Chapter 8
The Housing Market

- The number of transactions in the housing market began to increase again this year, led by first-time home buyers. Home prices rose during the year at an annual rate of 3 percent, after a period of stability in 2017–2018.
- The number of building completions in 2019 remained high, similar to 2018.
- The number of housing starts remained stable at around 52,000 units per year. After a great deal of land was marketed for residential construction between 2015 and 2018, the number of housing units actually marketed fell considerably this year.
- The number of dwellings purchased through the Buyer's Price program increased, and as of the end of 2019 approximately 40,000 Buyer's Price winners are expected to purchase an apartment in 2020 and 2021, since the lotteries are held close to the time of marketing the land, which is about 18 months to two years before the issue of the building permits and registration of the transactions. Demand in the periphery seems to have been met in full.
- In the last decade, the number of homes purchased by housing upgraders declined relative to the number of first-time home buyers. This is the result of lower demand, mainly by investors, for the apartments that the housing upgraders wish to sell. Most of the decline in the number of purchase transactions was in the move by housing upgraders to a more expensive home than their previous one, whereas the number of transactions by those moving to a similar or lower-priced home than their previous one remained stable.
- The spatial distribution of housing starts in recent years corresponds with that of households, and reflects the distribution of construction approvals issued by the planning committees at the beginning of the decade. The number of approvals issued by the planning committees in all regions has grown steadily since the beginning of the decade, but the share of approvals in the periphery has increased more rapidly.
- A model comparing the investment return on housing in the form of rent relative to the alternative of long-term investment in the capital market indicates pressure to lower the cost of housing. Nonetheless, it is extremely difficult to predict how prices will develop, given that housing prices are influenced by additional factors that were not tested in the model.

1. MAIN DEVELOPMENTS

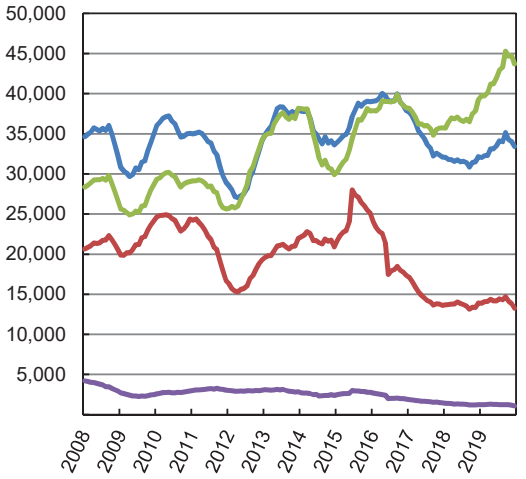
In 2019, home prices increased by 3 percent, after remaining stable in 2017 and 2018. The number of transactions increased, led by first home buyers.

In 2019, the number of transactions in the housing market continued to increase, a trend that began in the last quarter of 2018 after a two-year decline. The increase is particularly noticeable among first-time home buyers who accounted for the purchase of 44,000 dwellings, the highest number in the last decade. First-time home buyers accounted for 47 percent of all transactions, compared with 42 percent in 2016 when the first lotteries in the Buyer's Price program were held. The number of transactions by housing upgraders also increased this year, after having declined steadily for two-and-a-half years, although the share of upgraders as a percentage of all transactions continued to decline. The number of transactions by investors remained stable but their share of all transactions continued to fall.

Among the factors that contributed to the higher demand this year (see Table 8.1) were a population increase of 56,000[1] in the 25–64 age group; the tight labor market, which is reflected in a further increase in real wages, a continuing increase in real household income, and the low rate of unemployment[2]; lower mortgage interest rates, which reduced monthly repayments; and the Buyer's Price program, which increased demand for new apartments. Although the subsidy granted by the government to those eligible in this program caused demand to increase from 2016, when the lotteries began, the resulting increase in the number of transactions is only felt when the projects reach the implementation stage (i.e. when the contract is signed), which is generally eighteen months to two years after the lottery.

On the supply side, it is clear that long-term processes initiated by the government over the last ten years have produced results in the last few years, having led to a large number of building completions. In 2019, the number of building completions remained stable at a high level of

Figure 8.1
Annual Number of Transactions by Type of Purchaser, 2008–19



[a] Housing upgraders in waiting are households that have purchased a new home before selling their previous one.
SOURCE: Based on Israel Tax Authority, CARMAN file.

