continue to remain constant when oil prices fell during the latter half of 2008. Instead, the Israeli government decided to increase its excise tax by 10 percent in May 2009 – which of course also meant an automatic built-in increase in value added tax income for the government from the excise tax increase. A year and a half later, in January 2011, the government decided to implement a further 8 percent increase in the excise tax, to NIS 3.03 per liter (in 2010 prices), an increase that remained in place for just two months before returning to the pre-January 2011 levels.

Extensive public protests in the summer of 2011 – on a host of socioeconomic issues, including the price of gasoline – led the government to temporarily reduce the excise tax by 10 percent in August. This reduction was meant to calm the protests and the short-lived change in policy was reversed almost immediately after the protests died down. Within two months, by October 1, 2011, the excise tax was back up to NIS 2.83 per liter (in 2010 prices).

Over the 14 years between January 1998 and August 2012, as the price of crude oil rose more than four-fold in real terms, no effort was made to reduce the overall tax burden on the economy in order to relieve it from some of the resultant effects of higher production costs and living expenses. In fact, total taxes per liter rose by 21 percent in real terms during this period – with income from VAT rising by 56 percent in real terms despite a slight reduction in the value added tax rate from 17 percent to 16 percent. The primary tax, the excise tax, exceeded the price of oil during nearly all of this period – rising by 12 percent in real terms since 1998.

A glimpse at what occurred between July 2008 and Sept 2012 provides a sense of what underlies much of the discontent among Israeli consumers. As shown in Figure 31, the dollar price of the crude oil component in a liter of gasoline fell by $0.15. A devaluation in the Israeli shekel during this period meant that the NIS price of the crude oil

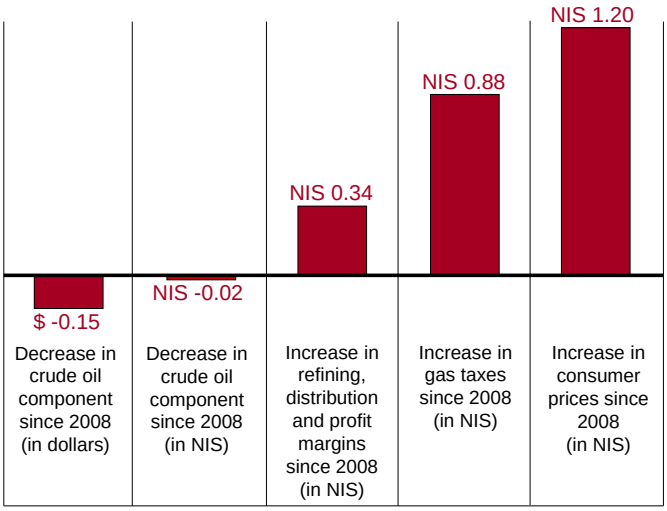
component in Sept 2012 was nearly identical (it was NIS 0.02 less) to what it had been four years earlier.

Despite the fact that oil prices remained relatively unchanged, the price of a liter of gasoline to Israeli consumers increased by 18 percent, or NIS 1.25. This was due primarily to an increase of NIS 0.88 in gasoline taxes and a NIS 0.38 increase in the margins going to refining, distribution, marketing and profits.

Figure 31

Sources of increase in the consumer price of a liter of gasoline in Israel

July 2008-September 2012*



* Forecast for September 2012 from the Ministry of Finance.

Source: Dan Ben-David and Yulia Cogan, Taub Center.
Data: Ministry of Finance, US Department of Energy.

- ***Comparison with other countries***

Do Israelis pay more for their gasoline? An international comparison with OCED countries from Western Europe, North America, and Oceania indicates that the consumer price of a liter of gasoline in Israel in the year 2011 ($2.00), was greater than the price of gasoline in 18 of the Western countries and lower than the price in the three other countries (Table 1).

Higher oil prices, and the resultant high energy prices, impose a heavy burden on those with lower incomes and on poorer countries. While oil is sold at internationally arbitraged prices that are relatively similar for wealthy and poor countries alike, this does not imply that sovereign nations are entirely powerless to offset some of the negative impact that higher energy prices have on production, available incomes and welfare.

