

throughout the country. Competitors were allowed to supply relatively expensive services, mainly messenger services, express, registered, and international mail, and despatch of items weighing 500 grams or more. With regard to other services, including regular mail and mass mailings, the Postal Authority retained exclusive rights.

### 5. Construction

Construction activity contracted in 2002 for the fifth consecutive year. Output, product, and the number of building starts all fell, albeit at slower rates than in previous years, although the number of building permits issued remained stable. The industry’s share of business-sector product continued to decline, however.

*Residential construction:* activity declined in 1998–99, primarily for long-term reasons, i.e., the need to downsize due to the lower population growth rate in the post-mass immigration period. This process appears to have come to an end, as in the preceding decade (1990–2000) the housing stock rose in step with the net increment in households. In 2000 the number of residential building starts soared (by almost 20 percent), equaling the increase in the number of households estimated at that time. Nevertheless, output dipped in 2000 because of the Intifada, and plummeted in 2000:IV. Since then activity has continued to decline, initially because of the supply constraint—a 50 percent drop in the number of Palestinian workers as the Intifada erupted—and later due to the fall in demand, which was the major factor behind the level of activity in 2001. These processes were expressed in a cumulative 30 percent decline in the industry’s output in 1998–2001.

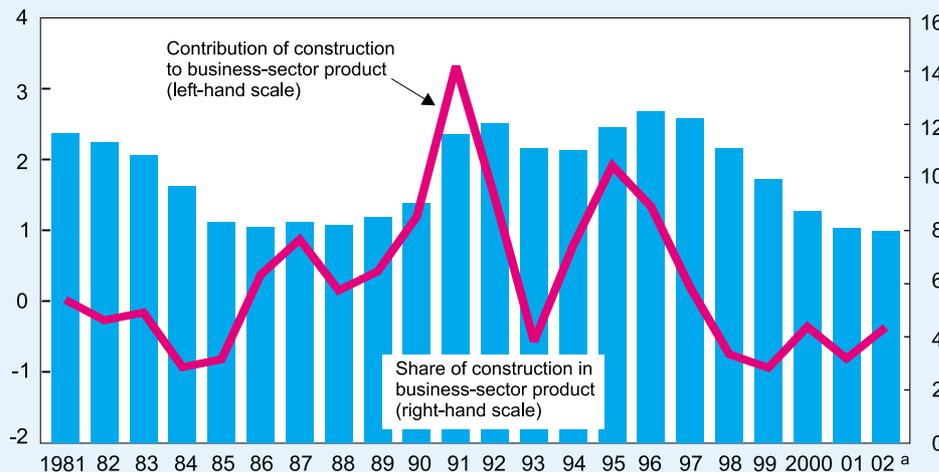
Postal services will be made more efficient once the Postal Authority is organized as a company and the sphere is opened up to competition.

The industry’s output and product declined for the fifth consecutive year.

Residential construction fell relatively steeply; nonresidential and other construction output declined slightly.

The main reason for the contraction of activity in 2002 was the fall in demand.

**Figure 1.39**  
**Direct Contribution of Construction Product to Business-Sector Product, 1981–2002**



<sup>a</sup> In 2002 the definition of construction product changed and equipment installation was included. As a result, the data relating to construction product were amended relative to 1986, so that the data shown here differ from those in previous reports.

SOURCE: Based on Central Bureau of Statistics data.

**Table 1.29**  
**Output and Product in Construction, 1986–2002<sup>a</sup>**

	Annual average change (percent)											
	2000	2001	2002	1986–89	1990–95	1996–2001	1997	1998	1999	2000	2001	2002
Total output ( <i>millions of 2000 NIS</i> )	46,274	42,014	40,488	3.3	14.2	-3.4	1.8	-6.5	-10.8	-5.3	-9.2	-3.6
Residential	21,984	19,071	17,848	3.2	13.0	-4.9	0.9	-9.5	-8.2	-10.4	-13.3	-6.4
Nonresidential	20,914	19,689	19,412	5.4	19.1	-2.7	3.1	-3.9	-14.8	-1.8	-5.9	-1.4
Other <sup>b</sup>	3,376	3,254	3,229	-1.3	0.6	4.2	0.5	0.9	-1.7	10.7	-3.6	-0.8
Apartments under construction ('000)	78.3	70.6	63.8		20.8	-5.8	-12.6	-9.9	-9.5	2.3	-9.9	-9.6
Construction time for residential construction (months)	23.5	21.9	23.4	-2.3	1.0	-1.9	5.4	3.3	2.3	4.4	-6.8	6.8
Total area of building starts ('000 of sq. m.)	9,705	7,491	7,525	1.4	22.1	-9.5	-7.7	-13.3	-7.4	6.9	-22.8	0.5
Residential	7,037	5,224	5,291	2.8	21.0	-9.9	-6.9	-13.3	-9.6	13.8	-25.8	1.3
Nonresidential	2,638	2,234	2,267	0.2	23.0	-8.3	-9.6	-13.2	-2.4	-7.9	-14.5	-1.5
Total area of building completions ('000 sq.m)	9,275	8,923	8,189	-0.3	11.9	0.3	28.4	-13.1	-14.9	-5.3	-3.8	-8.2
Residential	6,562	6,176	6,036	1.9	9.8	0.7	27.4	-17.8	-13.9	-1.6	-5.9	-2.3
Nonresidential	2,712	2,747	2,153	-5.8	17.1	-0.4	31.0	-1.6	-16.9	-13.3	0.1	-21.6
Residential starts ('000)	45.6	31.6	31.5	-1.3	24.2	-12.9	-9.5	-17.5	-13.3	18.6	-30.5	-0.5
Residential completions ('000)	43.3	38.9	37.9	-2.6	9.4	0.3	28.8	-20.4	-14.1	-6.5	-10.0	-2.6
Apartments offered for sale ('000)	30.8	25.3	22.1		13.2	-2.7	1.6	-6.1	-8.5	7.1	-17.8	-12.8
Change in construction product				5.5	13.2	-2.7	1.6	-6.1	-8.5	-3.6	-9.3	-4.5

<sup>a</sup> Calculated from unrounded figures.

<sup>b</sup> Includes defense construction and an estimate of maintenance.

SOURCE: Based on Central Bureau of Statistics data.

The downward trend of activity persisted in 2002—albeit at a more moderate rate than in the previous years. The underlying factors determining demand for housing in the long run—permanent income and the population growth rate, especially the increment in households—also declined in 2002, and were augmented by transitory factors.