[1] The indicator for housing needs is the number of households, but this figure is difficult to measure and use—in part as it is endogenous and influenced by the inventory of homes. In contrast, population data are exogenous to the housing market.

[2] For additional information see Chapter 1.

Table 8.1
Selected housing market data, 2010–2019

(2019 data relate to the last 12 months for which there are data)

	1997–2009 average	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Demand factors											
Population aged 25–44 (change, thousands)	72.2	66.4	60.3	39.8	49.3	67.8	51.3	57.7	57.2	54.8	56.4
Average real wage per employee post	1	0.7	0.4	0.6	1.1	1.3	2.9	2.8	2.8	2.7	2
Average net real household income	2.7[e]	2.4	-0.2	3.5	4.1	3.1	2.5	2.7	4.6	4.1	3
Unemployment rate among those aged 25–64 (level, percent)	9.2	7.3	6.3	5.9	5.4	5	4.5	4.1	3.7	3.5	3.4
Weighted real interest rate on new mortgages[a] (level, percent)	3.5[e]	1.4	2.5	2.2	1.6	1.3	1	1.5	1.9	1.7	1.5
Real per capita GDP (rate of change)	1.5	3.7	3	0.5	2.3	1.8	0.3	2	1.6	1.4	1.3
Rate of those planning to buy a home in the next 12 months[b] (percent)			6.6	7.7	7.4	7.3	7	7.6	7.3	8.4	8.3
Supply variables											
Building starts[c] (thousands of units)	36.6	40.4	46.6	43.5	47.9	47.7	53.7	56.4	53.9	52	50.8
of which: Building starts as part of urban renewal						6.0	7.6	8.2	9.3	10.3	10.8
of which: Net additional housing units in urban renewal (estimate)						4.8	6	6.3	7.4	8.7	8.6
Building completions[c] (thousands of units)	40.2	33.3	34.1	37.4	42.5	44.7	43.9	46.1	48.5	50.7	50.6
Stock of homes under active construction (end of year, thousands of units)	69.3	70.9	83.2	89	94.2	96.9	106.3	116.3	120.9	121.6	123
Building permits[c] (thousands of units)	28.3	43.4	50.3	45.5	50.1	47.7	55.3	53.9	55.6	52.6	54.1
Investment in residential construction (rate of change)	-0.9	12.3	9.9	6.8	5.5	6.7	0.6	8.5	4	-2.4	1.9
Outcome variables											
Housing transactions[d] (thousands)	91.5	104	86.5	102.7	114.4	99.6	121.1	112	101.5	102.6	110
New homes sold (thousands)	17.2[e]	22.5	19.5	22.5	24.3	23.6	32.1	29.8	24.5	22.9	32.5
Homes not for sale, under construction (thousands)	14.7[e]	17.6	20.3	20.2	19.5	18.3	18.9	19.8	18.5	17.9	17.8
Home prices (real rate of change)	-1.1	11.1	1.8	6.9	5.4	4.5	9	5.9	1	-1.2	2.9
Households that do not own a home (percentage of population)	28.6[f]	28.8	27.6	28	27.9	27.9	27.5	27.4	28.2	27.5	
Households that own more than one home (percentage of population)	3.2[f]	4.5	6.4	7.9	8.4	9.1	9.9	9.7	10	10.1	
Length of time to sell home (days)			121	205	168	204	190	194	173	221	217
Percentage of homes purchased for investment (as a share of total purchases)		27.7	23.8	22.2	22.6	25	24.9	18.7	16.9	16.5	15.6

[a] The real weighted interest rate on mortgages is calculated assuming a 2 percent annual inflation rate.

[b] The rate of those planning to purchase a home is taken from the Central Bureau of Statistics Consumer Confidence Index.

[c] The data relate to the last four quarters.

[d] The number of residential home transactions is based on purchase tax and betterment tax data.

[e] Average from 2004 to 2009.

[f] Average from 2003 to 2009.

