The Cost of Living in Israel: An International Comparison and Historical Perspective

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Abstract

Recently, there has been a lively public discussion surrounding the cost of living in Israel, and it is frequently claimed that the prices of consumer products are higher in Israel than abroad. Studies find partial evidence that compared to other developed countries, the price level of private consumption in Israel is relatively high considering that income per capita in Israel is relatively low. The findings in such international comparisons, however, are obfuscated by the influence of fluctuations in currency exchange rates, an issue not addressed properly in earlier studies. In this chapter, this issue is examined by conducting an international comparison of price rates over 25 years. This long-term comparison serves as a test to assess whether the high price level observed in recent years is temporary and can be explained by, for instance, the appreciation of the shekel in 2008, or whether it is a long-term process associated with structural facets of the economy. The study finds that fluctuations in the nominal exchange rate cannot account for the high price levels found in earlier studies and that high prices are a long-term phenomenon which are likely related to structural factors in the local market.

In addition, the chapter examines the price changes in the various consumption categories, focusing on the food industry where there was a rapid rise in prices concurrent with an increase in profits during the second half of the last decade. These findings indicate the importance of continuing to expose the economy to imported goods as a means of increasing competition, reducing prices and improving consumer welfare in Israel.

Introduction

Since the outbreak of the social protests in July 2011, there has been an ongoing discussion about the level of prices in Israel, and the media and social networks carry frequent comparisons of a range of consumer products between Israel and other countries. Following these discussions, many attempts have been made to check whether consumer products in Israel are, in fact, more expensive compared to other developed countries. However, comparing the price of a typical consumer basket between Israel and other countries is not enough for a thorough comparison, though. The income level in each country must also be taken into account. The literature and empirical findings indicate that the higher the country's income level the higher the prices, and, therefore, the price of a typical consumer basket should not be assessed without considering the income level. In fact, the relationship between price level and income level (represented here by per capita GDP) is perceived as a key indicator of standard of living. Such a comparison, though, has a major problem: currency exchange rates fluctuate sharply, and these fluctuations are usually not fully reflected by the local price level. In order to reduce the influence of the exchange rate, this chapter presents a comparison of price levels in various countries over a period of 25 years, from 1990 to 2015. The long-term comparison minimizes the impact of exchange rate changes on the results and contributes to understanding the issue of the cost of living and the interaction between wage levels and price levels in international comparisons.

The first section of this chapter will examine the price levels in Israel compared to other developed countries in 2014, taking into account the per capita GDP in each country. This will be followed by a long-term comparison with reference to the exchange rate. Its results reinforce the claim that price levels in Israel are higher than would be expected compared to the rest of the developed world given the income level. The third section discusses the development of prices in Israel broken down by expenditure category, with an emphasis placed on the food industry, where there was a rapid and sharp price increase relative to other industries. This phenomenon was apparently the result of a change in the structure of competition in the industry in the second half of the last decade. The chapter concludes with a brief discussion of some of the policy implications from the findings.

1. The Price Levels in Israel Compared to Other Developed Countries

Figure 1 presents the consumption price level in OECD countries (the vertical axis) and per capita GDP, representing the standard of living in the country (the horizontal axis). As can be seen, there is a statistically significant positive relation between the variables: the richer the country, the higher its price levels. The high correlation between price levels and income levels in the country has been discussed extensively in the literature. The common explanation is the one offered by Balassa (1964) and Samuelson (1964) (henceforth: Balassa-Samuelson), according to which in the rich countries the productivity in the tradable industries tends to rise faster than in the non-tradable industries. Tradable products are products and services that can be traded on the international market, such as clothing and shoes, whereas non-tradable products are sold only on the local market, such as postal services. The rise in productivity in the tradable industries leads to a wage increase in these industries, resulting in a migration of workers from the non-tradable industries to the tradable ones as well as to a wage increase in the non-tradable industries. In turn,

productivity in the non-tradable industries improves to a lesser extent, thereby raising production costs in those industries. Due to all of these factors, firms in the non-tradable industries respond by raising their prices. Given free international trade, the price of imported products does not go up, resulting in the rate of price rise in the non-tradable industries being higher. As a result, the general price level, the relative productivity, and the price ratio between tradable and non-tradable products are all higher in rich economies.[1] Kravis and Lipsey (1983) and Bhagwaty (1984) offer an alternative explanation, by which the capital-employee ratio in the rich countries is higher and, therefore, the workers' marginal productivity is higher – and so are wages, accordingly. Since the non-tradable products are labor-intensive, the result is that they are more expensive in the rich countries, where the employees' wages are higher.[2]

Many studies discuss the question of under what conditions price levels in the economy reflect the Balassa-Samuelson equilibrium. The literature finds that it depends to a large extent on the economy's openness to international trade, and to a certain extent also on the distance between the economy and its main trade partners. Countries that have trade restrictions, low local competition, no economies of scale, and are distant from additional potential markets, tend to be characterized by high price levels relative to income.[3] So, for example, in many cases

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[1]   The existence of the Balassa-Samuelson effect is an important basis for many macroeconomic models, although the evidence for it is not conclusive. Balázs, Drine, Lommatzsch, and Rault (2003), and Tica and Druzic (2006) present a review of empirical findings on the subject.

[2]   Recently, Frisch (in progress) examined the empirical validity of these hypotheses and did not find supporting evidence for them.

[3]   Alba and Papell (2007) show that low inflation rates and low fluctuation of the exchange rate are additional variables that influence the convergence of prices between countries to a similar level. Evans (2003) shows that transport costs can explain part of the price gap, depending on the substitution elasticity between local production and products from overseas. Andersson, Masuch and Schiffbauer (2009), who checked price gaps in Europe in the years following the transition to a uniform currency, found that the variance in price

international manufacturers adopt a strategy of price discrimination (differential pricing for different geographical areas) and adjust price levels to levels of local competition. A pro-free trade policy makes it difficult for manufacturers to adopt price discrimination and reduce the price gap between the local and foreign markets.[4] The Israeli experience shows that exposing the economy to imports in the early 1990s led to a drop in prices and increased competition in industries exposed to imports, which resulted in an increase in the supply of products and an improvement in consumer welfare.[5] On the other hand, countries characterized by large and competitive local markets, which are in close proximity to additional potential markets, tend to converge to a more comfortable price level relative to the per capita income.

Figure 1 shows a trendline that describes the expected price level in each country relative to its per capita GDP (using a log-linear quadratic equation[6] – see Appendix Table 1). Israel's price level is 1.4 standard deviations above the trendline, which is to say that its price levels are

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disparities that could not be explained by the level of per capita GDP could be explained, among other things, by differences in standards and regulations. Furthermore, they argued that part of the variance in price levels could also be explained by differences in the location of the countries in the business cycle.

[4] See discussion on the subject by the Ministry of Economy (2014, p. 31). Balassa-Samuelson assume price equality between tradable products, but other studies have found that even the prices of those products were characterized by a relatively high variance. Alessandria and Kaboski (2011) show that a large part of the variance in the prices of tradable products derives from a policy of price discrimination and, to a lesser extent, from non-tradable components of the tradable products, such as marketing and distribution.