Construction output<sup>32</sup> dipped by 3.6 percent in 2002.<sup>33</sup> The decline in activity in the industry caused a fall in the output of the industries producing inputs for it (see section on manufacturing).

The decline in residential construction was relatively steep, 6.4 percent; the output of nonresidential and other construction output (including defense) dipped more moderately. Despite the fall in output, the total area of building starts and of residential construction rose slightly in 2002, reflecting expectations that construction activity would stabilize in two or three years. The current level of activity in the industry appears to be lower than that derived from the effect of long-term factors, and may comprise an element of over-reaction to these factors.

*Nonresidential construction:* the decline in business-sector product, excess capacity, and increased cost of raising capital appear to have led to a decline in the demand for investment.<sup>34</sup> The factors underlying the demand for nonresidential construction contracted sharply: the business sector shrank appreciably, for the second year in succession, alongside a decline in investment in fixed assets. The area of completions of nonresidential construction declined by a steep 21 percent, possible because of the current surplus of constructed area. Notwithstanding, output dipped only slightly. Expectations, reflected in the rise in building starts, also appear to indicate stability. For the first time the share of nonresidential construction output in total construction output was significantly higher than that of residential construction output.

The product of the construction industry dipped by 4.5 percent in 2002, exceeding the decline in business-sector product. The number of persons employed fell by a total of 7.5 percent, together with substitution between Israeli workers, whose number rose by 1.5 percent, and other workers, whose number declined. The adjustment of the work force to the reduction in activity was expressed by a rise in labor productivity and the stability of TFP.<sup>35</sup>

#### *Residential construction*

There were 31,500 housing starts in 2002, slightly less than in 2001. This figure falls short of the forecast increment in households—between 38,000 and 40,000. The principal reason for the low level of activity was the fall in demand.

<sup>32</sup> Construction output is defined as investment in residential buildings and in the principal industries. It is a multiple of building area under active construction, known as building equivalence, and takes into account the fact that output is created over time.

<sup>33</sup> The decline in output is the result of the fall in area under active construction and in the construction rate, i.e., longer construction time.

<sup>34</sup> We do not have quantitative and price data for the principal industries, so that it is not possible to analyze demand directly.

<sup>35</sup> The reliability of the calculations of productivity is limited because of the quality of the data on labor input or the number of persons employed in the industry.

**Table 1.30**  
**Indicators of Supply and Demand, the Housing Market, 1990–2002**

	Annual average		1990–95	1997	1998	1999	2000	2001	2002
	2001	2002							
Permits for private residential construction	24,953	24,629		4.0	-9.1	-7.2	-3.9	-15.9	-1.3
Number of transactions <sup>a</sup>	95,898	89,381	115,619	-17.9	-8.2	14.4	-5.7	0.2	-6.8
Residential land ( <i>units</i> ) <sup>b</sup>	14,083	14,375	40,333	-17.5	-39.0	53.5	-20.6	-37.3	2.1
Private-sector apartments <sup>c</sup>	14,535	14,297	12,848	-3.7	-11.7	-1.6	-2.1	3.8	-2.3
Housing loans taken by eligible persons	36,525	32,070	51,536	-17.1	-9.9	-2.0	-4.3	-5.2	-12.2
<i>of which</i> Immigrants	8,126	6,746	22,300	-30.7	-32.5	-2.2	-7.9	-9.8	-17.0
Young couples	21,546	20,046	17,631	-5.8	2.5	-9.5	-7.1	-1.8	-7.0
Total mortgage loans ( <i>NIS million, current prices</i> )	17,518	20,043	11,781	3.9	-7.0	13.5	-3.7	-7.2	14.4
<i>of which</i> Nondirected	13,976	15,602	6,310	14.5	-7.9	12.6	-1.4	-1.8	11.6
Average interest on nondirected mortgages of less than 15 years	6.56	5.63		5.0	6.0	6.4	6.88	6.56	5.63
Average interest on nondirected mortgages of over 15 years	5.96	5.90	5.16	5.1	5.9	6.3	6.51	5.96	5.90

<sup>a</sup> By date of implementation of transaction; including new and second-hand apartments, and unrequited gifts to relatives; excluding bequests, apartments sold as part of a farm, protected-rental apartments occupied when the sale went through, some apartments in industrial or commercial buildings sold as a package deal, and the 'Build your own home' program.

<sup>b</sup> According to number of transactions implemented (as distinct from those offered) excluding units as yet unplanned; data from Israel Lands Administration.

<sup>c</sup> Until 1998, in the 24 largest towns; as of 1998, in the entire country.

SOURCE: Based on data from the Ministry of Construction and Housing, the Israel Lands Administration, and the Income Tax Commission.

Most of the basic factors affecting demand for housing declined: permanent income, as reflected in per capita private consumption, fell; the growth rate of the population slowed, because the number of immigrants went down; the rate of increase of the number of households declined significantly because of the fall in the marriage rate.<sup>36</sup> In addition, the increase in the risk of owning an apartment rose because of the combination of the security situation and the low tradability of this asset.

Nevertheless, as stated, several factors worked in the opposite direction: the reduction of the mortgage interest rate in the first half of the year by almost 1 percentage point, to a relatively low level, served to increase demand.

In addition, local-currency depreciation, and in particular the lack of stability in the foreign-currency market, caused purchases to be brought forward. The underlying rationale was that apartment prices are inelastic with regard to the dollar exchange rate in the short run (though only partly so, as explained below), creating fears that prices would rise.<sup>37</sup>

<sup>36</sup> The rate was down by 20 percent in the first half of 2002 from the equivalent period in 2001, signifying 6,000 fewer potential households in 2002.

<sup>37</sup> Housing prices in Israel are generally quoted in dollars.

Another possible cause of the increase in demand was the relatively low return on and instability of financial markets, which was sufficient to impel the public to prefer real assets. Although this preference may not necessarily be diverted to the domestic market, as the public has access to real-estate markets abroad,<sup>38</sup> it is reasonable to assume that the home-bias investment preference channeled part of this demand to the domestic market. Another factor working to increase demand in 2002 was the tax reform, which left income from rent untaxed<sup>39</sup> while imposing taxes on alternative channels of financial investment (from the beginning of 2003).