The key ingredient in this regard is the tax imposed on gasoline. As noted, there is an excise tax in Israel on each liter of gas as well as a value added tax that is imposed on both the excise tax as well as on the other components. When the cost of gasoline in Israel is decomposed into its various components, the price of crude oil, distribution, refining, marketing, profits and taxes, then just that last component – taxes – was more expensive in Israel ($1.08 per liter) than the entire gallon of gasoline in the United States ($0.96 per liter – or, in terms of gallons, $4.09 for just taxes in Israel versus $3.65 for the entire gallon of gasoline in the States).

The cumulative amount of taxes levied by Israel on a liter of gasoline is considerably higher than in the United States and more similar – although at the higher end – of gasoline taxes in Western Europe. As indicated in Table 1, gasoline taxes in roughly three-quarters of the countries are lower than Israeli gasoline taxes. However, this is only a part of the larger picture.

Table 1. **International comparison of gasoline prices* and their domestically determined components**

Israel, Western Europe, North America, and Oceania, 2011
(in PPP dollars per liter)

	Gasoline prices		Taxes		Margins**	
1	Portugal	2.45	Greece	1.38	Portugal	0.27
2	Greece	2.34	Portugal	1.38	Spain	0.26
3	UK	2.02	UK	1.22	Greece	0.25
4	**Israel**	**2.00**	Netherlands	1.18	**Israel**	**0.25**
5	Netherlands	1.97	Germany	1.13	New Zealand	0.25
6	Germany	1.96	**Israel**	**1.08**	Belgium	0.25
7	Italy	1.95	Italy	1.08	Italy	0.25
8	Spain	1.86	Belgium	1.03	Ireland	0.22
9	Belgium	1.85	France	0.99	Canada	0.21
10	Ireland	1.77	Finland	0.97	Australia	0.20
11	France	1.73	Ireland	0.96	Denmark	0.20
12	Finland	1.65	Spain	0.91	Germany	0.20
13	Austria	1.60	Sweden	0.90	Netherlands	0.19
14	Sweden	1.57	Austria	0.88	US	0.19
15	Denmark	1.53	Norway	0.86	Switzerland	0.17
16	Norway	1.42	Denmark	0.85	Luxembourg	0.17
17	New Zealand	1.41	Luxembourg	0.67	Sweden	0.16
18	Luxembourg	1.38	Switzerland	0.58	France	0.16
19	Switzerland	1.16	New Zealand	0.57	Norway	0.16
20	Canada	1.09	Australia	0.33	Finland	0.15
21	Australia	0.99	Canada	0.33	UK	0.13
22	US	0.96	US	0.13	Austria	0.12

* Comparisons are for premium (95 octane) unleaded gasoline.

** Margins between crude oil cost and pretax prices (refining, distribution and profits).

Source: Dan Ben-David and Yulia Cogan, Taub Center.

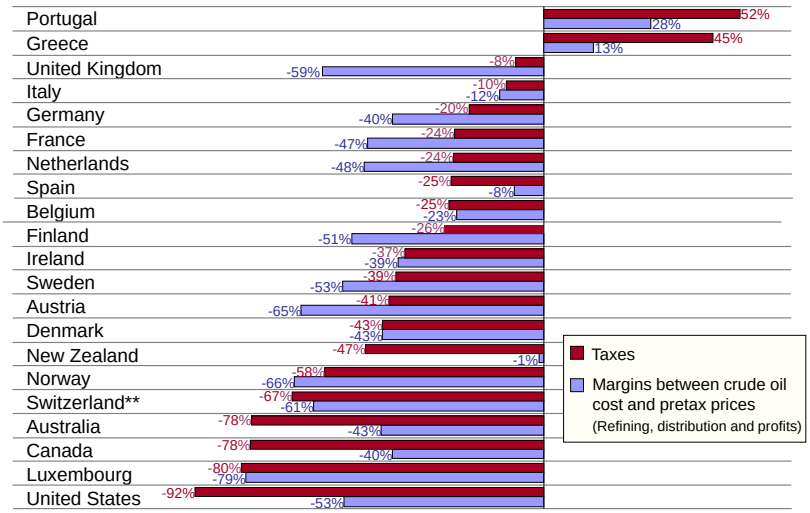
Data: Central Bureau of Statistics, Ministries Finance, Energy and Water Resources, Bank of Israel, OECD.

