

## Chapter 5

# Labor Market Issues

### **The connection between the increase in housing prices and the supply of labor in the past decade by home ownership**

This review discusses the question of whether households that did not own a home during the period of home price increases increased their supply of labor in order to finance the future purchase of a home.

For this purpose, we compared the developments of labor patterns between population groups that should have been differentially affected by the increase in home prices, during which we examined the following questions:

Did the employment rates of individuals who do not own a home increase relative to individuals who do own a home, following the period of price increases?

Did the number of months of work and the real wage of first-time home buyers increase relative to those upgrading their home and those purchasing an investment home, following the period of price increases?

The econometric analysis shows that the supply of labor changed during the period in a differential manner depending on home ownership. Individuals who did not own a home before the price increases increased their employment rates more than individuals who did own a home. Similarly, the number of months of work among households that purchased first homes increased during the period of price increases more than among those upgrading their homes (and those purchasing investment homes), and the real annual wage of the former increased by about NIS 20,000 more than that of the latter. An examination of gender shows that these changes were mostly a result of increased supply of labor among men, while the employment rates and months of work of women remained virtually unchanged.

These findings support the hypothesis that households that did not own a home before the price increases and purchased a home once the prices had already increased financed the purchase by increasing the labor supply, among other things, which increased their real income. At the same time, the labor supply of households that already owned a home before the price increases remained relatively stable throughout the period.

The increase in home and rent prices in recent years has affected the financial state of households differently, depending on whether they own a home.

In recent years, home prices in Israel have increased sharply, affecting the financial state of households. While the increase in home prices has increased the volume of household capital among households that own their homes, it has negatively impacted households that did not own a home, as well as those that purchased a home after the marked increase in home prices. This survey focuses on the ramifications of these developments for the supply of labor in the past decade.

The marked increase in home prices was accompanied by a significant improvement in the terms of financing due to the sharp decline in the interest rates on mortgages.<sup>1</sup> There is an argument that the increase in prices did not really make it more difficult for households to purchase a home, since the more lenient terms of financing offset the effect of the increases in home prices. This argument is misleading, since thanks to the possibility of refinancing a mortgage during periods of lower interest rates, a significant portion of the households that purchased a home before the price increases benefitted from both the price increases and the less expensive financing. This is in addition to the benefit from the decline in interest expenses on the variable-rate portion of the mortgage. In contrast, while those who purchased a home at the end of the period benefitted from less expensive financing, they suffered from the higher prices.

Aside from the higher home prices and the difficulty in purchasing a home, the burden of housing expenses was also reflected in increased rental prices. An examination of the composition of household expenses during the period shows that housing expenses as a share of total household expenses increased mainly among those who do not own a home. This examination was carried out by comparing the composition of expenses of young couples in the Jewish sector (ages 25–39)<sup>2</sup> according to the Expenditure Survey for 2004 and the composition of expenses of such couples in 2014. For this purpose, the “housing attribution” item was excluded from the expenditure basket, and the mortgage item<sup>3</sup> was included. A comparison of the two periods indicates some increase in the portion of expenditures directed to housing among all couples—from 19.8 percent in 2004 to 21.5 percent in 2014. A differential examination of young couples by home ownership shows that this change was derived from a significant increase in the rate of housing expenditure among young couples who do not own a home following the increase in rental prices, an increase from 20.4 percent in 2004

<sup>1</sup> Friedman and Ribon (2014) found that households that purchased a home following the price increase financed the purchase by significantly increasing the mortgage, some increase in equity, and increasing real income. Studies have also found that the rate of monthly repayment of mortgages out of household income did not increase, mainly due to the decline in the average interest rate on mortgages and extending the repayment period. Tzur-Ilan (2015) found that the imposition of LTV limitations on housing loans toward the end of the reviewed period did not lower demand for homes, but only caused it to be diverted to less expensive housing. Households continued to purchase homes despite the limitations that made it difficult for them to borrow, but compromised on the type, location or size of property they purchased.

<sup>2</sup> Young couples are defined in this file as spouses aged 25–39 sharing the same household. The survey relates to the Jewish sector only due to differences in home ownership patterns between the sectors.

<sup>3</sup> This expenditure does not include income losses in respect of equity invested in a home.

to 24.5 percent in 2014—while the rate of this expenditure among young couples who own a home declined slightly during the same period (from 19.6 percent to 18.8 percent).

The question therefore arises as to whether these trends generated a change in labor patterns. To provide an answer, we will focus on young households (aged 25–39) in the Jewish sector. This is due to the relatively high elasticity of the labor supply in this group<sup>4</sup> and the high demand within this group for home ownership, due to which this group is expected to experience most of the difficulty in financing the purchase due to the price increases.<sup>5</sup> The analysis below is based on two sources of data. In each one, the labor patterns of various population groups prior to and after the period of price increases were compared.<sup>6</sup>

The first analysis is based on the Expenditure Surveys for the years 2004–2014. It compares the change in labor patterns following the price increases between individuals who do not own a home and those who own at least one home.<sup>7</sup> Since the date of the home purchase in this file is unknown, individuals who own a home are also expected to increase their supply of labor to a certain extent, because these include individuals who purchased a home toward the end of the price increase period. In any case, Figure 5.1 indicates variance between the two groups in the development of labor patterns from 2009—a sharper increase in the average number of breadwinners among young couples who do not own a home than among those who do.