### *Prices and quantities*

There was an annual average rise of 5.6 percent in the housing services market (renewal of rental contracts), even though the main factor affecting demand—permanent income—declined. The real price of owner-occupied housing remained stable, however, despite indications of a fall in demand—a significant reduction in the numbers of transactions and mortgages taken up. On the basis of these developments it would seem that the supply side has an effect in the short run, too; although it is generally accepted that in the housing market supply is inelastic in the short term, so that prices are determined by demand, a deviation from long-term equilibrium could exert pressure on prices in the short term. Consequently, the incremental housing of the last two years, which is less than the increase in households, could exert pressure on prices, offsetting the impact of the drop in demand on the housing services market as well as on the price of owner-occupied housing.

Data and prices for the owner-occupied housing market indicate a decline in demand, with wide variance between the two halves of 2002.

Demand rose in the first half of 2002, expressed in an increase in both prices and the number of transactions. The explanation for this appears to lie in the low real interest rate and local-currency depreciation, as described in detail below. The area of building starts<sup>40</sup> rose significantly in this half. Output continued to fall despite the increase in demand, apparently because of supply-side constraints, among them the time it takes for the industry to respond to higher demand—as is borne out by the data obtained in the Bank of Israel's Companies Survey. Another possible explanation is that the rise in demand is perceived as only temporary, and hence there is no adjustment on the production side.

Demand fell in the second half of 2002, as reflected in the 5 percent decline in the real price of apartments (compared with a 3.1 percent increase in the first half), and a 16 percent fall in the number of transactions. Total housing loans were down by 34 percent, and there was a 4 percent decline in the industry's output in the second half of the year.

<sup>38</sup> As of 2003 the tax exemption on rents abroad has been abolished, making this investment channel far less attractive.

<sup>39</sup> Monthly income of up to NIS 7,000 is tax-exempt.

<sup>40</sup> A 7 percent increase over the equivalent period in 2001, and 17 percent over the preceding six-month period.

Real prices in the housing services market rose, while in owner-occupied housing they remained stable.

Demand for owner-occupied housing rose in the first half of 2002.

Demand fell in the second half of 2002, apparently due primarily to the rise in the real interest rate on mortgages and the cessation of local-currency depreciation.

The main reasons for the contraction of demand appear to be the hike in real mortgage interest, from an average of 5.3 percent in the first half of the year to 5.9 percent<sup>41</sup> in the second half, and the cessation of the trend of local-currency depreciation. The decline in the average interest on mortgages derived from the reduction of short-term interest (up to 5 years), while long-term interest did not go down at all, as an annual average.<sup>42</sup>

*The building repairs industry:* despite the decline in construction output in the last five years, the output of the building repairs industry remained stable, so that its share of the industry's total output rose. Its share in total output was 4.2 percent in 2002, but this may fall short of the actual figure due to reporting inaccuracies.

#### *The supply side*

*Labor:* the number of persons employed in the industry declined as a result of the 17.8 percent fall in the number of non-Israelis (foreign and Palestinian workers) employed. This was partly offset by the slight increase—1.5 percent—in the number of Israelis employed. A total of 1,700 Israeli workers was added to the industry, while the number of posts of non-Israelis fell by 18,200. On the face

of it this would seem to be a low substitution rate, but since the decline in the industry's output was due to the drop in demand rather than to supply-side factors, the substitution rate is higher.<sup>43</sup> Research on the substitution rate between Israeli and Palestinian workers in construction shows that in the 1980s this was 0.95—an extremely high figure.<sup>44</sup>

These data contradict the widely-held view that non-Israeli workers complement Israelis, so that reducing their number will inevitably cause the dismissal of Israelis. Note that this trend of substitution, albeit at a lower rate, began in 2001.

*Capital:* the capital stock of construction equipment has been rising rapidly in recent years (see Box 1.9), although investment declined in 2002.

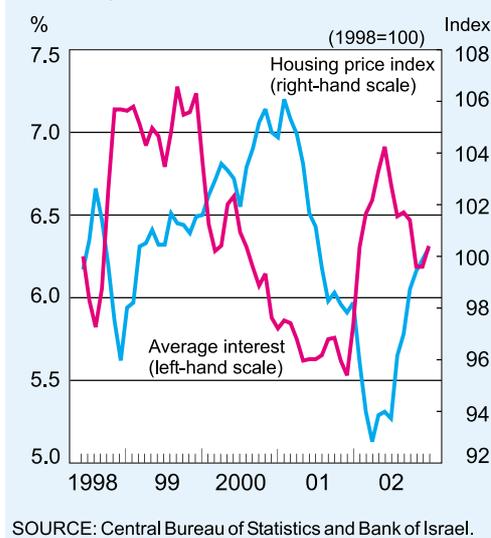
<sup>41</sup> The elasticity of demand with respect to interest is estimated as being high. See Z. Eckstein, A. Barnea, and M. Perlmann, "The Demand for Credit in the Housing Industry," Bank of Israel, *Discussion Paper* no. 98.01 (Hebrew).

<sup>42</sup> Despite the decline in the interest rate, the trend shift towards floating-rate mortgages continued in 2002.

<sup>43</sup> In 1997–2002 (with the exception of 2000) this substitution rate was 0.9.

<sup>44</sup> N. Zussman and D. Romanov, "Substitution of Israelis by Foreign Workers in Construction: The Situation and its Political Implications," (unpublished, Hebrew).

**Figure 1.40**  
Average Interest on Mortgages  
and the Housing Price Index,  
May 1998 to November 2002



Employment in the industry contracted sharply, with substitution between Israelis, whose number rose, and non-Israelis.

*Production costs:* the real wage of workers in the industry declined by 2 percent in 2002, less than other industries (see Chapter 2). This is explained by the fact that foreign workers' contracts are in dollar terms, so that their real wage rose. The wage per employee post of Israelis declined by 7 percent. The index of input prices (which includes wages) went up by 4.4 percent, because of local-currency depreciation, which caused wages to rise in nominal terms, pushed up the price of construction materials (40 percent of which are imported), and generated a steep increase in transportation costs.

Prices of apartments rose more steeply in 2002 than those of inputs, so that the change in the relative price served to increase activity.<sup>45</sup>

*Finance:* the credit/output ratio, indicating repayment ability, continued to rise. The result could be credit rationing and/or the increased cost of credit to contractors. The deterioration of the financing situation in 2002 is also indicated by the data in the Bank of Israel's Companies Survey. Thus, the rise in total production costs could exceed that in the index of input prices.