[5] According to the Ministry of Finance (1997, Chapter 17), the Report of the Committee for Social Economic Change (2011), and Elbert (2003). Feenstra and Weinstein (2010) found that the rise in the level of competitive imports in the 1990s in the US led to a rise in the prices of a range of products, a 5.4 percent drop in industrial products, and an overall 1 percent drop in consumer prices.

[6] Similar results are attained using a log-log regression.

higher than expected given per capita GDP. This is a high deviation
compared to the rest of the countries included in the comparison, but it is
not statistically significant. It is also notable that the price level in the
United States is extremely low relative to its income. As a result, a
regression analysis of a relatively small sample of countries including the
US suffers from large standard deviations, and consequently from low
statistical significance. Therefore, the comparisons presented from here
on do not include the US.

Figure 1
Consumer prices and per capita GDP in the OECD countries,*
2014
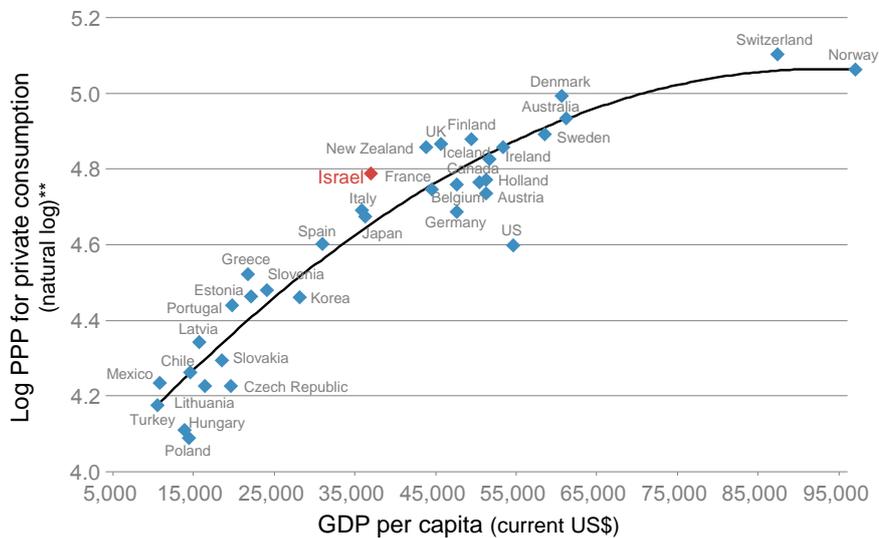
*   35 OECD countries, including Lithuania and Latvia and excluding Luxembourg

** The regression estimate is calculated using an equation where the log of the price
     level is explained by the squared polynomial of per capita GDP. Similar results were
     found using a regression where the per capita GDP log was explained by the log of
     price levels.

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat; IMF

The picture that emerges from the figure is consistent with previous comparisons in this area. An examination by the Bank of Israel (2012) for 2010 found that consumer prices were almost 20 percent higher than expected by the trendline – a substantial deviation, according to the authors of the report.[7] The Knesset Information and Research Center found a similar result using 2013 figures (Millard, 2014). In contrast, in a study by the Bank of Israel (2015) using 2013 figures, the researchers conclude that the consumer prices in Israel are not particularly high. According to these studies, consumer prices in Israel are comprised of particularly high prices for certain products (especially food, beverages and automobiles) and reasonable prices for other products.

2. *Price Levels Compared Over Time*

Currency exchange rates play a central role when conducting international comparisons of price levels. Consumer prices are calculated using the World Bank and IMF purchasing power parity (PPP) indices, which represent the number of local currency units needed for a fixed consumer basket in the local market. By converting the price of the basket in each country to a uniform currency, an international comparison of consumer prices can be made. Since currency rates fluctuate greatly, the price ratio between countries may change accordingly. It is clear, then, that a comparison of relative cost of living in a given year is extremely sensitive to exchange rate fluctuations.[8] In the Israeli context,

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[7] The researchers qualify this, noting that the deviation is not statistically significant.

[8] An appreciation of the currency rate may raise the relative price level, but it also raises the income level compared to overseas. Therefore, the consequences of that fluctuation on the price level standardized for per capita GDP are not unequivocal. In a competitive market, the strengthening of the currency is also reflected by a cheapening of imported products, and therefore there can theoretically be a situation where the strengthening of the local currency would actually lead to a drop in the relative consumer prices. This

the Bank of Israel (2015) points out that changes in the exchange rate hardly filter down to the local prices and, therefore, an appreciation of the shekel would contribute to a higher price level relative to other countries.

The comparison of local prices to prices in other countries is actually a test of the economy's real exchange rate.[9] It is commonly assumed that the real exchange rate is determined in the long run by the country's per capita income level, and that a deviation from that connection reflects short and medium-term macroeconomic occurrences. Therefore, a deviation from the trend of the association between the two indices, as happens in Israel, can lead to one of the two possible following conclusions:

A. Consumer products in Israel are expensive compared to countries with a similar level of development;

B. The real exchange rate is overly appreciated, which is to say that the value of the shekel compared to other currencies diverges from long-run equilibrium.

This is not a simple issue and cannot be solved with econometric tools. It is an essential question: What is the exchange rate that reflects the fundamental factors of the economy that would allow a comparison whose results do not reflect transitory factors? To answer that question, the relation between price levels and per capita GDP in Israel over a longer period of time will be examined. If it turns out that the deviations from the expected trend fluctuate randomly around a long-run average, it

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scenario could materialize when an appreciation of the currency leads to a lower rise in the relative price level than the curve of the regression line. In practice, the positive correlation between the location of the country relative to the regression line and the fluctuation of the exchange rate exists in all of the countries in the comparison.

[9] By definition, the real exchange rate is the price ratio between the local economy and abroad. That comparison shows the price ratio of private consumption, whereas the real exchange rate is calculated by the price ratio of all of the components of the product.

may be assumed that that average represents a reasonable approximation of the price ratio that relies on long-run basic factors. This hypothesis relies, among other things, on the weak form of the law of one price.[10]

According to that hypothesis, the price ratio between developed countries tends to fluctuate around a permanent long-run average when prices are measured using a uniform currency. The hypothesis supposes that a change in the nominal exchange rate would open an arbitrage gap until the price ratio between the countries returns to its previous level. The literature finds that this hypothesis holds among developed countries, but is violated in countries that experience rapid and continuous growth.[11] The Bank of Israel (2015, p. 190) notes that, in keeping with the hypothesis, Israel's real exchange rate developed over the past decades without a trend of revaluation or depreciation.

Figures 2A and 2B show the distance of the consumer prices in Israel from the expected trendline based on per capita GDP in the country (the regression estimate is calculated separately for each year).[12] Figure 2A, which includes a sample of 25 OECD countries (without the countries that were members of the Soviet bloc and without Chile, for which there are no figures for the earlier years), indicates a drop in relative consumer prices in the first half of the 1990s. From 2004 until 2007, the price level

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[10] According to the strong form of the law of one price there should be absolute price equality of tradable products between countries. The literature tends to reject the strong form of the law and adopt the weak form, which does not require absolute price equality but maintains that the price ratio between developed countries tends to return consistently to the long-run average level (with certain restrictions). For discussion of the subject, see Rogoff (1996) and Engel and Rogers (2001).

[11] To be precise, it can be assumed that the weak form of the law of one price hypothesis will not hold for countries that experienced rapid growth compared to their trade partners, in keeping with the Balassa-Samuelson hypothesis.