The second analysis is based on a file of data that does not include full information regarding home ownership, but makes it possible to identify individuals who purchased a home between 2002 and 2013, as well as the timing of the purchase and the type of purchase (first home / investment home / upgrade purchase). This data file is a panel of assessed taxpayers by the Israel Tax Authority, which includes a random and anonymous sample of 10 percent of employed workers in Israel between 2002 and 2013, and also includes data on “residential dwelling transactions” involving those workers (the real estate price cardfile—“Carman”). The data in this file include whether the workers and their spouses worked part time or full time—the annual salary and number of work months in the year; a number of demographic characteristics such as gender, age, marital status and number of children; data on real estate transactions

In order to examine whether households that did not own a home during the period increased their supply of labor, the labor patterns of various population groups were compared, based on whether they owned a home before and after the period of price increases.

<sup>4</sup> Various studies, for instance by Brender and Strawczynski (2006) and Brender and Gallo (2008), showed that elasticity of the labor supply among this age group is higher than among older age groups.

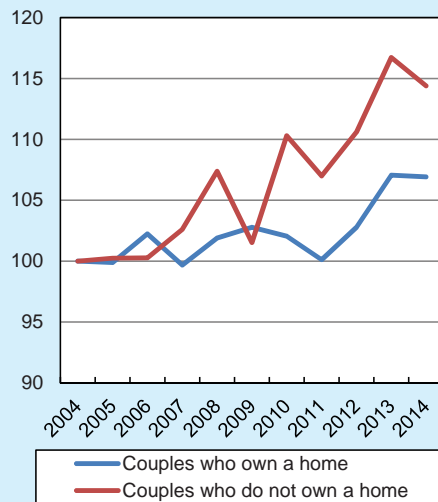
<sup>5</sup> Other studies written on this topic are: Brender and Strawczynski (2014), “Government Support for Young Families in Israel”, Bank of Israel, Research Department, Discussion Paper no. 2014.02; and “First-Time Homebuyers: Changes in Purchasing Patterns 2002–2012, by income level”, in Bank of Israel (2014), Recent Economic Developments, 138

<sup>6</sup> This distribution is based on a change recorded in the pace of home price increases during the period. Home prices taking into account the differences in quality (calculated hedonically, taking into account the size, age and location of the home, similar to the method used by the Central Bureau of Statistics) increased by about 70 percent between 2008 and 2013, after increasing by only about 10 percent between 2002 and 2007.

<sup>7</sup> The Expenditure Surveys for previous years include variables that are defined differently. Therefore, we included only the Surveys from 2004 onwards.

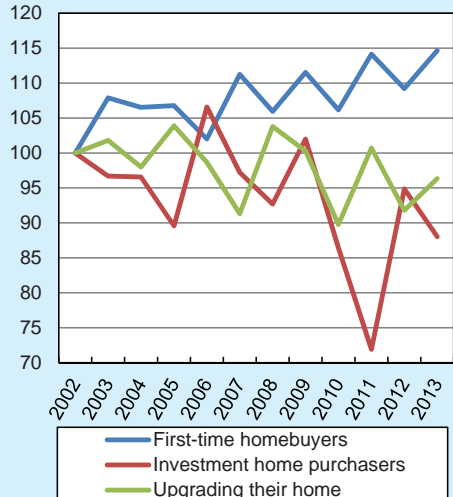
they carried out such as purchase or sale of a dwelling, type of transaction (first home / investment home / upgrade purchase); home price; home area; number of rooms; and the socio-economic character of the location. The labor patterns of first-time home buyers and those purchasing investment or upgrade homes were compared, assuming that first-time home buyers absorbed most of the impact of the home price increases, while those purchase an investment or upgrade home, who already owned a home, were less impacted by the price increases. Figure 5.2 shows that the number of work months of young couples purchasing investment and upgrade homes declined slightly during the period, while the number of work months of young couples purchasing a first home increased.

**Figure 5.1**  
**Number of Breadwinners Among Young Couples, by Home Ownership, 2004–14 (Index 2004 = 100)**



SOURCE: Based on the Central Bureau of Statistics Expenditure Survey.

**Figure 5.2**  
**Number of Work Months for Employed Young Couples Purchasing A Home, by Type of Purchase, 2002–13 (Index 2002 = 100)**



SOURCE: Panel of assessed taxpayers by the Israel Tax Authority.

According to Expenditure Survey data, the main difference between the characteristics of individuals who do not own a home and those who own at least one home (Table 5.1) is that the individuals who do not own a home are younger. According to data from the file of home buyers (Table 5.2), there is also variance in the characteristics of purchasers: First-time home buyers are younger than those upgrading or purchasing an investment home, and their real annual wage is lower. The number of work months per year for first-time home buyers and for those upgrading is higher than for those purchasing an investment home. The value of the homes purchased by investors is lower. (The homes were smaller and located in areas of lower socioeconomic standing.)