*Policy:* in the long run, since the State controls the supply of land, the land sales policy is the factor which most influences the supply side. The amount of land sold for residential purposes rose by 2 percent in 2002; since land is sold according to minimum price tenders, and there is no defined quantitative target, the shift may also reflect a change demand.

Residential construction time rose significantly in 2002, especially for government-initiated housing.

### *Housing prices*

Housing prices deflated by the CPI<sup>46</sup> fell by 0.4 percent and rose by 1.7 percent deflated by the CPI excluding housing, although in dollar terms they fell more steeply, by 6.5 percent. In the short run, i.e., during the year, housing prices rose, apparently in line with the exchange rate.<sup>47</sup> This is not the case in the longer run, as is indicated by the steeper decline in prices in dollar terms. In the last five years housing prices have fallen by a total of 25 percent relative to the dollar.

Prices of apartments fell more moderately than the CPI, though more steeply than the dollar.

The elasticity of prices relative to the exchange rate against the dollar was also apparent in the market for new homes: although prices are given in dollars in most advertisements for apartments, the exchange rate offered by contractors was far lower than the representative rate.<sup>48</sup>

Indexation to the dollar still prevails in rental contracts. Legislation requiring rents to be determined in local currency<sup>49</sup> passed its first reading by the Economic Committee of the Knesset in 2002. The law proposes banning indexation of rents to a foreign currency, but permitting linkage to another index.

<sup>45</sup> Assuming that the expected price is the current price.

<sup>46</sup> The price of owner-occupied housing may change, as it is updated ex post.

<sup>47</sup> The source of the increase in prices may be the interest rate, the reduction of which caused asset prices to rise.

<sup>48</sup> See *Monthly Information*, Ministry of Construction and Housing, November 2002 (Hebrew).

<sup>49</sup> The Pines-Galon proposal to quote housing prices in NIS.

**Table 1.31**  
**Factor Inputs and Productivity in Construction, 1986–2002**

	2001	2002	Annual average change									
			1986–89	1990–95	1996–01	1996	1997	1998	1999	2000	2001	2002
Total employees ('000) <sup>a</sup>	220.3	203.8	2.3	10.1	-0.5	8.0	4.8	-1.9	-3.3	-3.3	-6.7	-7.5
Total												
Israelis	117.0	118.7	-0.2	12.4	-3.4	4.4	-2.5	-10.4	-8.4	-3.2	0.3	1.5
Palestinians	29.0	13.0	6.0	-6.3	-4.4	-12.9	28.1	42.5	7.1	-8.8	-50.8	-55.2
Foreign workers	74.3	72.1			8.5	36.5	10.1	-11.3	-2.8	2.5	22.8	-3.0
Construction equipment capital stock (NIS million, 2000 prices) <sup>b</sup>	11,112	11,645	-4.6	11.2	11.3	19.9	13.6	10.8	8.6	7.3	8.3	4.8
Cement sales ('000 tons)	4,345	4,379	2.9	18.1	-5.9	-9.8	-2.4	-7.8	-4.8	-7.0	-3.5	0.8
Labor productivity <sup>c</sup>			4.8	0.7	-2.1	1.1	-3.3	-3.3	-3.5	-1.1	-2.3	-3.9
Real wage per employee post <sup>d</sup> (2000 prices)	5,836	5,716			1.5	-2.9	4.0	2.0	5.6	3.8	-2.0	-2.0
Total factor productivity <sup>e</sup>			5.6	0.8	-3.9	-0.4	-4.5	-5.5	-5.7	-2.7	-4.8	-0.7

<sup>a</sup> Includes an estimate of unreported foreign workers.

<sup>b</sup> Capital stock at beginning of year.

<sup>c</sup> Product per hour worked weighted by capital and labor: average weight of labor, 84 percent.

<sup>d</sup> In private construction.

<sup>e</sup> The definition of the construction industry changed in 2002, and the equipment erection industry was added. As a result data from previous years was changed, and the data herein differ from those shown in previous reports.

SOURCE: Central Bureau of Statistics.

The price of housing services, as measured in the CPI (renewal of rental contracts) rose by 12 percent, despite the decline in the principal component of demand—income. The contraction of supply, expressed in a fall in completed apartments for four years in succession, may have been the deciding factor in this.

In the last five years apartment prices have fallen by a cumulative 13 percent in real terms, while rental prices have risen at a similar rate. This trend differs from the historical one, since as a long-term average, the return on rents in Israel has been low and apartment prices have risen.

### Box 1.9

#### The Mechanization of the Construction Industry; Long-Term Developments and an International Comparison

The construction industry appears to have been undergoing mechanization in the last few years. Below we present the development of capital stock in the industry, comparing Israel with some of the countries of the OECD.<sup>1</sup> An

<sup>1</sup> The source of the data (other than for Israel) is OECD, Structural Analysis Industrial Database (STAN), 2002.

earlier comparison, based on 1994 data,<sup>2</sup> indicated that Israel's low labor productivity is due entirely to the low level of mechanization, reflected by the low capital/worker ratio, so that in effect production is efficient. A comparison with data for 2000 shows that despite the high level of investment in recent years, capital stock per worker is still very low in Israel, as is product per worker.

*The development of mechanization*

The relatively high level of investment in construction equipment in the last decade raises the possibility that during that period the mechanization of the industry increased significantly; moreover, investment has remained high over the last few years, when the industry's output declined by 30 percent.

The development of capital stock in construction indicates that there is substitution between capital and labor: capital stock declined substantially in two periods, 1967–68,<sup>3</sup> and 1982–90. The reason for this, in addition to the contraction of activity, is the availability of cheap labor.<sup>4</sup>

As the figure shows,<sup>5</sup> 1991 constituted a turning-point in investment in construction equipment, and since then the industry has displayed a high rate of annual investment even though activity in it has continued to decline

**Figure 1**  
**Capital Stock of Construction Equipment, 1960–2003**



SOURCE: Central Bureau of Statistics.