SOURCE: Central Bureau of Statistics, Ministry of Construction and Housing, Israel Tax Authority, and Bank of Israel.

50,600. The inventory of homes under construction remained at the high level reached in 2017—about 120,000.

Since the home construction process lasts a long time, the supply of housing is inelastic in the short term. The process of producing apartments can be divided into two key stages: creation of the planning inventory (from the feasibility study to approval of the plan by the district planning committee), and land marketing and construction. Planning Administration data show that the length of time required to create the planning inventory has been reduced somewhat, and that the pace of approving the plans in the district planning committees has increased significantly.[3] Land marketed by the Israel Land Authority declined in 2019 from the high levels of the previous three years.

The various indicators of the volume of residential construction show a high level of activity. The number of building starts, which has been high for several years, remained stable in 2019. The number of building permits issued rose by 4 percent in this period, and this process is reflected in a moderate 1.9 percent increase in investment in residential construction.

The most recent Dwellings Price Index figure (November–December 2019) shows an increase at an annual rate of 3.0 percent.

2. GOVERNMENT ACTIONS TO INCREASE SUPPLY

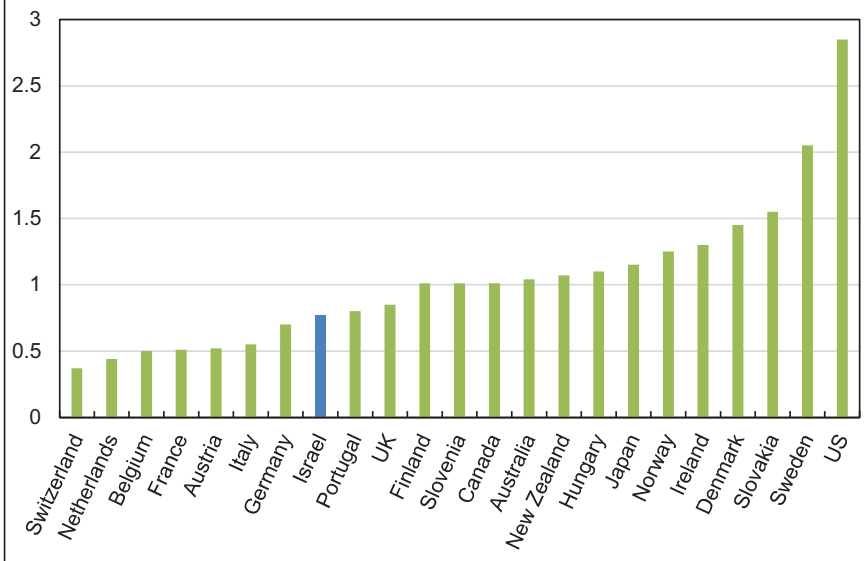
Since the production of new homes is a long process, the supply of housing in the short term is rigid. An OECD analysis shows that the supply of housing in Israel is more inelastic than in other countries (Figure 8.2) and this impedes the ability of supply to respond immediately to exogenous shocks in demand. As a result, the adjustment to changes in demand in the short term is primarily expressed in price changes so that increased demand for housing is likely to cause prices to rise, as occurred between 2008 and 2017. In contrast, if the supply of housing reacts too quickly to price increases, the result could be a rapid drop in home prices which, in certain situations, is also undesirable.

In recent years, the government has made considerable effort to improve the bureaucratic processes in an effort to shorten the time necessary to produce apartments, while at the same time increasing the planning inventory so as to shorten the economic cycles in the housing market, allowing them to correlate with the ordinary economic cycles.

The policy measures adopted by the government in an effort to increase the supply of housing were: (1) The establishment of the National Housing Bureau, which is charged with coordinating the activity of the relevant government and nongovernment bodies to enable housing plans to be advanced quickly; (2) Setting defined planning

[3] The final impact of the increased supply depends on the extent to which the planning processes have progressed to the more advanced stages, but no data are available for this.