Beyond the differences in characteristics between these population groups, there are also differences within each group between its characteristics before and after

**Table 5.1**  
**Summary statistics—The characteristics of young couples who own a home compared with young couples who do not<sup>a</sup>, 2004–07 compared with 2008–14**

	Non-homeowners		Homeowners	
	2004-2007	2008-2013	2004-2007	2008-2013
Education		15.13	14.58	15.15
Age		31.45	33.12	33.71
Percentage of men		0.51	0.45	0.45
Number of children		1.25	2.24	2.48
Percentage married		0.69	0.95	0.94
Percentage of immigrants <sup>b</sup>		0.23	0.21	0.21
Employment rate		0.82	0.80	0.83
Real monthly wage		4,991	5,558	5,815
Average number of individuals each year		458,162	475,794	460,921

<sup>a</sup> The individuals in the sample include all young people in the Jewish sector, aged 25–39 who reported in the Expenditure Survey that they are heads of household or spouses of heads of household.

<sup>b</sup> An individual is defined as an immigrant if he immigrated to Israel after 1990.

SOURCE: Based on the Central Bureau of Statistics Expenditure Survey.

the home price increases. The average age of those upgrading their homes increased, while the age of other home purchasers remained virtually unchanged. The average age of individuals owning a home increased more than that of those who do not own a home. There are also differences in the number of children of these families. The characteristics of the homes purchased also changed, with the size of homes purchased as investments declining over the period, and those homes at the end of the period belonging to areas with lower socioeconomic standing than investment homes at the beginning of the period.

Homes purchased by the other groups were characterized by more rooms and a larger area, although these were also purchased in areas with lower socioeconomic standing over the period. Between the two periods, there was a marked decline in the percentage of young individuals who owned a home: a decline of 18 percent in the ownership rate among young people with a real monthly income below the median, and of 10 percent among those with an income above the median.

The labor patterns of the various population groups also differed markedly over the period, both in the supply of labor and in wages. Since the population groups differ from each other, and their composition also changed over time, as shown by a comparative statistical analysis of the two data files, the extent to which these differences in labor patterns are a result of changes in the characteristics of those individuals, and the extent to which they can be attributed to home price increases is unclear. First, the increase in home prices could have affected the groups in a different manner than the variance in their characteristics. Second, the very decision to purchase a home is endogenous, and the increase in home prices may therefore affect

**Table 5.2**  
**Summary statistics—Characteristics of young working-age employees who purchased a dwelling by type of purchase<sup>a</sup>, 2004–07 compared with 2008–14**

	First-time homebuyers		Upgrade purchasers		Investment home purchasers	
	2002-2007	2008-2013	2002-2007	2008-2013	2002-2007	2008-2013
Age	30.19	30.74	32.37	33.59	33.90	34.10
Percentage married	0.60	0.61	0.72	0.74	0.74	0.72
Number of children	0.79	0.87	1.65	1.94	2.06	2.41
Percentage men	0.59	0.58	0.55	0.55	0.56	0.55
Area of home	82.20	86.14	94.32	98.38	80.16	76.38
Socioeconomic character of the location <sup>b</sup>	11.14	10.69	11.33	10.81	11.30	9.95
Number of work months per year <sup>c</sup>	9.40	9.45	9.80	9.43	9.36	8.87
Real annual wage <sup>d</sup>	73,074	78,430	91,107	88,245	107,210	94,357
Average number of purchasers per year	1,335	2,180	1,135	1,297	312	517

<sup>a</sup> The individuals in the sample include all young people in the Jewish sector, aged 25–39 who reported in the Expenditure Survey that they are heads of household or spouses of heads of household.

<sup>b</sup> The socioeconomic character of the home's location is determined by the Central Bureau of Statistics socioeconomic rating for statistical areas on a scale of 0 to 20 (based on the 2008 Census).

<sup>c</sup> The average number of work months per year is a moving average of the 2 years before the purchase of the dwelling.

<sup>d</sup> The average annual real wage is a moving average of the 2 years before the purchase of the dwelling.

SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

individuals' decisions on whether to purchase a home and their labor supply. Third, a comparison of the two groups may also include other changes in the economy. In order to partially neutralize these effects, we used regressions that compare the labor patterns of the groups before and after the price increases, while controlling for the characteristics of the individuals and periodic characteristics. Using these regressions, we examined whether gaps in labor patterns developed between individuals with the observed characteristics excluding home ownership.

The comparison groups in the file based on Expenditure Survey data were defined as follows: The group of individuals who do not own a home (the treatment group), compared to the group of individuals who do own a home (the control group). The treatment period was defined as the period in which home prices increased sharply—2008–2014— compared to the period preceding 2008 (the control period).<sup>8</sup> The dependent variable is the likelihood of an individual working during the reviewed period (at least one month during the three months prior to the Survey being conducted). A comparison of the variance in the employment of the individuals between the two groups between the period preceding the price increases and that following it is reflected

<sup>8</sup> A slightly more narrow selection of the treatment and control periods (2004–2007 compared to 2010–2014) does not materially change the results of the estimation. In most cases, the obtained estimations are even larger and more statistically significant.

in the interaction coefficients between the treatment group in the treatment period (a diff-in-diff coefficient)<sup>9</sup>, while controlling for the individuals' characteristics<sup>10</sup> and the inclusion of dummy variables for a sample year.<sup>11</sup> The regressions were estimated in a number of ways—first on the entire population, then separately for men and women. Regressions were also estimated on all couples sharing a joint household, and the labor patterns of each of the spouses were examined through separate regressions.