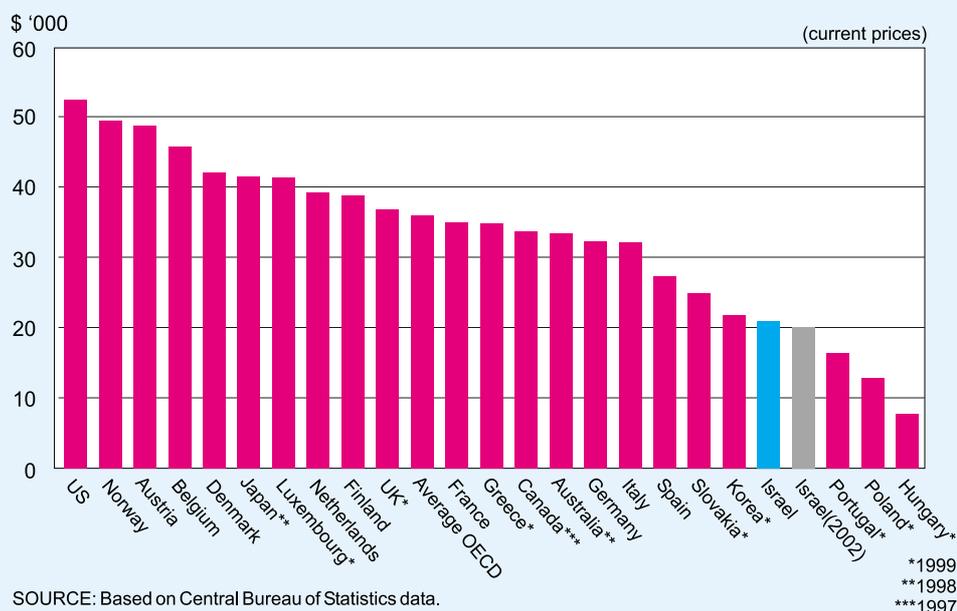
<sup>2</sup> *The Production Function of the Construction Industry, and the Mechanization of Construction*, 1998, Applied Economics Co. Ltd., for the Ministry of Construction and Housing. The study is based on output per worker only. The comparison here relates to product per worker, too.

<sup>3</sup> The decline in capital stock in 1967 was the result of the low level of investment in 1966, and can hence be attributed solely to the recession that prevailed then.

<sup>4</sup> In the 1980s the number of Palestinian workers in the industry soared.

<sup>5</sup> The capital stock of the industry includes construction equipment only. The assumption is that the lifespan of this equipment is 10 years.

**Figure 2**  
**Product per Worker in Israel and OECD Countries, 2000**



(from 1998). The number of persons employed<sup>6</sup> in the industry has been declining for five successive years. It appears, therefore, that in recent years the industry has undergone a process of mechanization, expressed in substitution between capital and labor. In effect, capital per worker was twice as high in 2002 as in 1994. Note, however, that the replacement ratio indicates a downward trend in the last few years, so that the average age of capital stock is rising.

The high level of investment in the first half of the 1990s is explained by the increase in economic activity,<sup>7</sup> and hence there was no mechanization process in the industry, though there was growth. In the second half of the decade, however, investment rose despite the contraction of activity in the industry, and even though in those years there was another source of cheap labor—foreign workers.

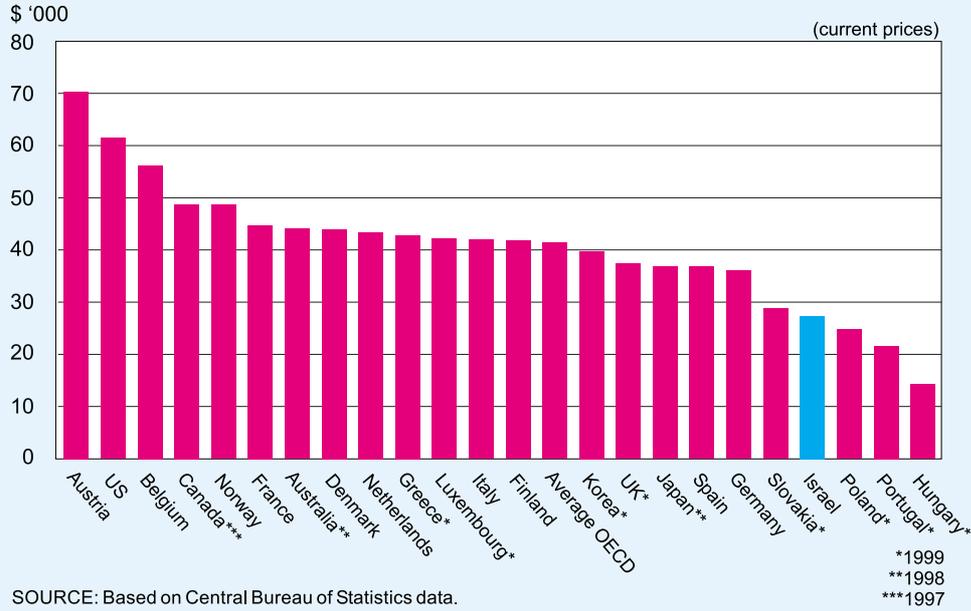
Investment in equipment may have become more worthwhile as a result of the change in the relative price of investment goods—a rise in the real wage and a decline in labor productivity (for six successive years),<sup>8</sup> on the one hand, and a decline in the real price of investment goods, on the other.

<sup>6</sup> The total number of persons employed includes Israelis, and foreign and Palestinian workers.

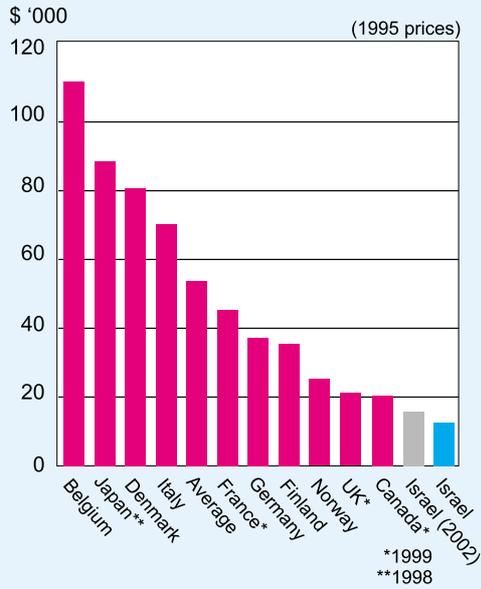
<sup>7</sup> In 1990–95 the growth rate of capital stock was similar to that of the number of workers and output (see Table 1.31).

<sup>8</sup> See section on supply side for a discussion of the problematic nature of these data.