[12] The effective nominal exchange rate represents a weighted average of the exchange rate vis-à-vis Israel's main trade partners, as calculated by the Bank for International Settlements (see link at https://www.bis.org).

was close to the trendline and, in 2008, there was a sharp rise in price levels compared to prices abroad, with some stabilization noted in the last few years.

Figure 2A

Excess price levels, 1990-2014

Israel's deviation from the regression estimate, sample of 25 OECD countries*
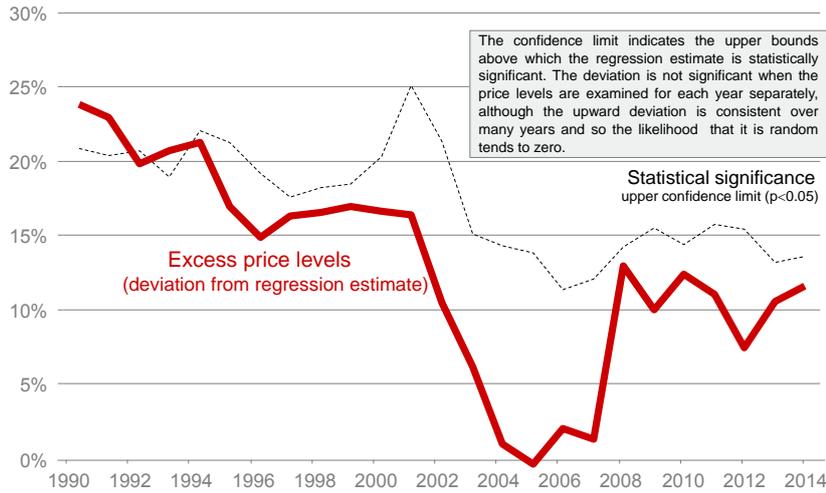
*   The regression estimate is calculated for each year separately; OECD countries excluding the US, Estonia, Hungary, Slovenia, Slovakia, Czech Republic, Chile, Poland, and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat, IMF

Figure 2B presents a similar picture for the years 1995 to 2014 with a slightly wider sample, including 32 OECD countries. This figure adds a long-run average, and shows that the deviations from the trendline fluctuate around an average of about 12 percent. The figures do not include Lithuania and Latvia, which were included in Figure 1, the US,

where prices are especially low, and Luxembourg, where per capita income is double the OECD average.
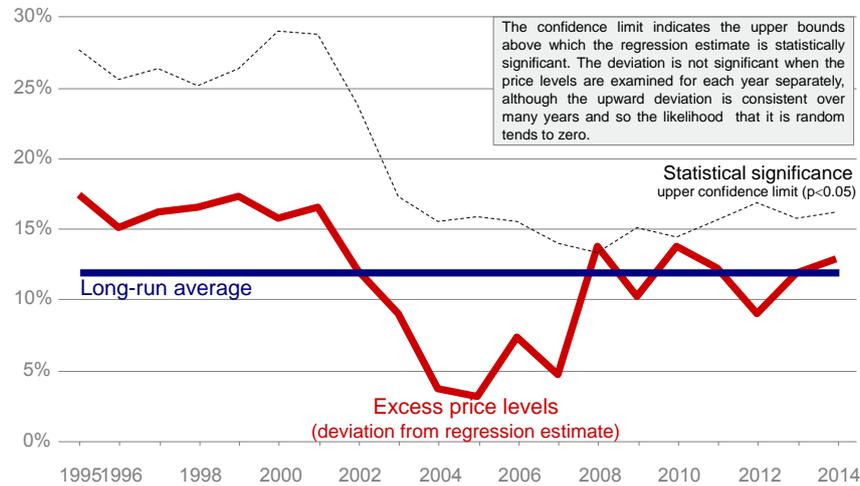
Another interesting finding from Figure 2A is the drop in relative consumer prices in the first half of the 1990s. In 1991, major trade liberalization measures were adopted. As a result, the prices of the products exposed to imports dropped and the total imports in the economy increased (Ministry of Finance, 1997). The rapid drop in consumer prices in Israel in those years compared to prices abroad can be explained, among other things, by these measures.[13]

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[13] Ricci, Milesi-Ferretti and Lee (2008) showed that opening a closed economy to international trade leads to a real devaluation of 12 percent; see also a discussion on this subject in Goldfajn and Valdes (1996). According to Misher (2003), in the early 1990s the volume of entry of foreign capital into Israel increased, and that increase might partially explain the high price level in Israel during that period. Broda (2006) showed that countries with permanent exchange rate regimes are characterized by high price levels compared to abroad, and it is reasonable to assume that the drop in price levels during that time is also the result of liberalization processes of the shekel. Additionally, during those years, there was rapid growth in countries at the bottom end of the per capita product distribution, and the observed drop might also derive from the changes in the distribution of per capita GDP in the comparison countries.

Figure 2B

Excess price levels, 1995-2014

Israel's deviation from the regression estimate, sample of 32 OECD countries*

The confidence limit indicates the upper bounds above which the regression estimate is statistically significant. The deviation is not significant when the price levels are examined for each year separately, although the upward deviation is consistent over many years and so the likelihood that it is random tends to zero.

Statistical significance
upper confidence limit (p<0.05)

Long-run average

Excess price levels
(deviation from regression estimate)

*   The regression estimate is calculated for each year separately; OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
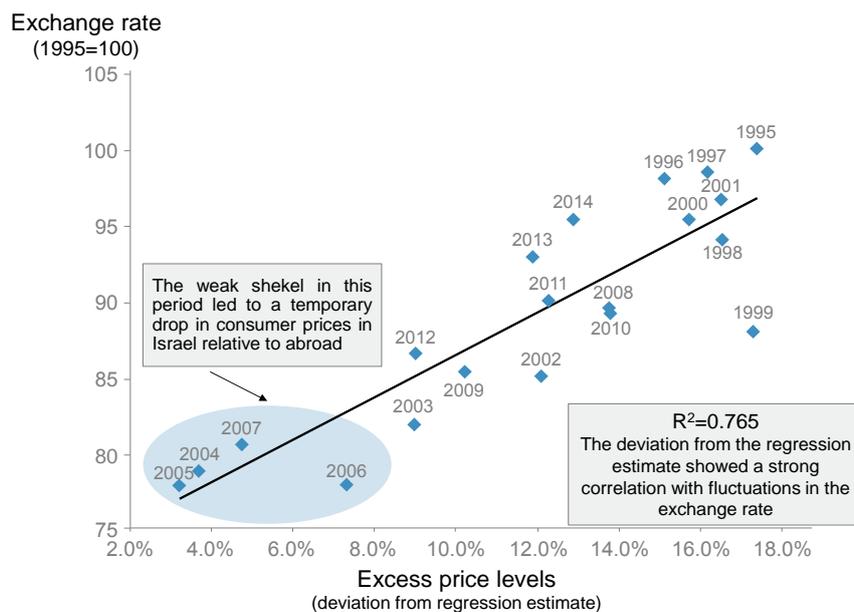Data: OECD Stat, IMF

Figure 3 shows the relationship between the deviations from the trendline and the nominal effective exchange rate; it exhibits a close relationship over the years. The figure sheds light on two noteworthy developments of the past decade: the relatively comfortable level of prices from 2004 to 2007 when the shekel was weak, and the relative rise in prices in 2008 following the devaluation of the shekel. As seen, the fluctuations in consumer prices are explained well by the nominal exchange rate. The relationship between the two variables creates a paradox: in years in which the business cycle is high relative to abroad and the shekel gets stronger, the local consumer will find the cost of

living higher relative to abroad, while, in contrast, in periods when the shekel is weak, the cost of living eases relative to other countries.