The comparison groups were defined similarly in the second file. The group of first-time home buyers (the treatment group) compared with the other groups (upgrades and those purchasing an investment home), which were defined as two separate control groups. The comparison periods were defined similarly to the analysis above.<sup>12</sup> The dependent variables examined in the file are the annual number of work months and the real annual wage of home buyers.<sup>13</sup> A comparison of the variance in labor patterns between the two groups between the period before the price increases and those after it was also conducted here by estimating regressions that controlled for the characteristics of the individuals and of the dwellings purchased<sup>14</sup> and by including

<sup>9</sup> The analysis of the results is based on an examination of the change in employment rates of the treatment group relative to the control group before and after the increase in home prices. The period of increase in home prices that we defined as the treatment period affected both those who did not own a home and those who did. For those without a home who are interested in purchasing a home, the main effect was the price effect (the trade-off between purchase and rental) while for those who owned a home, the main effect was the income effect (the wealth effect). Therefore, the distinction between the treatment and control groups is in terms of the main effect—the price effect.

<sup>10</sup> The characteristics of the individuals included in the regressions are: gender, level of education, age, a dummy variable that obtains the value of 1 if the individual is married, a dummy variable for new immigrant, a dummy variable by continent of birth, a dummy variable for age of the head of household, and the number of children. Standard errors of the estimates appearing in the regression are clustered according to level of education, age, and year in the sample of the individual, and are reported in parentheses.

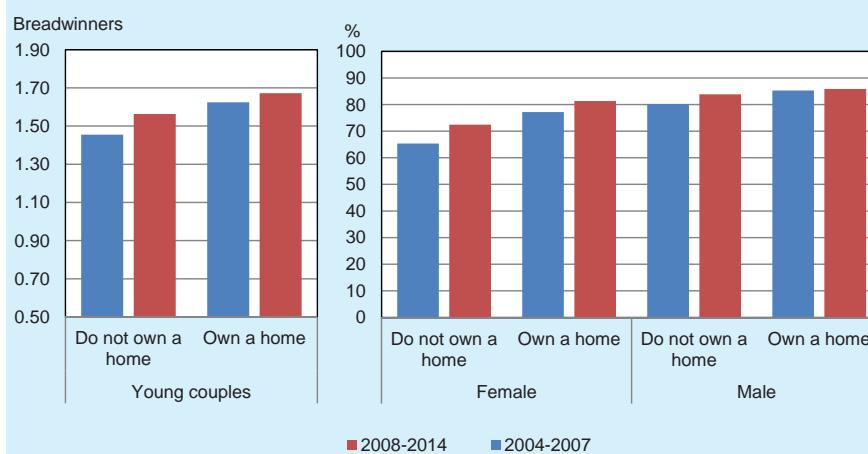
<sup>11</sup> In addition, there were simple regressions without these control variables. These regressions show that the gap in the employment rate between the population group that does not own a home and the group that does own a home increased more significantly after the increase in home prices than the gap estimated in the regressions that included control variables. Similar to the regression estimates with the control variables, most of the simple regression estimations were also found to be statistically significant.

<sup>12</sup> In this analysis as well, a narrower selection of the treatment and control periods (2002–2007 compared with 2010–2013) does not significantly change the results of the estimation.

<sup>13</sup> These dependent variables are moving averages of the number of work months per year and the real annual wage of home buyers in the two years before the purchase of the dwelling. This is in order to characterize individuals' permanent labor patterns. An examination of the number of work months per year and the real annual wage in the purchase year alone, and the moving averages of the three years prior to the purchase, show similar findings.

<sup>14</sup> The characteristics of the individuals and of the dwellings they purchased that are included in the regression are: age, gender, marital status, number of children, number of rooms in the dwelling, area of the dwelling, socioeconomic status of the location, and a dummy variable for geographic area. Standard errors of the estimates appearing in the regression are clustered by socioeconomic status of the location of the property and year of purchase, and are reported in parentheses.

**Figure 5.3**  
**The Number of Breadwinners and Employment Rates Among Young Couples by Home Ownership<sup>a</sup>, 2004–07 compared with 2008–14**



<sup>a</sup> Based on the regression estimates from Table 5.3.

SOURCE: Based on the Central Bureau of Statistics Expenditure Survey.

dummy variables for year in the sample.<sup>15</sup> The regressions were estimated on all salaried employees who purchased a home between 2002 and 2013, as well as on male and female population groups separately. Regressions were also estimated on all salaried couples who purchased homes during the period, and one each of the spouses through separate regressions.<sup>16</sup>

An analysis of the results of the regressions, based on data from the Expenditure Survey, shows that the employment rates of individuals who do not own a home increased over the period more than among those who own at least one home. This increase mainly reflects a relatively sharp increase in the employment rate among men. The employment rate among those who do not own a home increased by about 5 percentage points after the price increases, while the employment rate among the population group of home owners increased by only about 3 percentage points. While the variance between the groups in this case is not statistically significant, an examination of the number of breadwinners among young couples by home ownership shows statistically significant findings, as can be seen in Figure 5.3 (and Table 5.3). The average number of breadwinners among young couples who do not own a home increased more significantly after the increase in home prices than among young couples who do own a home (0.05; SE=0.02). This increase reflected a sharp and

<sup>15</sup> In addition, simple regressions were estimated without these control variables. These regressions show that the gap in the number of work months per year and in the real annual wage between first-time home buyers and those upgrading or purchasing a home as an investment increased in most cases more markedly and more statistically significant than the gap estimated in the regressions that included the control variables.