Israeli incomes are substantially below those of many European countries that tax gasoline at roughly the same levels. What this means is reflected in Figure 32, which shows how gasoline taxes relative to income levels in Israel compare with gasoline prices relative to income levels in European countries.

Figure 32

Gasoline taxes and margins as share of GDP per capita*

all countries relative to Israel, 2011



* Comparison is for 95 octane gasoline.

** Data for 2010.

Source: Dan Ben-David and Yulia Cogan, Taub Center.

Data: Central Bureau of Statistics, Ministries of Finance, Energy and Water Resources, Bank of Israel, OECD.

On average, when discounting for cross-country differences in living standards, the average tax on gasoline in the 21 countries was 35 percent below the Israeli gas tax, with taxes relative to income lower in 19 of the 21 countries. The primary impact of this is to substantially increase transportation costs for consumers and industry in Israel. In and of itself, this might not be too problematic a policy if there were adequate alternatives to the use of vehicles, but as the preceding section on Israel's transportation infrastructure shows, this is far from the case. The country's rail alternatives languished for decades as resources were diverted elsewhere. Even the surge in construction in recent years reflects expenditures relative to GDP at a level that other countries spend primarily on maintenance and which is insufficient for closing the gaps.

The subsequently higher cost of gasoline combined with the severe congestion on Israel's roads (two and a half times the OECD average, as pointed out in the preceding section) increases production costs and makes Israel's business sector that much less competitive against foreign competition abroad (exports) and at home (imports) – and this has a negative effect on employment and income in the country. To this, one can add the negative effect that the higher gasoline taxes have on available resources that consumers have to spend on other items, and the result is a decline in overall welfare.

Taxes are not the only domestically determined component of the gasoline prices that are high compared to other countries. An often-overlooked factor in determining Israel's gasoline prices is the money going to refining, distribution, marketing, and profits – in other words, the margin between the retail price of a liter of gasoline and the tax and crude oil components. This aspect of the cost is often hidden in the myriad calculations determining the heavily regulated price of gasoline in Israel.

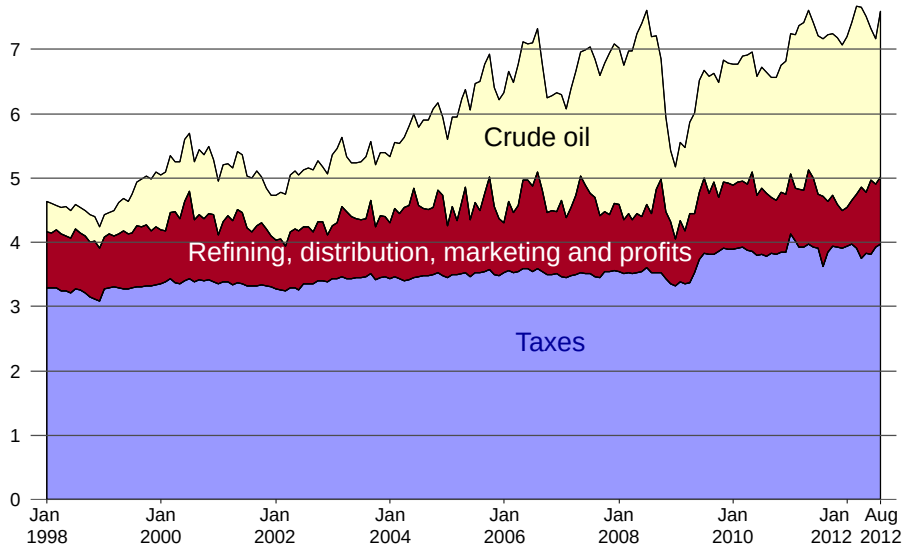
This margin reflects the difference between the gasoline price net of taxes and the crude oil import costs for each country. Figure 33 shows how this margin fits into the broader makeup of the final price of gasoline in Israel. The primary layer in the determination of the retail price is the

tax layer at the bottom. It is very thick, and getting thicker over the years, with the aforementioned jump in taxes in 2009 and the subsequent fluctuations around the new, higher tax level.

Figure 33

Price of gasoline in Israel, 1998-2012

price per liter by main components, 95 octane, in 2011 shekels



Source: Dan Ben-David and Yulia Cogan, Taub Center.