Figure 8.2
Estimates of the Long-Run Price Elasticity of New Housing Supply, 2019



[a] The index is based on data on investment in residential construction .
SOURCE: OECD, "Economic Survey of Israel", 2020 (forthcoming).

goals for residential construction until 2040; (3) Increasing the planning inventory[4], in part by establishing a designated body—the National Planning & Building Committee for Priority Housing Areas (known by its Hebrew acronym VATMAL)—in order to shorten the planning processes; (4) Promoting urban renewal; (5) Umbrella agreements aimed at counteracting the negative incentive of the local authorities to increase the population in their area; (6) Advancing the Planning Administration's initiative to significantly increase population density in the cities.

The statutory stages of the housing production process before construction can begin are approval of the plans at the national and regional levels, marketing of the land by the Israel Land Authority about a year after the plans are approved by the committees, and the issuing of building permits by the local planning committees about two-to-three years after the marketing of the land.[5] We will examine the changes that have occurred in the key stages of housing production from the perspective of both the time frames involved and the volume of activity.

[4] The State Comptroller's Report published in 2015 pointed to a shortage in the planning inventory, particularly in areas of high demand, as one of the causes of the rapid increase in the price of housing.

[5] In addition to the statutory stages, there are additional stages such the preparation and review of the plans by the Israel Land Authority or the Ministry of Construction and Housing, and preparations for the marketing of the land by the Israel Land Authority. Only estimates are available as to the duration of these stages.

a. The statutory stages in the process of producing apartments

(1) Submitting the plan to the Regional Planning Committee (or the VATMAL) and its approval

Between 2011 and 2018, the average times for the approval of plans by the district planning committees[6] were reduced by six months. This downward trend encompassed all districts except for the Center, where the average time increased.[7] The number of housing units approved each year increased significantly in two phases: From 2012, the number of units approved by the district planning committees more than doubled compared with the period before 2012, and in 2015, when the VATMAL began to approve priority housing areas, their number increased even more. The VATMAL's activity was accompanied by a moderate increase in the number of housing units approved by the district planning committees between 2015 and 2018 (Table 8.2).

Table 8.2
District committee and VATMAL approvals, 2011–2019

(thousands of units)

	2011	2012	2013	2014	2015	2016	2017	2018	2019
District committees	29.1	74.7	79.3	62.2	74.2	73.3	85.4	86.3	75.1
VATMAL	-	-	-	-	25.3	37.6	41.8	59.3	65.5
Total	29.1	74.7	79.3	62.2	99.5	110.9	127.2	145.6	140.6

SOURCE: Based on Planning Authority data.

(2) Land marketed by the Israel Land Authority

Following the high level of land marketing in 2017 and 2018, land marketing by the Israel Land Authority moderated.

The next stage in the production chain is marketing of the land by the Israel Land Authority.[8] Figure 8.3 shows the number of housing units in published tenders, and data for the transactions approved by means of a tender. The graph shows that further to the significant increase in the number of plans approved by the district planning committees from 2012 onwards, the number of housing units marketed by the Israel Land Authority in tenders with winners increased in 2013–2014.[9] Starting in 2016, in parallel with the increase in the number of approved plans and the VATMAL's

[6] Beginning in 2016, the average times are calculated for all the permits, including those issued by the VATMAL. The figure excluding the VATMAL is based on the assessment that the average times for the committees did not increase following the establishment of the VATMAL and remained at 2014–15 levels.

[7] According to figures published by the Planning Administration, the approval period for large-scale projects is longer. An increase in the average approval period for the plans may also be attributable to a change in the mix of the plans discussed by the district committee.

[8] This stage is only relevant for state-owned lands.