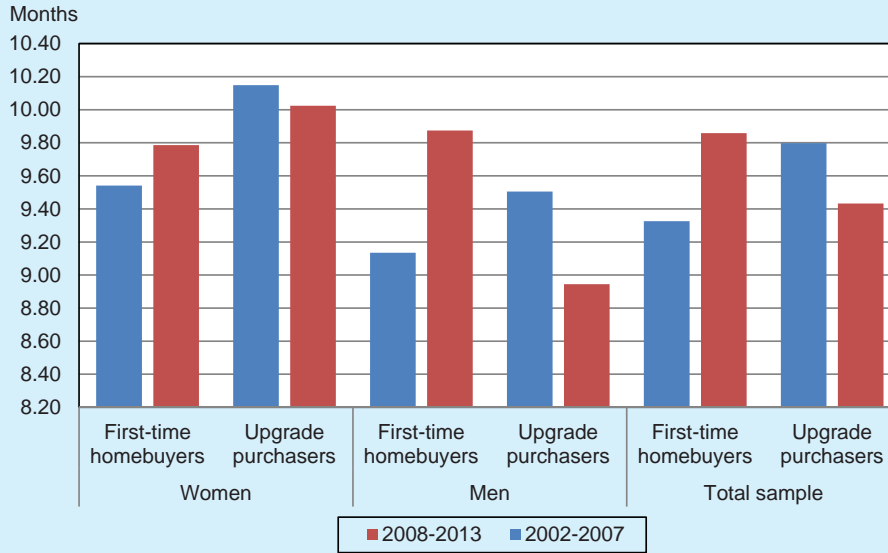
<sup>16</sup> An examination of the labor patterns among young couples reduces the sample size significantly, because it requires that both salaried employees and their spouses appear in the sample.

An econometric analysis based on the Expenditure Survey shows that the employment rates of individuals who do not own a home increased over the period more than among those who own a home.



statistically significant increase in the employment rates of men in households that do not own a home (0.03, SE=0.01), while the increase among their spouses did not show a clear variance between the two groups.

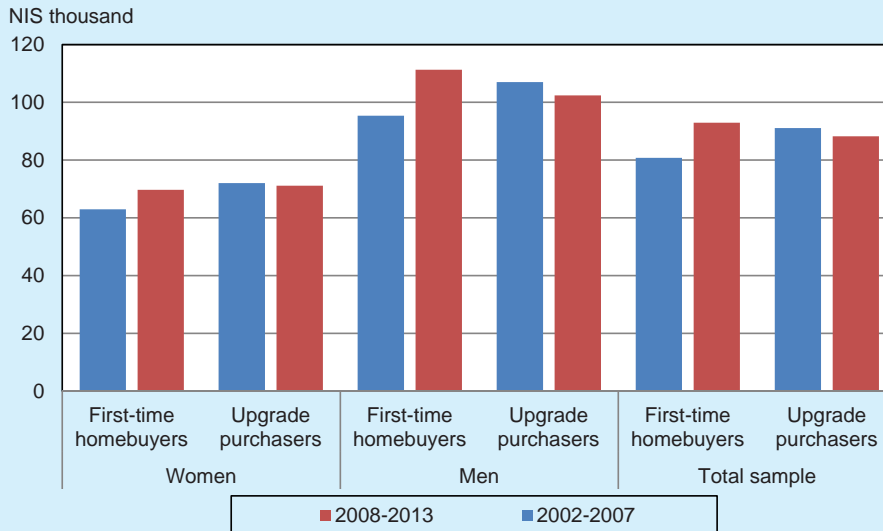
**Figure 5.4**  
**Number of Work Months Per Year By Type of Employment and Timing of Home Purchase<sup>a</sup>, 2002–07 Compared With 2008–13**



<sup>a</sup> Based on the regression estimates from Table 5.4.

SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

**Figure 5.5**  
**Annual Real Wage by Type of Home Transaction and Timing of Home Purchase<sup>a</sup>, 2002–07 Compared With 2008–13**