Data: Central Bureau of Statistics, Ministries of Finance, Energy and Water Resources, Bank of Israel, OECD

The top layer is the crude oil cost, which has been by far the most variable. The increases in this component of the gasoline prices have been very steep over the past 14 years and it has gone from being a relatively negligible part of the overall price of gas to a significant element – albeit, still less than the taxes on each liter of gasoline. The middle layer in the graph is the margin that goes to refining, distribution,

marketing and profits. Even after discounting for inflation, this margin has grown in Israel by over one-fifth during the past 14 years. While the margin appears to be overshadowed by the taxes and the price of crude oil, it is a non-negligible part of the cost of each liter of gasoline.

In the comparison with the other countries in Table 1, there are a number of countries with margins similar to those of Israel, though in the final analysis, the dollar value of the margins is nonetheless lower in 18 of the other 21 countries – and this is without taking into account the standard of living in each country. Such a comparison only heightens the degree to which gasoline margins in Israel are disproportionately high in comparison with the rest of the Western world. On average, Western gasoline margins are 38 percent below Israeli gasoline margins, when living standards in each country are taken into consideration. As Figure 32 demonstrates, the gasoline price margin relative to GDP per capita is substantially lower in nearly all of the other countries, with only two countries exhibiting higher margins.

To a certain extent, this kind of discrepancy between Israeli margins and those abroad is reflective of some of the underlying public sentiment against high prices in Israel – in general – compared with prices in other countries. Calls for increased competition, where possible, and increased public regulation – when such competition is not possible – have increased over the past few years. As the above analysis indicates, the argument that the price of gasoline in Israel is abnormally high is not without merit.

4. Summary

The picture painted in this chapter reflects Israel's national socioeconomic priorities. The country is akin to an island whose survival depends on an abnormally large diversion of resources – be they financial or be they in terms of manpower that is diverted away from productive economic activity – to its physical defense. There is always a question of how much is enough, but there is little question about Israel's need to incur a higher defense burden than is shouldered by other Western countries. This means that the remaining resources in Israel must be allocated and utilized much more carefully and judiciously – and this is the major question regarding the national priorities of civilian resources that Israel has avoided dealing with.

The relatively good economic climate in recent years, compared to other Western countries, has been deceiving and policy makers have confused between the relatively rosy short-term picture and the very problematic long-term one. The socioeconomic conditions that led to the summer 2011 protests focused attention to tips of the iceberg instead of to the iceberg itself.

But that iceberg is huge and Israel's demographics are currently leading the country straight into it. The country is not implementing serious changes in policy that would significantly alter Israel's national priorities and divert needed resources towards the primary human capital and physical infrastructures that have been allowed to decay and create the current socioeconomic long-run trajectories. Until there is a major diversion of priorities towards the welfare of many instead of the current biases favoring the few, Israel will continue along its very steady course. There is a point where the inertia will be too great to change course – and then it will simply be a matter of time until the country meets its iceberg.

It should be clear that this outcome is not destiny, nor is it written in stone. It is all a question of priorities and policies – and leadership. All the knowledge that Israel needs to change course is here, still, in its world-class universities and in its cutting-edge hi-tech and medical