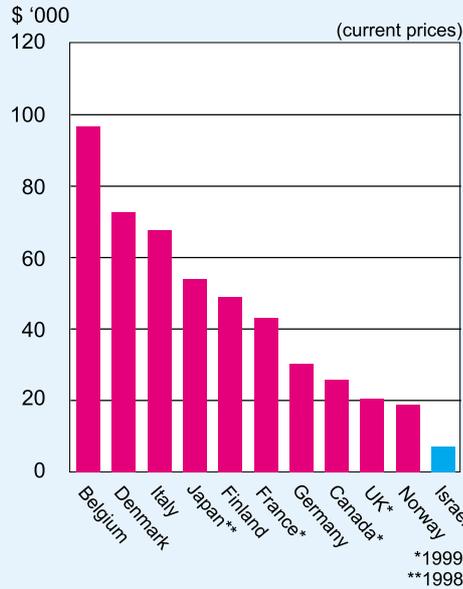
**Figure 3**  
Product per Worker in OECD Countries, Adjusted by PPP, 2000



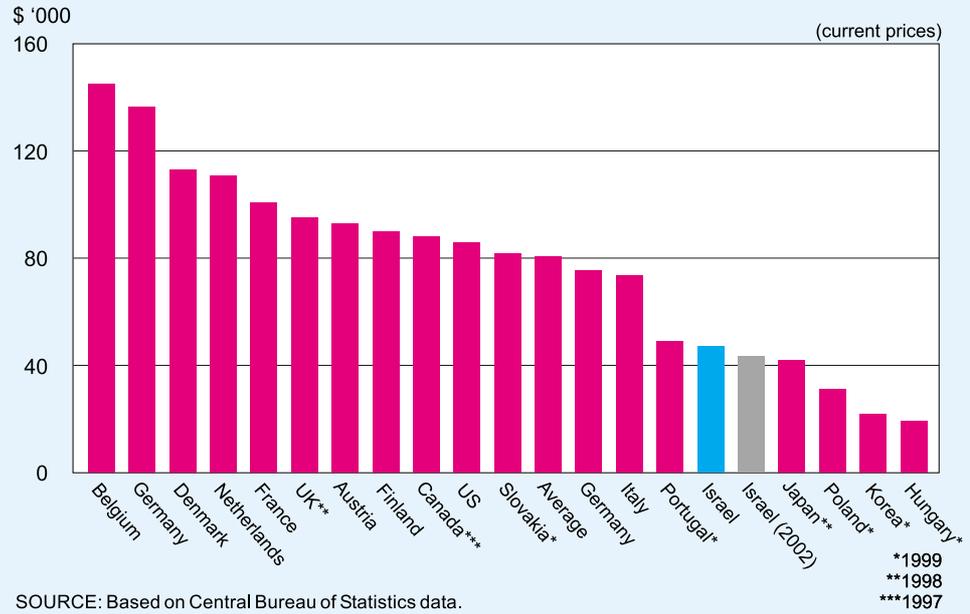
**Figure 4**  
Capital per Worker in Israel and OECD Countries, 2000



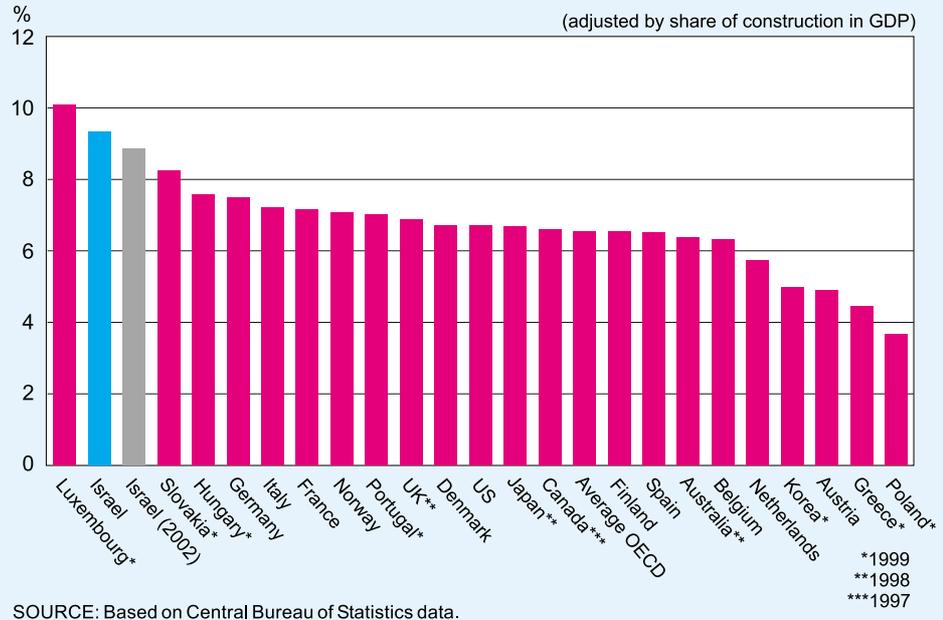
**Figure 5**  
Capital per Worker in Israel and OECD Countries, 1995



**Figure 6**  
Output per Worker in Israel and OECD Countries, 2000



**Figure 7**  
Share of Employees in Construction in Israel and OECD Countries, 2000



Other possible explanations of the process of mechanization are the upward trend in the share of nonresidential construction output at the expense of residential output, and the concentration of construction in large sites, such as the new town of Modi'in. A study of the worthwhileness of mechanization found that the overall size of a project (rather than of an individual building) was one of the determining factors.<sup>9</sup>

The rapid rate of investment in the last few years raises the question of the extent to which the industry has closed the large gap in mechanization between Israel and other countries.

#### *An international comparison*

In order to examine the way the industry produces, we compare the use of factor inputs—capital and labor<sup>10</sup>—and product per worker in Israel and the OECD. The comparison is problematic because the product is both nontradable and very heterogeneous.

The comparison could be biased because of differences between countries as regards general price levels. High productivity in tradables will cause real local-currency appreciation, expressed in an increase in the price of nontradables (the Harrod-Balassa-Samuelson effect), including construction, which does not reflect a high level of productivity in nontradables. In order to avoid a bias of this kind, output per worker was adjusted for the purchasing power of investment goods.<sup>11</sup> In comparing PPP in Israel and other countries we have no way of ascertaining whether the gap stems from a difference in the productivity of tradables or of nontradables; we therefore compared PPP adjusted and original data. The data for capital per worker were not adjusted, as this capital is highly tradable,<sup>12</sup> and it is assumed that absolute PPP holds in this respect.