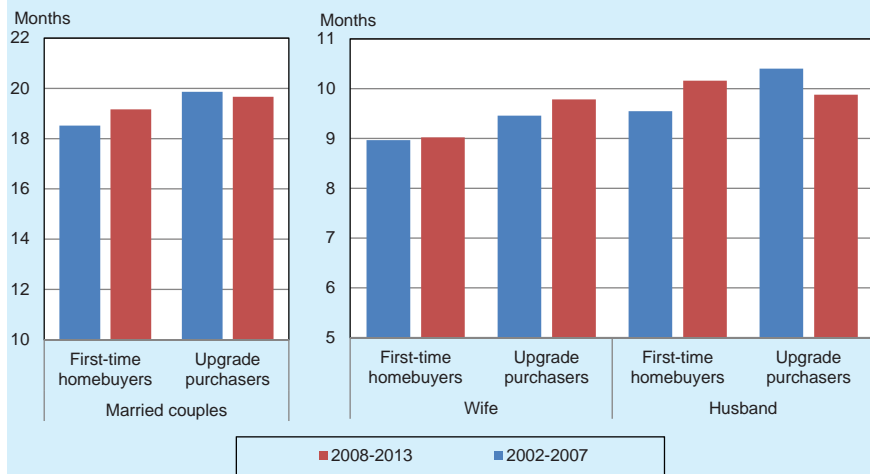
<sup>a</sup> Based on the regression estimates from Table 5.4.

SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

An econometric analysis of the findings from the home buyers file shows that both the number of work months per year and the annual average wage among those who purchased a first home after the price increases increased more than among those upgrading or purchasing a home as an investment.

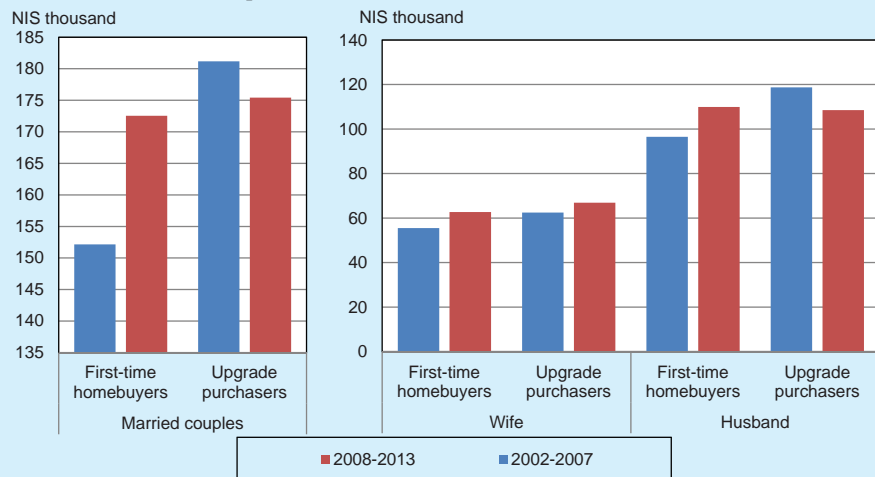
An analysis of the findings from the home buyers file shows that the number of work months per year and the annual average wage (which also reflects a change in the number of work hours per month, among other things) among those who purchased a first home after the price increases increased more than among those upgrading or purchasing a home as an investment. The increase is derived mainly from a sharp and statistically significant increase among men in households that purchased a first apartment. As shown in Figures 5.4 and 5.5 (and in Table 5.4), the number of work months per year and the real annual wage among first-time home buyers increased after the price increases, while among those upgrading, they declined slightly. These

**Figure 5.6**  
Number of Work Months Among Married Couples by Type of Transaction and Timing of Home Purchase<sup>a</sup>, 2002–07 Compared With 2008–13



<sup>a</sup> Based on the regression estimates from Table 5.4.  
SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

**Figure 5.7**  
The Real Annual Wage Among Married Couples by Type of Transaction and Timing of Home Purchase<sup>a</sup>, 2002–07 Compared With 2008–13



<sup>a</sup> Based on the regression estimates from Table 5.4.  
SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

differences are statistically significant: The gap in work months per year between the groups increased after the price increases by about 0.41 months (SE=0.09), and the real annual wage increased by more than NIS 10,000 (SE=1,500). Separate analyses for men and women show that these differences were mainly the result of changes in labor patterns among men, changes that were found to be statistically significant. The differences in labor patterns among women were smaller. The gap in the number of work months per year between men in households that purchased a first home and those upgrading their homes increased by about 0.56 months (SE=0.12), and was found to be statistically significant. Among women, the gap between these population groups increased by 0.29 months (SE=0.1), and was also found to be statistically significant. A similar finding was obtained regarding the real annual wage: the gap between men in households that purchased a first home and those upgrading increased by about NIS 13,200 (SE=2,100), accounting for about 15 percent of their annual wage, and among women it increased by NIS 6,300 (SE=1,500). These gaps were also found to be statistically significant. Similar findings were obtained from comparisons of the change in labor patterns among first-time home buyers after the price increases relative to the change among those purchasing an investment home.<sup>17</sup>

Focusing on salaried couples (Figures 5.6 and 5.7 and Table 5.5) indicates similar differences in labor patterns. In this case as well, the differences are derived from changes among men. Male first-time home buyers increased their total annual work months by about 0.88 months (SE=0.37) more than men upgrading their homes—a statistically significant difference. Among their spouses, there were no significant gaps. Similarly, the real annual wage of both spouses buying a first home increased over the period more than among couples upgrading their homes (by about NIS 23,000, SE=7,400, accounting for about 13 percent of the average wage in the group). A similar comparison to the population group purchasing investment homes shows that relative to this group as well, a gap developed in the number of work months.<sup>18</sup>

In summation, it can be determined that during the period of sharp price increases in the housing market in Israel, gaps in the supply of labor developed between various population groups according to their home ownership. Individuals that did not own a home before the price increases increased their employment rates more than individuals who did own a home. Similarly, the number of work months per year increased among first-time home buyers more than among those upgrading or purchasing an investment home, and the real annual wage increased even more than the increase in the number of work months per year. These changes mainly reflected

The findings support the hypothesis that households that planned to purchase a home, or that purchased a home after the price increases, increased their labor supply in order to finance the purchase.