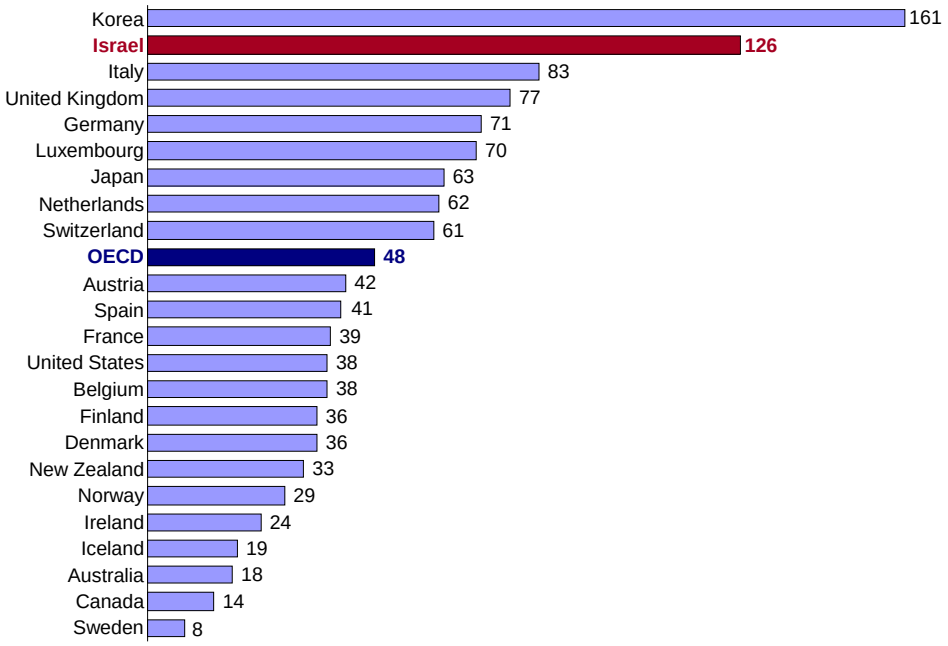
sectors. The question is whether the country's leaders will find the wherewithal to ensure that this knowledge reaches all of its children in time, before they grow up and are left to compete in a modern global economy with only Third World tools and infrastructures.

Appendices

Appendix Figure 1

Congestion on roads

vehicles per kilometer of road, 2008



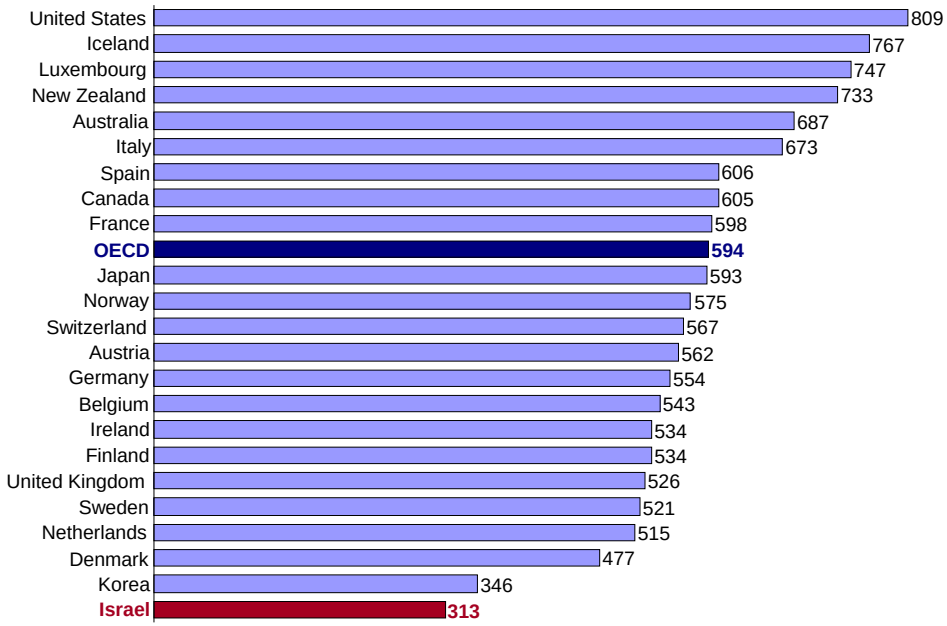
Source: Dan Ben-David, Taub Center and Tel-Aviv University.

Data: World Bank.