Figure 3

Excess price levels and exchange rate*

distance of private consumption from regression estimate as a function of
the nominal effective exchange rate, 1995-2014

*   The regression estimate is calculated for each year separately; 32 OECD countries
    excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat, IMF

Are Consumer Prices High in Israel Due to Structural Factors?

Figures 2A and 2B show the upper bound of the 95 percent confidence interval of the forecast values. When the deviation from the trendline (the red curve) is above the confidence interval line, the difference is statistically significant during that year.[14] As can be seen, the deviation from the trendline is within the confidence interval in most years, which is to say that it is not significant when the regression is run for each year separately. However, as will be shown, since the deviation occurs in all of the years examined, except during the years in which the shekel was devalued (2004 to 2007), the likelihood of finding that prices in Israel exceed the trendline randomly tends to zero. This strengthens the conclusion that consumer prices in Israel are high when they are examined over a long period of time.

In order to conduct comparative test of price long-run price levels, it is assumed that the standard deviation does not result from an omitted variable, but is "white noise," such as the predicted cyclical fluctuation according to the weak form of the law of one price. With this assumption, consumer prices were examined for 1995 to 2014 using an additional statistical test.[15] The test shows that, for 29 of the 32 countries in the

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[14] The lower confidence limit is not presented here for reasons of convenience, and it equals the negative value of the upper limit. For example, if the upper confidence limit is 15 percent above the trendline, the lower limit will be 15 percent below the trendline.

[15] One method for analyzing this issue could be by running a single regression with fixed effects for country and year. The disadvantage of this is that there is a partial loss for the interaction with time. For this reason, there is an advantage to running the regression for each year separately and examining the regression residuals via a separate statistical test in the second stage. To this end, we assumed that the standard deviation does not derive from an omitted variable correlated with the error term, but rather that it is "white noise," and tested this hypothesis by checking for the existence of a unit root in the panel data of the regression residuals (using first and second generation panel unit root test). The results support the assumption that the residuals are

comparison presented in Figure 2B, price levels in Israel are significantly higher at the 5 percent significance level (for Japan, Chile and Mexico the difference was not statistically significant).[16]

The results strengthen the hypothesis that price levels in Israel are structurally high compared to OECD countries. In accordance with the weak form of the law of one price hypothesis, relative consumer prices in Israel fluctuate around a long-run average resulting in the fact that at certain times Israel is significantly more expensive than other developed countries, and at other times its price levels are similar to that of developed countries, considering per capita income.

Figures 4A and 4B present this finding graphically and rank the comparison countries by the average standard deviation from the regression estimate. Israel's relative position indicates its long-term average of price levels (Figure 4A). The deviation from the regression is shown both for from the mid-1990s and for 2000 to 2014.[17] As seen,

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stationary. Thus, we find the assumption reasonable that the standard deviation does not derive from an omitted variable correlated with the error term.

To compare consumer prices over time, a Mann-Whitney non-parametric test was run to check whether the distribution of Israel's location in the various regressions was obtained by a distribution similar to that of another country in the sample. The test was run for each country separately. The basic hypothesis was that the location of the country in each regression was drawn from some distribution, and the test checks whether the distributions between two different countries are different. The null hypothesis is that there is no difference between the samples, and the test finds that the hypothesis can be rejected at a significance level of 5 percent for 29 of the 32 comparison countries presented in Figure 2B.

[16] The only change from moving to a 1 percent significance level is that the null hypothesis is not rejected for Portugal.

[17] Another comparison was made from the start of the new millennium because during the earlier period, structural changes occurred in the Israeli economy and abroad, including the stabilization of inflation, increased flexibility in the exchange rate, completion of the plan to open the economy to competitive imports and founding of the Eurozone.

private consumption prices in Israel, taking account of the income level, are higher than in all of the other countries except for Japan.

Figure 4A

Ranking countries by excess price levels

ranking of deviation from regression estimate in standard deviation units, multiyear average*
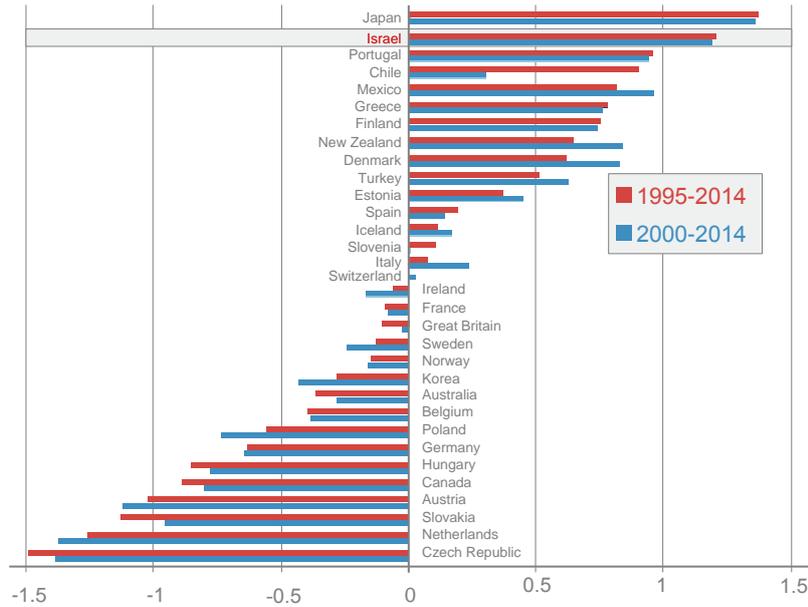
*   The regression estimate is calculated for each year separately; 32 OECD countries excluding the US and Luxembourg

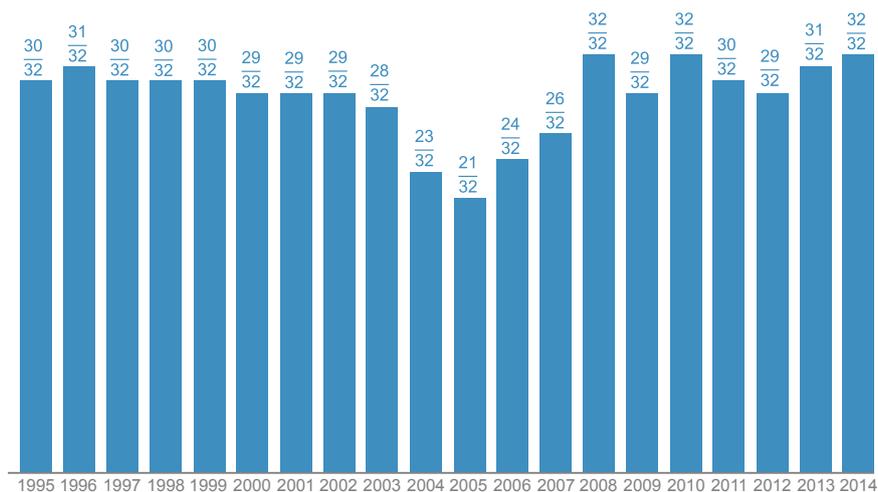Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat; IMF

Figure 4B shows Israel's rating compared to the other countries for each year. Thus, for example, in 1995 Israel is ranked 30 out of 32 countries, which is to say that in a country comparison all but two countries are cheaper than Israel when controlling for per capita income.