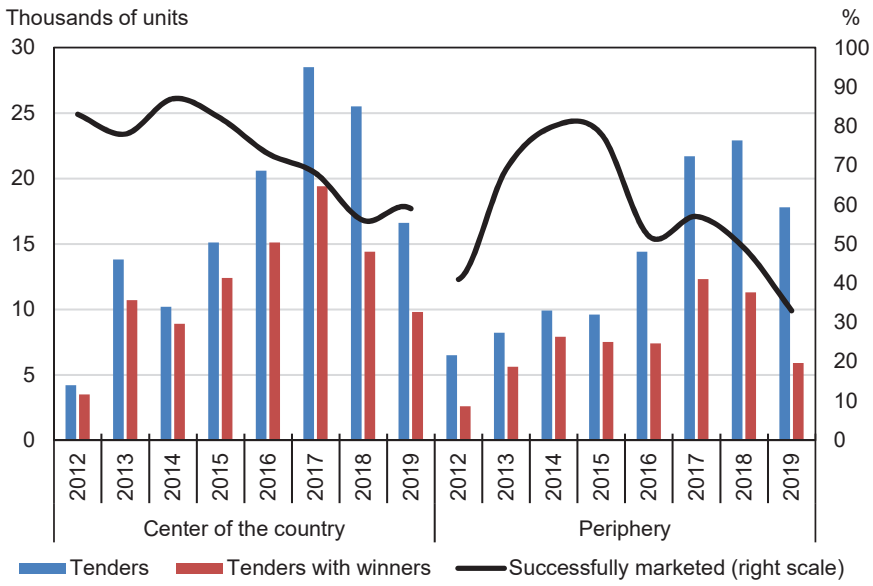
[9] According to estimates, the land is marketed about a year after the plan is approved by the district planning committee.

activity, the number of Israel Land Authority tenders with winners dropped both in the center of the country and in the periphery.

These developments were affected by the Buyer's Price program, which accounts for most of the marketing of the new building starts. In 2019, the number of housing units that were successfully marketed declined considerably, both due to a drop in the number of units offered in the tenders and due to a high percentage of tenders that were left without a winner.

Although some of the building starts are in projects under construction on private land, and the building starts in urban renewal projects do not require land[10], land marketed by the Israel Land Authority remains a dominant component of the supply of housing. According to estimates, approximately 20 percent of all housing starts in 2015–16 were not in projects marketed by the Israel Land Authority or part of urban renewal, but were apparently construction on private land. In contrast, in 2018–19, less than 5 percent of the building starts were not in urban renewal projects or projects marketed by the Israel Land Authority.[11] These findings seem to indicate

Figure 8.3
Marketing of Land (High-Density Construction): Published Tenders and Tenders with Winners, 2012–19



SOURCE: Based on Israel Land Authority data.

[10] Excluding supplementary land allocations in a small number of urban renewal projects.

[11] There is a gap of two to three years, on average, between marketing of the land and the start of construction. In calculating the estimate, we compared the number of building starts in a particular year, excluding urban renewal, with the number of Israel Land Authority transactions (by tender and by allocation without a tender) two to three years before the construction work commenced.

some substitution between construction on private land and construction on state lands. It is therefore possible that overload on the planning entities at different stages of advancing plans on state lands could result in a delay in the approval of plans to build on privately owned lands.

(3) Approval by the local planning committees and the issue of building permits

After the land is marketed, building permits must be issued. Data obtained from the available licensing system and from reports of the local planning committees indicate that the time required to issue a permit has been reduced, and according to the World Bank's "Doing Business" index, the process of obtaining building permits in Israel has improved in recent years. Nonetheless, applications for relief are sometimes submitted under the "Sheves–Kahlon" regulations beyond what was originally approved, and this causes delays in the licensing process.[12]

Construction: The final stage in the chain of producing a dwelling is the construction. There is an upward trend in the duration of this stage, to 2.5 years at the end of 2018, an increase of 5 months relative to the average for 2011–2013. One of the reasons for this is apparently a change in the mix of the construction. The percentage of buildings with more than 11 stories[13] has increased substantially in recent years[14], and the construction of hi-rise buildings takes longer than that of low-rise buildings. The Companies Survey and job vacancy data show that the construction industry's demand for professional workers has not changed, and the shortage of workers did not become more acute in the reviewed year.

The housing market is apparently influenced not only by the size of the supply of apartments but also by the extent to which the distribution of households corresponds with distribution of the supply of apartments. The spatial distribution of the supply of housing should, if possible, reflect the distribution of demand by households for housing services. In the absence of "pure" data about the demand for housing, we will use the distribution of households among the districts as an estimate of the distribution of demand, even though the distribution of households appears to suffer from a downward demand bias in the Center of the country and an upward demand bias in the periphery.[15] The distribution of building starts is strongly influenced by the distribution of land marketed by the Israel Land Authority, and this in turn is influenced by the spatial distribution of the approved plans.