Appendix Figure 2

Vehicles per capita

per 1,000 people, 2008



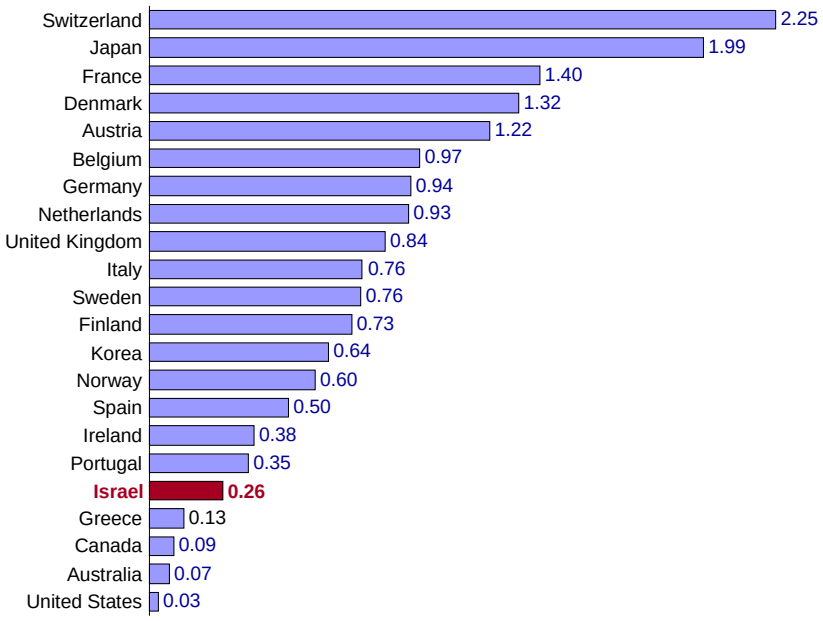
Source: Dan Ben-David, Taub Center and Tel-Aviv University.

Data: World Bank.

Appendix Figure 3

Railways – Passengers

kilometers travelled per capita, 2009



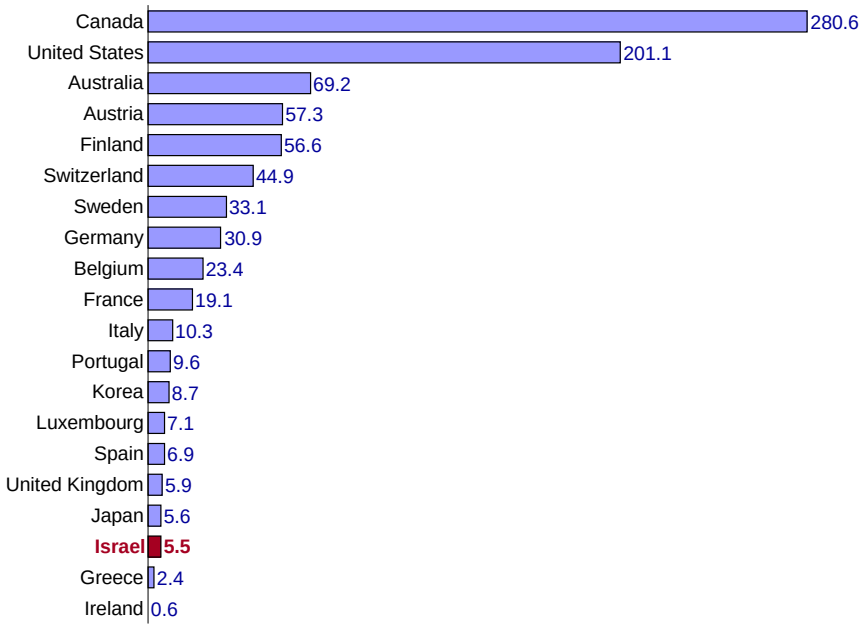
Source: Dan Ben-David, Taub Center and Tel-Aviv University.

Data: World Bank.

Appendix Figure 4

Railways – Freight

ton-kilometers of freight per thousand dollars of GDP, 2009*



* 2009 GDP in current US dollars and current PPPs.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.
Data: World Bank.

Appendix Table 1. **Distribution of employment and wages by industry, ages 35-54**

0-11 years of education only

Jewish Men	% of total	Wage	Arab Men	% of total	Wage	Jewish Women	% of total	Wage	Arab Women	% of total	Wage
average		**7,347**	**average**		**5,271**	**average**		**4,827**	**average**		**4,387**
Manufacturing	28.9%	7,940	Construction	32.0%	4,975	Health, welfare/ social work	23.7%	4,801	Health, welfare/ social work	24.0%	4,828
Wholesale/retail trade, car/bike repairs	19.0%	7,605	Wholesale/retail trade, car/bike repairs	17.7%	4,975	Wholesale/retail trade, car/bike repairs	14.8%	4,622	Wholesale/retail trade, car/bike repairs	13.1%	4,145
Transport, storage & com-munications	11.9%	7,634	Manufacturing	17.4%	5,650	Domestic help	11.8%	3,940	Education	12.6%	4,132
Construction	10.2%	6,952	Transport, storage & com-munications	11.3%	5,318	Manufacturing	11.5%	5,027	Domestic help	10.6%	
Real estate, rental services, business activities	7.6%	5,320	Lodging services & restaurants	5.1%	5,453	Real estate, rental services, business activities	10.7%	4,035	Manufacturing	10.3%	4,036
Community services, social personal, others	5.2%	6,918	Real estate, rental services, business activities	4.9%	4,510	Education	10.0%	4,912	Real estate, rental services, business activities	9.1%	3,082
Lodging services & restaurants	4.3%	6,675	Agriculture	3.2%	5,517	Community services, social personal, others	5,8%	4,652	Lodging services & restaurants	5.7%	