The figure indicates that Israel is rated consistently at the upper end of the country ranking throughout the study period.

Figure 4B

Israel's relative position in an international ranking of price levels adjusted for income, 1995-2014*

ranking of the deviation from regression estimate for Israel relative to 32 other countries of comparison

*   The regression estimate is calculated for each year separately; 32 OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat, IMF

Another possible explanation for the drop in relative consumer prices between 2004 and 2007, aside from the devaluation of the shekel, is a change in the competitive structure of the local market. If such a change has occurred, this would result in a structural break in the connection between the effective nominal exchange rate and the deviations from the trendline. As is evident from Figure 3, the correlation between the nominal exchange rate and the price level does not seem to have changed

from 1995 to 2014, and there is no suggestion of a change in the years in question (2004-2007). This strengthens the possibility that the relatively low level of consumer prices during those years is explained by the temporary devaluation of the shekel. Furthermore, Eckstein and Friedman (2011) find that from 2005 to 2007, the real exchange rate deviated from the various definitions of equilibrium.[18] Therefore, it is likely that the correlation between consumer prices and the income level during those years was not the result of a structural change in the local economy, but rather a temporary devaluation of the real exchange rate.

The argument that the high price levels in Israel in recent years when compared with other countries cannot be explained by an excessive appreciation of the real exchange rate can be supported in a similar manner. Eckstein and Friedman (2011) find that the strengthening of the currency in 2008 constituted a return to equilibrium after years in which the currency was excessively depreciated, and do not find evidence of an excessive revaluation in the years 2009 to 2010.[19] Likewise, Figure 2 (above) indicates that price levels have exceeded the trendline in each of the last seven years, and it would be difficult to assume that there would be such a lengthy deviation of the real exchange rate from its level in a state of equilibrium.[20]

Despite the fluctuation in the nominal exchange rate, in only four of the last 25 years was the price level located close to the trendline. Therefore, it is more likely that Israel's diversion from the trend of

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[18] There are several definitions for equilibrium of the real exchange rate. According to one approach, equilibrium is defined as a rate that balances the current account.

[19] The researchers find that the shekel was overly appreciated in 2008, overly depreciated in 2009, and came close to equilibrium in 2010.

[20] According to Rogoff (1996), the length of time until the fading of half time of the deviation from long-run equilibrium is three to five years. Later studies indicate a shorter period of two and a half years. A study by the IMF found that about one-quarter of the deviation fades within a year (Ricci et al., 2008). Chortareas and Kapetanios (2009) present a review of empirical findings on the subject.

association between consumer prices and per capita income is rooted in a long-term phenomenon connected to structural aspects of the economy, and is not caused mainly by the appreciation of the shekel in 2008.

3. *The Components of Private Consumption*

The previous section reinforces the hypothesis that prices in Israel are high compared to other countries when taking income level into account. To complete the picture, this section will examine the changes in the prices of various elements of consumption over the past 15 years.

Figure 5 shows the development of the main categories of the Consumer Price Index from 2000 to 2015. Cumulative inflation is 32 percent from the beginning of the previous decade, which is an average of 2 percent a year – the center of the Bank of Israel's target for price stability, which is between 1 and 3 percent a year.

Figure 5
Change in components of the Consumer Price Index, 2000-2014
Index: 2000=100
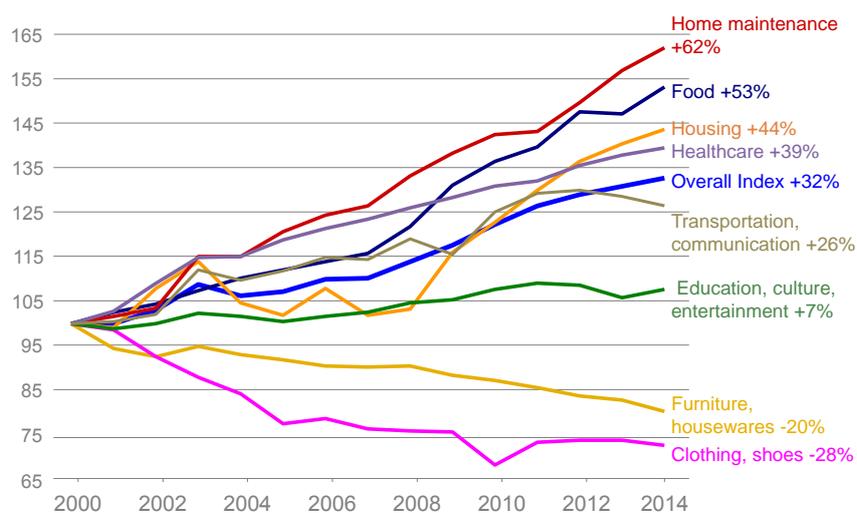
Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

The moderate rise in the Consumer Price Index is a result of a balance between products that appreciated at a relatively high level – especially in the categories of food, housing services and house maintenance – versus a moderate appreciation or reduction in other categories such as clothing and shoes, furniture and household goods. The main reason for the reduction is globalization and the exposure of those groups of products to imports over the 1990s.[21]

Figure 6 shows the changes in the Consumer Price Index according to the product's tradability.[22] The figure shows that the prices of the non-tradable products rose at a higher rate than the general index: a cumulative rate of 43 percent, which is 2.6 percent a year. The prices of the tradable products rose at a lower rate: 16 percent cumulatively, which is about 1 percent a year. The conclusion that arises from these data is that a large part of the price rise derives from non-tradable products, and particularly from the categories of housing, house maintenance and food, which comprise nearly half of the average household expenditure. This trend seems to correspond to a certain extent with the appreciation of the shekel in the past years, which acted to reduce the prices of tradable products compared to non-tradable products.

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[21] The Bank of Israel (2015) found that the prices of these components also dropped in many other countries, but in Israel the drop was more significant.

[22] The breakdown is made by the Bank of Israel and published frequently.