As regards the heterogeneity of the product, the characteristics of construction in Israel<sup>13</sup> differ from those in the OECD, with residential construction accounting for a high proportion of construction in Israel, and

<sup>9</sup> Thus, for example, in the construction of six-storey buildings in a project comprising more than 48 housing units it is worthwhile going over to mechanized construction, while in the construction of 3-storey buildings the minimum size of a project in which mechanization is worthwhile is 96 housing units; see, S. Engel (Engineering), Ltd., Hizokol Ltd., Ministry of Construction and Housing (2001), *An Economic-Pricing Model of the Worthwhileness of Shifting to Mechanized Residential Construction* (Hebrew).

<sup>10</sup> Due to data limitations the comparison here ignores the ratio of input purchases per worker, which constitutes a substitute for capital and labor. For example, concrete can be mixed at the site by a concrete-mixer and a worker, or purchased as a ready-mix.

<sup>11</sup> Source, A. Heston, R. Summers, and B. Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

<sup>12</sup> In 2000 and 2001, an average 80 percent of investment in construction equipment in Israel was imported.

<sup>13</sup> See note 2 in this box.

only a small proportion of it of one-storey homes. Nonetheless, the production function of the construction industry in Israel appears to be similar to the average in the OECD; thus, the substitution of the industry's factors of production in Israel and the OECD shows that their actual and potential product are very close. For this reason, as well as data limitations, the comparison here does not take the heterogeneity of the product into account.

### *Results*

Despite the accelerated pace of investment in recent years, capital stock per worker in Israel's construction industry is still very low by international standards, and is about half the average in the countries examined. Part of the explanation for this is that the ratio of capital per worker has also risen in those countries since 1994. There are indications that there is substitution between capital and labor in the other countries too: the level of capital per worker is relatively low in countries which are more open to immigration, such as Canada and Germany, and higher in countries with a more restrictive policy, e.g., Belgium.

The employment rate in the industry is higher than in the business sector as a whole, even after adjustment for the industry's relative weight in business-sector product, thus complementing the result obtained by examining capital per worker. Israel's construction industry appears to produce using a large number of workers and low capital stock, probably because of the low relative price of labor in Israel.

Product per worker in Israel is still low, however, and the product/worker ratio in Israel is about half the average in the countries examined. Adjusted for PPP, the picture is slightly better (see figures).

This does not necessarily mean that the industry is not efficient; in principle, the low product/worker ratio could be the result of low capital stock, so that production is in fact efficient.<sup>14</sup> The gap between Israel and other countries seems to be excessive, however,<sup>15</sup> (and it naturally depends on the method used to measure product per worker), so that in any event the industry does not produce at the average efficiency level of the countries examined. This should be qualified by adding that the industry may make efficient use of the factors of production available to it, but its product is small because of factors that are exogenous to the industry, such as a bad transportation network that incurs high costs, a monopolistic market for

<sup>14</sup> This is the conclusion that arises from the study cited in note 2 but, as stated, it examined only the output/worker ratio.

<sup>15</sup> This is done by using published coefficients of the production function; note that even in countries where the industry is mechanized it is still labor-intensive.

raw materials (e.g., cement and floor-tiles),<sup>16</sup> and other factors that reduce the industry's 'producer surplus.'

The period examined was one of recession, when construction product declined. Since there was not full adjustment between factors of production, productivity fell in those years, so that the comparison is biased by the business cycle. Once the industry recovers, the picture obtained from a comparison of this kind may be better.

<sup>16</sup> The cement market is highly concentrated; the floor-tile market has been dominated by a cartel for many years.

### **Box 1.10**

#### **The Ministry of Construction and Housing's Aid Plan in 2001 (The 'Sharansky Program') and its Effect**

Against the backdrop of the steep decline in the activity of the construction industry in the first half of 2001 and the rise in the stock of unsold new apartments, it was decided to implement a government program to increase demand. The Ministry of Construction and Housing's plan (the 'Sharansky Program,' or the plan to provide an opportunity to buy an apartment) set out four possible paths for providing temporary assistance in purchasing a home, primarily to eligible persons (see below). The original program was in effect between 17.06.2001 and 16.10.2001, but was extended, under less favorable conditions,<sup>1</sup> to the end of 2001. The four assistance paths were as follows:

1. In settlements in national priority areas A and B, and in Jerusalem—NIS 50,000 as an indexed loan at 4 percent interest for 25 years to eligible persons, upon purchase of a new or second-hand apartment or building their own home.

2. In selected towns an aid supplement of NIS 50,000, half as a grant and half as an indexed loan at 4.5 percent interest for 20 years to eligible persons, only for purchasing a new apartment.

3. In Ashkelon and Beersheba— an aid supplement of NIS 10,000, half as a grant and half as an indexed loan at 4.5 percent interest for 20 years to eligible persons, only for purchasing a new apartment

4. In two outlying suburbs of Jerusalem—an aid supplement of NIS 100,000, half as a grant and half as an indexed loan at 4.5 percent interest for 20 years to all persons, only for purchasing a new apartment

<sup>1</sup> A 10 percent reduction in the amounts of grants and loans at the beginning of November, and a further 10 percent reduction in December.

The effect of the program was examined by comparing the number of transactions and the prices of 3-room apartments<sup>2</sup> purchased by eligible persons in the first and second halves of the year, i.e., before and after the plan went into effect.

This comparison is valid because the relevant background conditions do not appear to have changed, and total demand for apartments was stable throughout the period. Although the average interest on mortgages declined from 6.8 percent in the first half of the year to 6 percent in the second half, the other factors behind demand—per capita GDP and the security situation—had a negative effect. The average of the two halves of the year in the survey of the price of owner-occupied housing showed that this was stable (a negligible 0.6 percent decline).

The results of paths 1 and 2 show that the program significantly increased demand, and there was a steep rise in the number of transactions,<sup>3</sup> as well as in prices: *on average, apartment prices rose in line with the discounted value of the aid supplement.* On the face of it, the result is not consistent with the accepted economic analysis of supply and demand: the sharp rise in quantity supposedly indicates an elastic supply side, which should moderate the price increase. In effect, the rise in the number of transactions reflected a change in stock.