<sup>17</sup> The differences between the groups in the increase in the number of work months per year and in the real annual wage after the price increases are also statistically significant. The increase in the number of work months per year among first-time home buyers was about 0.38 months higher (SE=0.14), and statistically significant, than among those purchasing an investment home, and the increase in the real annual wage was about NIS 8,000 higher (SE=3,600).

<sup>18</sup> The increase in total annual work months of married couples after the price increase was statistically significant—about 1.84 months (SE=0.96) among first-time home buyers relative to those purchasing an investment home. The real annual wage also increased more in this group, but here the coefficient was not statistically significant.

the increase in the labor supply among men, while the employment rates, number of work months per year, and real wages of women remained virtually unchanged. These findings support the hypothesis that households that planned to purchase a home, or that purchased a home after the price increases, increased their labor supply in order to finance the purchase, while the labor supply of households that already owned a home before the price increases remained relatively stable over the period.

**Table 5.3**  
**The number of breadwinners and the employment rates in households of young couples who are not homeowners compared with households that are homeowners<sup>a</sup>, 2004–07 compared with 2008–14**

		First period 2004-2007	Second period 2008- 2014	Diff-in- diff <sup>c</sup>	Number of observations
Number of breadwinners	Control group <sup>b</sup>	1.62	1.67	0.05**	3,548,070
	Treatment group <sup>d</sup>	-0.17***	-0.11***		
Employment rates among men	Control group <sup>c</sup>	0.85	0.86	0.03*	3,548,070
	Treatment group <sup>d</sup>	-0.05**	-0.02*		
Employment rates among women	Control group <sup>c</sup>	0.77	0.81	0.02	3,548,070
	Treatment group <sup>d</sup>	-0.12***	-0.09***		

<sup>a</sup> The observations in the sample include all households in the Jewish sector aged 25–39.

<sup>b</sup> The control group includes the averages of the number of breadwinners among home owning households.

<sup>c</sup> The control group includes the averages of the employment rates among home owners.

<sup>d</sup> The treatment group includes the estimates of the dummy variables that obtain the value of 1 if the individual is included in the treatment group (the individual is not a homeowner) from separate regressions for each of the two periods. The dependent variable in these regressions obtains the value of 1 if the individual worked during the reviewed period (for at least one month in the period before the survey was conducted). The other supervision variables are: the characteristics of the individuals (gender, level of education, a dummy variable that obtains the value of 1 if the individual is married, a dummy variable for a new immigrant, dummy variables for four groups of continent of birth, dummy variables for religion of the head of household, age, and number of children), and a dummy variable for the year. Standard errors are clustered by level of education and age of the individuals and the year in the sample.

<sup>e</sup> The diff-in-diff estimations are the interaction variables between the treatment group and the treatment period. The dependent variable in these regressions obtains the value of 1 if the individual worked during the reviewed period (for at least one month in the period before the survey was conducted). The explanatory variables are: a dummy variable that obtains the value of 1 if the observation was included in the treatment group (the individual is not a homeowner) and the value of 0 if the observation was included in the control group, dummy variables that obtain the value of 1 if the observation was included in the treatment period (the second period, from 2008 to 2014), and the value of 0 if it was not included in the treatment group (the first period, from 2004 to 2007), and an interaction variable between these two variables. The other supervision variables include the characteristics of the individuals (gender, level of education, a dummy variable that obtains the value of 1 if the individual is married, a dummy variable for a new immigrant, dummy variables for four groups of continent of birth, dummy variables for religion of the head of household, age, and number of children), and a dummy variable for the year. Standard errors are clustered by level of education and age of the individuals and the year in the sample.

\* Statistically significant to a level of 10 percent.

\*\* Statistically significant to a level of 5 percent.

\*\*\* Statistically significant to a level of 1 percent.

SOURCE: Based on the Central Bureau of Statistics Expenditure Survey.

**Table 5.4**  
**Comparison of the labor patterns of young first-time homebuyers relative to the labor patterns of young upgrade purchasers<sup>a</sup>, 2002–07 compared to 2008–13**

		Work months per year			Real annual wage			Number of observations
		2002-2007	2008-2013	Diff-in-Diff	2002-2007	2008-2013	Diff-in-Diff <sup>d</sup>	
Total sample	Upgrade purchasers <sup>b</sup>	9.80	9.43	0.41***	91,107	88,245	9,999***	25,346
	First-time homebuyers <sup>c</sup>	-0.47***	0.43***		-10,323***	4,681***		
Men	Upgrade purchasers <sup>b</sup>	9.51	8.94	0.56***	107,005	102,388	13,273***	14,649
	First-time homebuyers <sup>c</sup>	-0.37***	0.93***		-11,654***	8,879***		
Women	Upgrade purchasers <sup>b</sup>	10.15	10.02	0.29***	72,026	71,116	6,304***	10,697
	First-time homebuyers <sup>c</sup>	-0.61***	-0.24***		-9,074***	-1,426		

<sup>a</sup> The observations in the sample include only salaried employees in the Jewish sector aged 25–39 who are first-time homebuyers or upgrade purchasers.