Figure 6
Change in price index by tradability group
Index: 2000=100
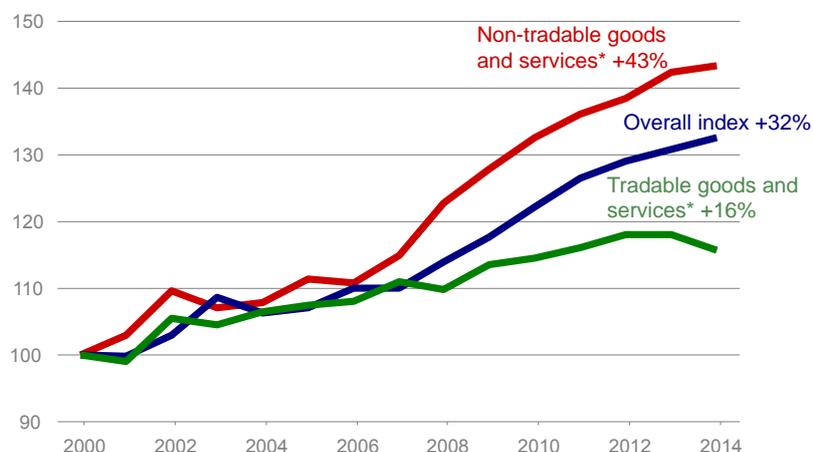
* Tradable goods and services are those with international trade, like
  clothing and shoes; non-tradable goods and services are from the
  local market only, like housing

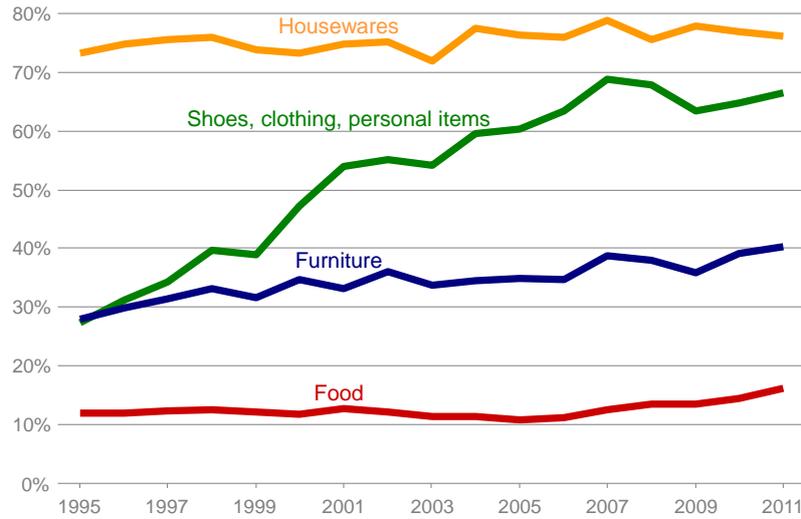Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

Price Levels in the Food Industry as a Test Case

An examination of developments in the Israeli food industry in recent
years can indicate the importance of competition for setting price levels
in the Israeli economy compared to abroad. This industry is very
centralized, and a small number of large local companies supply most of
the food sold in Israel (Monitor, 2012). In the early 1990s, a plan to
gradually introduce competitive imports was implemented in the Israeli
economy, and it led to a significant rise in the imports of various products
such as shoes, clothing and furniture. The import rate of food products
remained extremely low, and even today, it is only 16 percent of total
private expenditure on food (Figure 7). The low level of import is a result

of the extent of customs protections, the proliferation of maximum quotas in the sectors of food products and agriculture, and the proliferation of standards and standards testing in the industry.[23]
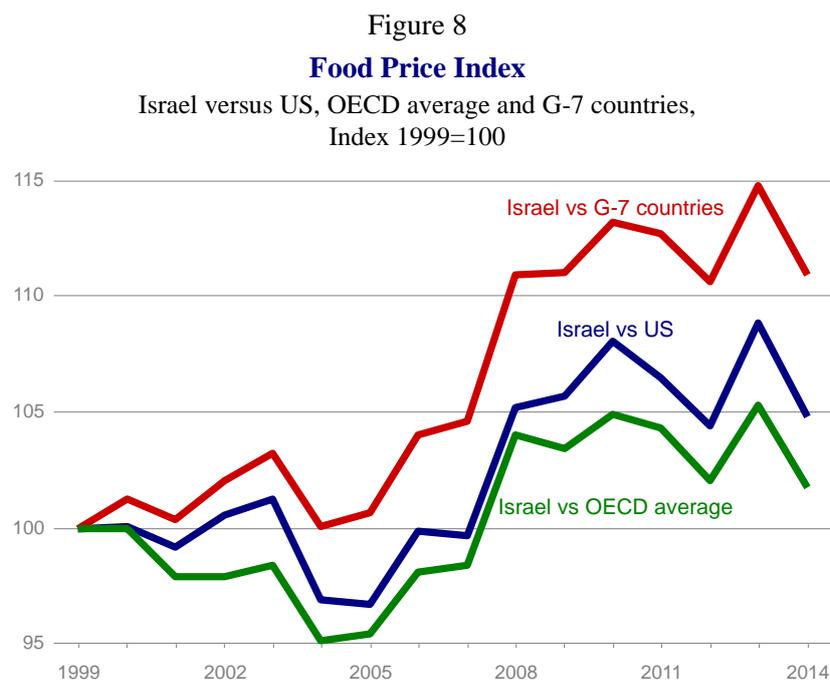
Figure 7
Import rate out of total consumption, 1995-2011
as percent of expenditure in each category

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

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[23] A review by the State Comptroller's office in 2014 found that the official standards in the food industry originate in Israel and do not correspond to international standards (State Comptroller Report, 2014). The policy of creating original standards that differ from the standards in other large economies is also common in other areas, and constitutes a barrier for competitive imports.

The second half of the last decade saw a rapid rise in food prices – a relatively unique phenomenon for the Israeli economy (as opposed to the rise in housing prices, for example, shared by other countries that did not experience the financial crisis). Figure 8 shows the development of food prices in Israel compared to the rest of the developed countries, and indicates an exceptional rise in food prices in Israel beginning in 2006.

Figure 8
Food Price Index
Israel versus US, OECD average and G-7 countries,
Index 1999=100

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

Figure 9 shows that the rise in food prices was accompanied by a rise in return on capital, meaning a rise in the profit margins in the industry. A non-competitive market can explain a high price level, but cannot explain the continuous rise in price levels. Therefore, the rise in food prices along

with the rise in profit margins indicates a change in the competitive structure of the industry, and there is indeed evidence to that effect. For instance, the Committee to Examine Competitiveness in the Food and Consumer Goods Market indicated the collapse of the Club Market chain and its purchase by Supersol in 2006 as a key factor that led to a drop in competitiveness and a rise in prices in the retail sector (Ministry of Economy, 2012). Likewise, that year the Ministry of Health toughened its procedures for the parallel import of food products, as part of the changes in the supervision regime following the "Remedia Affair."[24] The import track by other than exclusive importers poses a competitive threat to the local food manufacturers and its restriction may have helped raise the profit margins in the industry.[25] According to another view, the sale of Tnuva to Apax Partners in 2008 led to a strategic change in the industry and a more aggressive policy of maximizing profits by the food corporation.[26] Friedman (2012) shows that in late 2008, a gap opened between consumer prices and wholesale prices in dairy products. The gap closed with the start of the social protests in the summer of 2011 (this comparison is presented in the appendix of this chapter).

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[24] In 2003, the German Milchwerke Westfalen EG (Humana GmbH) company failed to include vitamin B1 (thiamine) in a new vegetarian baby formula it began manufacturing. Senior officials in Remedia knew of this and did nothing about it. Furthermore, it retained the old list of ingredients on the new formula stating that it contained vitamin B1. Five Israeli Health Ministry officials and the then-head of the Ministry's National Food Service failed to properly check the documents and contents before releasing the Remedia baby formula for distribution. The new formula resulted in the deaths of three infants and the severe injury or potential severe injury of more than 20 others. This became known as the Remedia Affair.

[25] In 2014, the Locker Committee recommended allowing parallel import of non-sensitive dry food products (the Cornflakes Reform).

[26] That purchase yielded a high return for the Apax Partners when, in 2014, Tnuva was sold to the Bright Food Company.