Appendix Table 1. (continued)

Public administration	3.5%	8,773	Community services, social personal and others	3.2%	5,446	Lodging services & restaurants	5.1%	5,562	Community services, social personal, others	5.4%	3,613
Health, welfare/ social work	2.8%	4,813	Education	1.7%	5,045	Public Administration	2.4%	5,674	Agriculture	4.5%	2,984
Agriculture	2.6%	5,685	Health, welfare/ social work	1.7%	3,329	Transport, storage & com-munications	1.9%	6,155	Public administration	1.9%	
Unknown	1.4%	8,958	Unknown	1.4%	7,539	Agriculture	0.9%	3,946	Unknown	1.4%	
Education	1.1%	4,872	Public administration	0.3%	5,210	Unknown	0.7%	3,525	Wholesale/retail trade, car/bike repairs	1.3%	12,854
Electricity & water	0.9%	12,492	Domestic help	0.0%		Banking, insurance & finance	0.6%	8,818	Electricity & water	0.0%	
Domestic help	0.6%	4,102	Electricity & water	0.0%		Electricity & water	0.1%	3,203	Construction	0.0%	
Banking, insurance & finance	0.5%	10,755	Banking, insurance & finance	0.0%		Construction	0.0%	11,027	Banking, insurance & finance	0.0%	
Extra-territorial organizations	0.0%		Extra-territorial organizations	0.0%		Extra-territorial organizations	0.0%		Extra-territorial organizations	0.0%	

Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

Appendix Table 2. **Distribution of employment and wages by industry, ages 35-54**
matriculation certificate only

Jewish Men	% of total	Wage	Arab Men	% of total	Wage	Jewish Women	% of total	Wage	Arab Women	% of total	Wage
average		**10,330**	**average**		**6,879**	**average**		**7,054**	**average**		**4,711**
Manufacturing	23.1%	9,255	Construction	28.0%	6,487	Wholesale/retail trade, car/bike repairs	17.0%	6,126	Education	30.1%	5,025
Wholesale/retail trade, car/bike repairs	18.9%	10,182	Manufacturing	17.2%	6,624	Health, welfare/ social work	16.7%	6,221	Health, welfare/ social work	23.7%	3,478
Real estate, rental services, business activities	10.8%	10,481	Real estate, rental services, business activities	16.8%	7,093	Education	11.4%	5,686	Transport, storage & com-munications	8.5%	4,075
Transport, storage & com-munications	10.7%	10,652	Transport, storage & com-munications	11.4%	6,287	Real estate, rental services, business activities	10.6%	7,113	Wholesale/retail trade, car/bike repairs	7.7%	3,512
Construction	7.6%	11,900	Public administration	5.2%	8,871	Manufacturing	10.2%	6,673	Community services, social personal, others	4.6%	
Public administration	6.6%	11,567	Community services, social personal and others	4.6%	8,721	Banking, insurance & finance	7.6%	10,324	Banking, insurance & finance	4.3%	5,853

Appendix Table 2. (continued)