<sup>b</sup> The control group includes the averages of the number of work months per year and the real annual wage among individuals who own homes.

<sup>c</sup> The treatment group includes the estimates of the dummy variables that obtain the value of 1 if the individual is included in the treatment group (first-time-homebuyer) from separate regressions for each of the two periods. The dependent variable in these regressions is the number of work months per year or the real annual wage. The other supervision variables are: the characteristics of the individuals (gender, marital status, age, and number of children), the characteristics of the purchased home (number of rooms, area of the dwelling, socioeconomic standing of the location of the property), a dummy variable for the year, and a dummy variable for the residential area. Standard errors are clustered by the socioeconomic standing of the property's location and the year in the sample.

<sup>d</sup> The diff-in-diff estimations are the interaction variables between the treatment group and the treatment period. The dependent variable in these regressions is the number of work months per year or the real annual wage. The explanatory variables are: a dummy variable that obtains the value of 1 if the observation was included in the treatment group (first-time homebuyer) and the value of 0 if the observation was included in the control group, a dummy variable that obtains the value of 1 if the observation was included in the treatment period (the second period, from 2008 to 2013), and the value of 0 if it was not included in the treatment period (the first period, from 2002 to 2007), and an interaction variable between these two variables. The other supervision variables include the characteristics of the individuals (gender, marital status, age, and number of children), characteristics of the purchased dwelling (number of rooms, area of the dwelling, the socioeconomic standing of the property's location), a dummy variable for the year, and a dummy variable for the residential area. Standard errors are clustered by the socioeconomic standing of the property's location and the year in the sample.

\* Statistically significant to a level of 10 percent.

\*\* Statistically significant to a level of 5 percent.

\*\*\* Statistically significant to a level of 1 percent.

SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.

**Table 5.5**  
**Comparison of the labor patterns of young first-time homebuyers relative to the labor patterns of young upgrade purchasers<sup>a</sup>, 2002–07 compared to 2008–13**

		Work months per year			Real annual wage			Number of observations
		2002-2007	2008-2013	Diff-in-diff	2002-2007	2008-2013	Diff-in-diff <sup>d</sup>	
Total sample	Upgrade purchasers <sup>b</sup>	19.86	19.67	0.45	181,183	175,431	23,817***	1,305
	First-time homebuyers <sup>c</sup>	-1.34***	-0.50		-29,033***	-2,882		
Men	Upgrade purchasers <sup>b</sup>	10.40***	9.88**	0.88***	118,699	108,499	23,307***	1,305
	First-time homebuyers <sup>c</sup>	-0.86***	0.28		-22,167***	1,414		
Women	Upgrade purchasers <sup>b</sup>	9.46***	9.79***	-0.45	62,484	66,932	288	1,305
	First-time homebuyers <sup>c</sup>	-0.49	-0.76***		-6,990	-4,198		

<sup>a</sup> The observations in the sample include only the spouses of salaried employees in the Jewish sector aged 25–39 who are first-time homebuyers or upgrade purchasers.

<sup>b</sup> The control group includes the averages of the number of work months per year and the real annual wage among individuals who own homes.

<sup>c</sup> The treatment group includes the estimates of the dummy variables that obtain the value of 1 if the individual is included in the treatment group (first-time-homebuyer) from separate regressions for each of the two periods. The dependent variable in these regressions is the number of work months per year or the real annual wage. The other supervision variables are: the characteristics of the individuals (gender, marital status, age, and number of children), the characteristics of the purchased home (number of rooms, area of the dwelling, socioeconomic standing of the location of the property), a dummy variable for the year, and a dummy variable for the residential area. Standard errors are clustered by the socioeconomic standing of the property's location and the year in the sample.

<sup>d</sup> The diff-in-diff estimations are the interaction variables between the treatment group and the treatment period. The dependent variable in these regressions is the number of work months per year or the real annual wage. The explanatory variables are: a dummy variable that obtains the value of 1 if the observation was included in the treatment group (first-time homebuyer) and the value of 0 if the observation was included in the control group, a dummy variable that obtains the value of 1 if the observation was included in the treatment period (the second period, from 2008 to 2013), and the value of 0 if it was not included in the treatment period (the first period, from 2002 to 2007), and an interaction variable between these two variables. The other supervision variables include the characteristics of the individuals (gender, marital status, age, and number of children), characteristics of the purchased dwelling (number of rooms, area of the dwelling, the socioeconomic standing of the property's location), a dummy variable for the year, and a dummy variable for the residential area. Standard errors are clustered by the socioeconomic standing of the property's location and the year in the sample.

\* Statistically significant to a level of 10 percent.

\*\* Statistically significant to a level of 5 percent.

\*\*\* Statistically significant to a level of 1 percent.

SOURCE: Based on the panel of assessed taxpayers by the Israeli Tax Authority and the CARMAN real estate cardfile.