Figure 9
Return on capital in manufacturing and food industries*
as a percent of capital in the industry
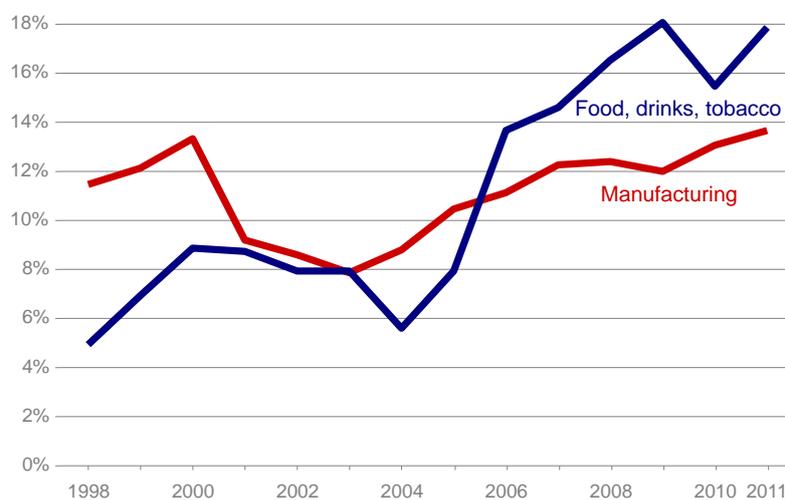
* With depreciation

Source and Data: *Bank of Israel Report 2014*

Figure 10 presents a comparison of food products by their share of total household expenditure on food (the vertical axis) compared to the rate of imported food in the group (the horizontal axis). As can be seen, in the food groups with higher consumption levels, import levels are relatively low. Most of the private expenditure on food in Israel is in the categories of flour and grains, meat and meat products, fresh fruit, milk and dairy products, and light beverages – groups for which import levels are very low. Conversely, food categories where import levels are higher, such as sugar and sugar products and fish, occupy a relatively small segment of the total private expenditure on food. This means that the majority of the food basket depends mainly on local manufacturers.

Figure 10
**Food category import rate and its share of total
food expenditure, 2011**
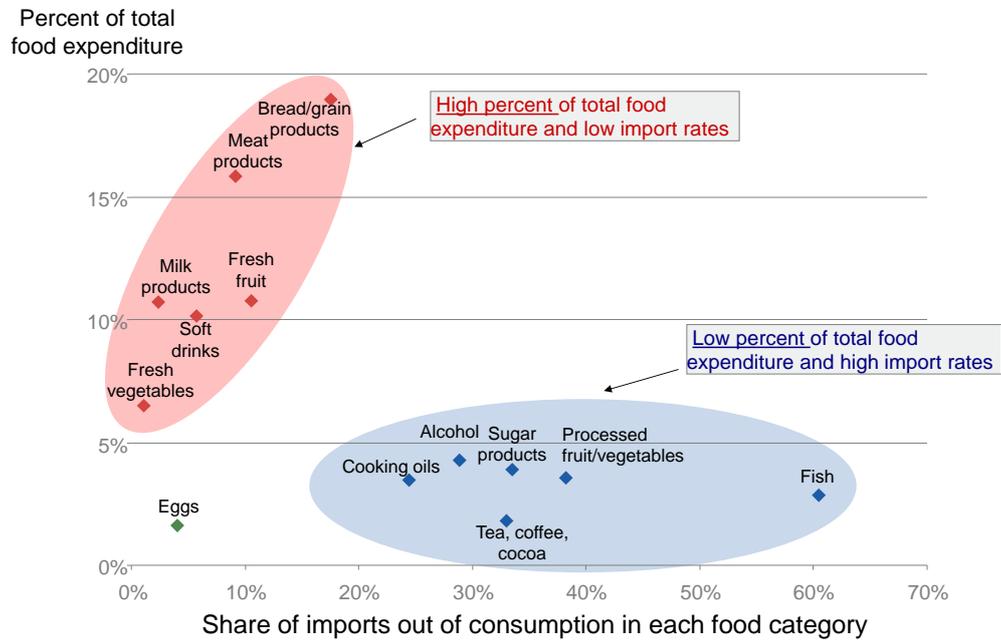
Source: Eitan Regev, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

4. Conclusions

A comparison of private consumer prices over time compared to per
capita product produces supporting evidence to the finding that price
levels in Israel have been high by international comparison for many
years. Since high price levels not only characterize the years of the
appreciation of the shekel after the outbreak of the world crisis in 2008, it
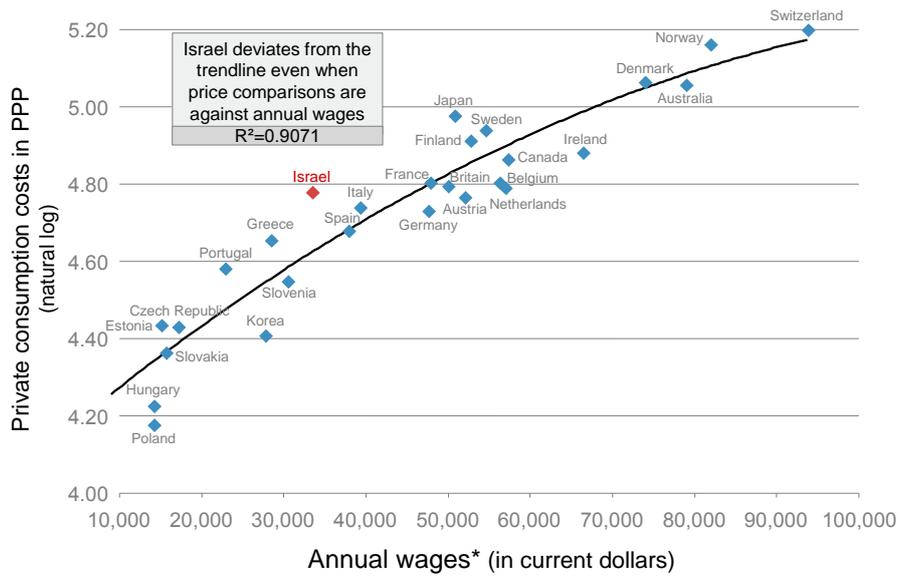
is apparently a phenomenon that is connected to structural factors of the economy and does not derive mainly from the appreciation of the shekel.

A look at the various components of consumption finds that a large part of the price rise that occurred in Israel in the early 2000s derived from the prices of non-tradable products, such as food and housing. The rise in the prices of the tradable products was more moderate, and in consumer categories that were exposed to imports – such as clothing and shoes, furniture and household goods – there was actually a significant price drop. However, in the food industry, where the levels of import are relatively low, there was a relatively rapid rise of prices, apparently because of a change in the structure of local competition. These findings, as well as those in previous studies on the subject, indicate the importance of continuing to expose the economy to imports as a means of increasing competition, reducing prices, and improving consumer welfare in Israel.

It is important to emphasize that the comparison of the consumer prices in Israel to prices abroad is not without methodological problems, and its results depend to a large extent on the level of the exchange rate. As a result, the development of consumer prices needs to be examined over a long time period rather than in a given year. The examination presented here is the first attempt, to the best of the author's knowledge, to look at price levels in Israel over many years, but even this examination relies on assumptions. This constitutes only supporting evidence, and there is still a need for further research on the subject. Likewise, the structural factors that weigh heavily on the cost of living should be examined. The committees established to examine competition in the food industry and in the import sector are examples of positive steps taken in that direction. At the same time, it should be noted that increasing competition in the local market is not limited to exposure to competitive imports, and it is necessary also to prevent the exploitation of market power by dominant producers and guarantee an adequate degree of competition in the marketing chains.