In Beersheba and Ashkelon, too (path no. 3), demand rose, and this was translated into a steep increase in the number of transactions and in prices: the latter exceeded the discounted value of the incremental aid, but on the basis of the rise in the price of second-hand apartments, which were not included in the assistance program, it would appear that the increase in demand was general, so that it cannot be attributed solely to the program. The reason for the rise in demand may have been the implementation of the Negev Law.<sup>4</sup> The effect of path no. 4 was not examined because of data limitations.

The data indicate that the subsidy caused a steep increase in apartment prices, and on average did not benefit purchasers. The prime beneficiaries were contractors—which is hardly surprising in view of the structure of the program:

<sup>2</sup> There are, of course, other parameters that affect apartment prices, such as location, area, storey, etc., and these are not taken into account here. Note, however, that most of these apartments were built at the initiative of the Ministry of Construction and Housing, and hence are relatively uniform as regards quality of construction. The sample in most places includes hundreds of apartments, so that there is convergence to an average apartment.

<sup>3</sup> Once the program ended the number of transactions in the settlements included in paths 2 and 3 and in Jerusalem declined by 47 percent, to a slightly higher level than in the first half of 2001.

<sup>4</sup> The law, which went into effect in April 2001, increased aid to people settling in the Negev.

**Effect of the ‘Sharansky Program’ and its Budgetary Cost, by Aid Program, 2001**

Aid Channel	(annual rate of change, percent)					
	Increase			Capitalized	Total	of which
	In number of transactions <sup>a</sup>	In price (%) <sup>b</sup>	In price (NIS)	value <sup>c</sup> of additional aid (NIS)	expenditure (NIS million)	Subsidy (NIS million)
1	105	2.1	8,000	8,500	443	43
2	260	9	37,000	27,500	127	74
3	123	2.4	20,000	5,500	12	6

<sup>a</sup> The change in the number of transactions and in price relates to three-room apartments.

<sup>b</sup> By a fixed bundle of apartments in the first half of the year (Laspeyres' index).

<sup>c</sup> The average market rate of interest on 20-year mortgages in the period of the campaign was 5.7 percent. The difference between the monthly repayments was capitalized at a long-term interest rate of 5 percent, under the assumption of an imperfect capital market.

SOURCE: Ministry of Construction and Housing.

1. Most of it (paths 2, 3, and 4) afforded additional aid only for purchases of new apartments.

2. The program was in effect for only a short time.

3. One of the criteria for choosing settlements was the large stock of unsold completed apartments.

The first reason ensured that most of the price hike reached the contractors; the second reason guaranteed a lack of supply-side response, i.e., a price rise, because supply-side rigidities were converted into a price rise. Note that the price of second-hand apartments rose too, apparently because of the substitution effect, but this reflects the transfer between individuals without the element of subsidization (other than in path 1, where the subsidy element was relatively low).

A counter-cyclical mechanism appears to generate the creation of programs of this kind. When there is a slump, as a result of a fall in demand, there is under-performance in the Ministry of Construction and Housing's budget which, in contrast with other ministries, does not consist primarily of purchases but is intended to provide assistance in apartment purchases (as grants or credit subsidies), and hence the extent to which it can be controlled is limited. If a situation of under-performance emerges during the year<sup>5</sup> various elements seek to increase expenditure. The outcome is an 'aid program' providing higher than usual benefits for a limited time, in this case till the end of the year. As the table shows, the budgetary cost of the program was indeed significant.

<sup>5</sup> There was under-performance in 2001: in a press release issued on 9.5.2001 the ministry announced that if the rate of mortgages taken up persisted, a surplus of NIS 1.4 billion in the credit and subsidy of mortgages item could be expected.

*The program and the political aims of the Ministry of Construction and Housing*

The declared aim of the Ministry of Construction and Housing is to ensure that households have ‘appropriate housing,’ or, as formulated in the 2003 budget proposal, “The purpose of the activity of the Ministry of Construction and Housing is to create the conditions that will enable the general population to find a housing solution at a reasonable price, while focusing on the weaker segments of the population.” The above analysis indicates that the Sharansky Program was not consistent with these aims (in contrast with the ministry’s permanent aid programs).

## 6. Commerce and services

The deepening of the recession against the backdrop of the Intifada and global economic slowdown impacted on the commerce and services industry. The industry’s product contracted by 2.8 percent in 2002, after remaining stable in 2001. The industry’s nondiamond exports, which account for a third of total exports, fell by 15.7 percent in volume terms.

Services product dipped by 2.8 percent, and by 1.5 percent without start-ups. The short-term factors which account for the decline include the Intifada and the global slump, primarily in the high-tech industry.

The deepening recession in 2002, against the backdrop of the Intifada and global slowdown, impacted on the commerce and services industry. The industry’s product contracted by 2.8 percent in 2002 (Table 1.33), after remaining stable in 2001. The contraction was slightly less than that of the business sector in general, so that the share of the commerce and services industry in business-sector product—51.1 percent—rose slightly. The number of persons employed in the industry also remained virtually unchanged, after rising consistently in the previous 11 years, while in the business sector in general employment declined more steeply. The industry’s exports, which account for about a third of total nondiamond exports, fell by 15.7 percent in volume terms.

The product of the services industry (hotels and catering, business and financial services, education and health businesses, etc.) declined by 2.8 percent in 2002, and by 1.5 percent without start-ups. The rate at which the services industry declined is more moderate than that of business-sector product (both excluding start-ups). Short-term factors behind the decline in services include the Intifada and the global slump, especially in high-tech, which caused the product of computer and R&D services (including start-ups) to fall, and the increase in demand for security guard services. The long-term growth of the services industry’s product is led by the rise in the standard of living, and with it the demand for services. The reduction of government involvement in the provision of health and welfare services, etc. has also led to an increase in the demand for the supply of these services by businesses, as was also the case in 2002.<sup>50</sup> There was no marked change in the share of privately financed education, however.<sup>51</sup> Another

<sup>50</sup> The share of the business sector in national health expenditure rose from 23 percent in 1990 to 28 percent in 2001. Welfare services were privatized partially by the government and the local councils; see J. Katan (2001), “The Partial Privatization of Personal Welfare Services: Dilemmas and Principal Problems,” in J. Kop (ed.), *The Allocation of Resources to Social Services in 2001*, Center for the Study of Social Policy in Israel (Hebrew).

<sup>51</sup> See Box 3.5 in Chapter 3.