Community services, social personal, others	4.9%	10,713	Real estate, rental services, business activities	4.2%	4,544	Community services, social personal, others	7.3%	6,808	Public administration	4.3%	7,835
Lodging services & restaurants	3.1%	9,895	Health, welfare/ social work	3.8%	7,366	Public administration	4.8%	8,771	Real estate, rental services, business activities	4.2%	5,540
Banking, insurance & finance	3.0%	17,728	Lodging services & restaurants	2.6%	5,245	Transport, storage & com-munications	4.0%	8,007	Lodging services & restaurants	4.1%	
Health, welfare/ social work	2.8%	7,860	Extra-territorial organizations	2.0%		Domestic help	3.5%	4,091	Manufacturing	3.7%	4,368
Agriculture	2.0%	11,483	Agriculture	1.9%	4,818	Lodging services & restaurants	3.0%	5,701	Construction	3.0%	
Education	1.9%	5,698	Education	1.5%		Unknown	1.3%	7,974	Unknown	1.2%	
Electricity & water	1.9%	13,887	Unknown	0.5%		Construction	1.3%	8,133	Domestic help	0.6%	
Unknown	1.7%	10,524	Banking, insurance & finance	0.4%	9,121	Agriculture	0.7%	5,328	Agriculture	0.0%	
Domestic help	0.9%	4,838	Electricity & water	0.0%		Electricity & water	0.5%	10,668	Electricity & water	0.0%	
Extra-territorial organizations	0.1%		Domestic help	0.0%		Extra-territorial organizations	0.0%		Extra-territorial organizations	0.0%	

Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

Appendix Table 3. **Distribution of employment and wages by industry, ages 35-54**
BA degree only

Jewish Men	% of total	Wage	Arab Men	% of total	Wage	Jewish Women	% of total	Wage	Arab Women	% of total	Wage
average		**18,376**	**average**		**10.949**	**average**		**12,215**	**average**		**7,712**
Real estate, rental services, business activities	29.7%	20,757	Education	26.5%	11,132	Education	30.4%	10,295	Education	69.4%	8,026
Manufacturing	15.8%	18,393	Health, welfare/ social work	19.6%	14,869	Health, welfare/ social work	17.7%	12,086	Health, welfare/ social work	17.1%	7,866
Education	9.3%	14,031	Real estate, rental services, business activities	15.9%	8,541	Real estate, rental services, business activities	15.2%	14,347	Real estate, rental services, business activities	3.9%	6,577
Public administration	8.4%	17,909	Public administration	11.2%	11,777	Manufacturing	8.1%	11,409	Community services, social personal, others	2.7%	10,022
Health, welfare/ social work	7.0%	19,509	Wholesale/retail trade, car/bike repairs	10.4%	7,700	Banking, insurance & finance	6.2%	16,390	Banking, insurance & finance	1.5%	10,659
Wholesale/retail trade, car/bike repairs	6.3%	15,664	Transport, storage & com-munications	5.3%	5,055	Public administration	5.5%	14,308	Lodging services & restaurants	1.2%	
Banking, insurance finance	5.9%	22,450	Construction	4.4%	5,959	Wholesale/retail trade, car/bike repairs	5.4%	10,353	Public administration	1.1%	

Appendix 3. (continued)

Transport, storage & communications	4.9%	16,229	Manufacturing	2.2%	15,072	Community services, social personal, others	4.6%	13,338	Manufacturing	0.9%	3,579
Community services, social personal, others	4.4%	15,930	Community services, social personal, others	2.0%	4,600	Transport, storage & communications	2.9%	9,387	Wholesale/retail trade, car/bike repairs	0.8%	8,041
Construction	2.6%	14,948	Lodging services & restaurants	1.1%		Unknown	1.0%	18,011	Unknown	0.7%	
Unknown	2.1%	18,608	Unknown	0.5%	14,078	Domestic help	0.9%	4,185	Transport, storage & communications	0.6%	5,479
Electricity & water	1.8%	18,013	Extra-territorial organizations	0.5%		Construction	0.8%	11,474	Agriculture	0.0%	
Agriculture	0.8%	22,567	Banking, insurance & finance	0.4%	13,733	Lodging services & restaurants	0.6%	7,.475	Electricity & water	0.0%	
Lodging services & restaurants	0.7%	6,840	Agriculture	0.0%	12,097	Agriculture	0.4%	10,887	Construction	0.0%	
Domestic help	0.1%	9,833	Electricity & water	0.0%		Electricity & water	0.2%	19,287	Domestic help	0.0%	
Extra-territorial organizations	0.0%		Domestic help	0.0%		Extra-territorial organizations	0.0%		Extra-territorial organizations	0.0%	

Source: Dan Ben-David and Eitan Regev, Taub Center.

Data: Central Bureau of Statistics.

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