Appendix

Appendix Figure 1

Relation between private consumption costs and annual wages, 2011

28 OECD countries

Israel deviates from the trendline even when price comparisons are against annual wages
$R^2=0.9071$

Private consumption costs in PPP (natural log)
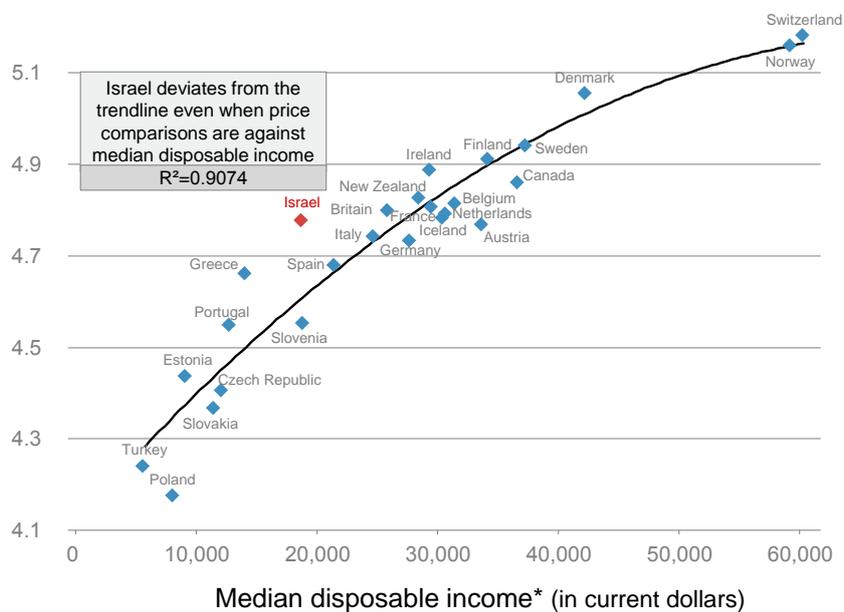
Annual wages* (in current dollars)

* Gross wages for employed person

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat

Appendix Figure 2

**Relation between private consumption costs and
median disposable income, 2011**

26 OECD countries

*   Median disposable income according to OECD definition

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat

Appendix Figure 3 shows the development of consumer prices of milk and dairy products and the wholesale prices represented by the Industrial Production Index of dairy products and ice cream. It can be seen that from 2005 to 2008, the wholesale prices and the consumer prices developed in the same way. In 2009, a gap opened between the prices which closed with the start of the social protests in the summer of 2011. This comparison was first presented by Friedman (2012). The figures after 2013 are not presented here because of the change in the categorization of economic industries made that year.

Appendix Figure 3
**Wholesale prices and consumer price of milk and milk products
2005-2012**
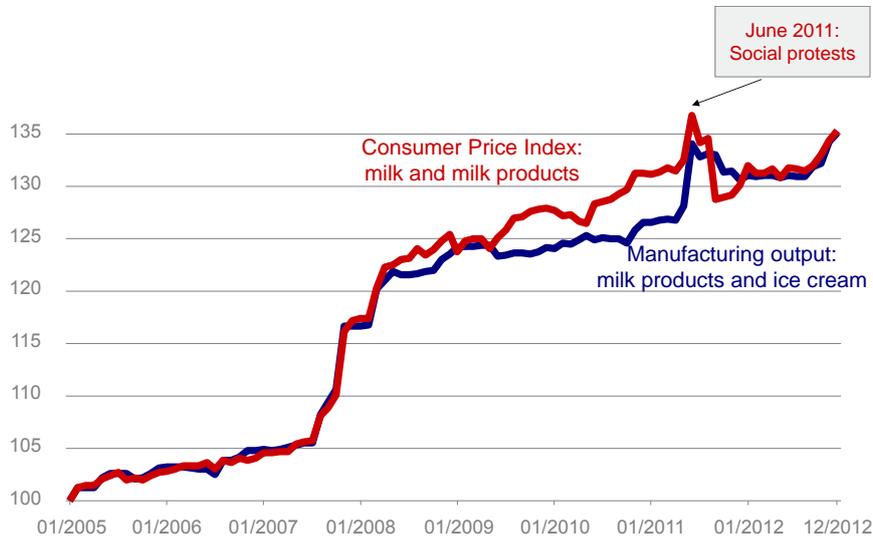
Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

Appendix Figure 4 presents the price ratio between a local consumer basket in shekels and a consumer basket in the US in dollars (the red curve), and the dollar/shekel exchange rate (the blue curve). The comparison of consumer prices between countries was made by division of the ratio of basket prices by the currency rate. When the blue curve is lower than the red one, Israel is more expensive than the US, and vice versa. As of 2014, an exchange rate of NIS 4.35 to the dollar was needed so that private consumer prices in Israel would be identical to consumer prices in the United States.

Appendix Figure 4
Exchange rate and exchange rate of consumer prices*
US dollars, 1990-2014
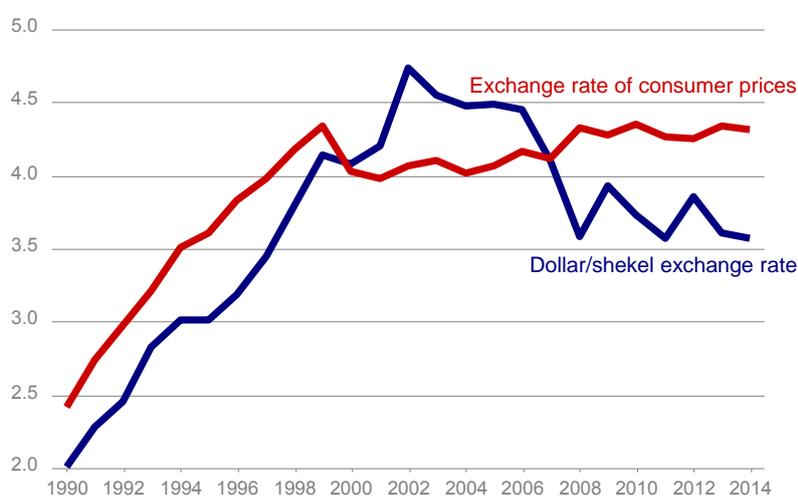
* Ratio between price of local consumer goods basket in shekels and consumer basket in the US

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD Stat

Appendix Table 1.   **Results of the estimate of the log consumer price using per capita GDP, 2014**

32 OECD countries (without the US and Luxembourg)

Category	Value
GDP per capita/10^3	0.026
Standard deviation	(0.002)*
GDP per capita squared/10^7	-0.001
Standard deviation	(0.000)*
Constant	3.91
Standard deviation	(0.049)*
Root MSE	0.079
Sample size	32
R-squared	0.923
Mean GDP per capita (in current US dollars, thousands)	39.29
Standard deviation GDP per capita	21.13
Mean PPP for private consumption	107.40
Standard deviation PPP for private consumption	28.96

*   Statistical significance level of less than 1%

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: OECD

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