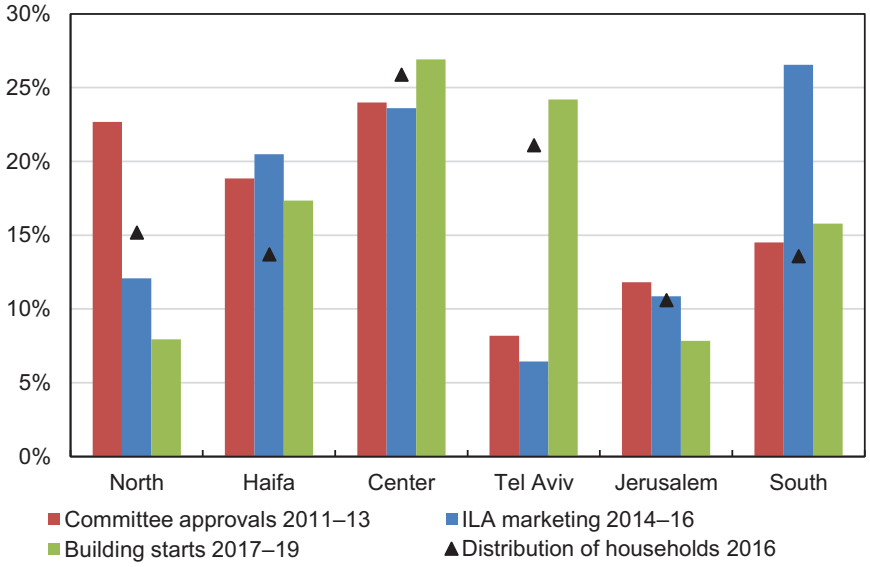
[12] Beyond the licensing delays, a draft report of the interministerial committee established by the government to review annulment of the leniencies in the planning and building sector shows that the increasing use of leniencies in the past few years has considerable negative repercussions, such as infrastructure that is inconsistent with the number of apartments after the leniency.

[13] A hi-rise building is defined according to the difference in height between the height of the entry level and the height of the highest floor. In most cases these are buildings with more than 10 stories.

[14] In 2018, the percentage of apartments in buildings with 11 stories or more doubled compared with 2006–07 and accounted for 25 percent of all the apartments.

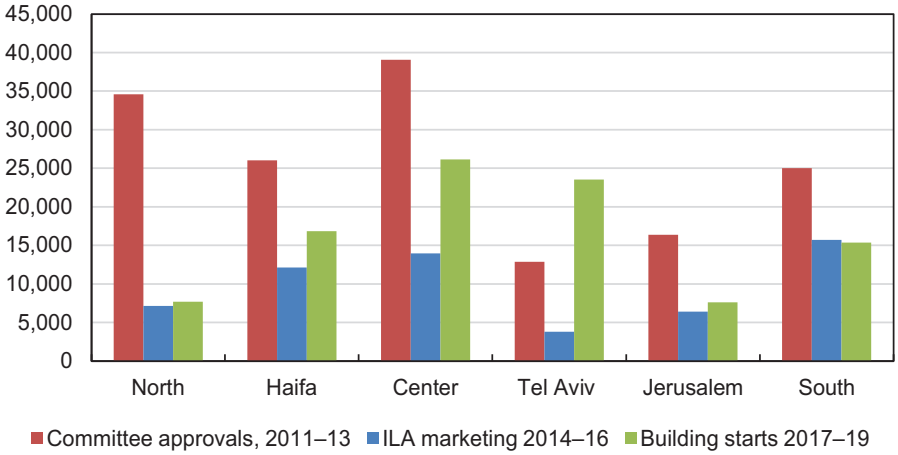
[15] In addition to demand, prices also affect the decisions of individuals, and housing prices as well as rents in areas of high demand are much higher than in the periphery.

Figure 8.4
Distribution of Committee Approvals, ILA Marketing, and Building Starts by District, High-Density Residential Construction, 2019



SOURCE: Based on Planning Administration, Israel Land Authority, and Central Bureau of Statistics.

Figure 8.5
Distribution of Commitee Approvals, ILA Marketing, and Building Starts by District, High-Density Residential Construction, 2019
(housing units)

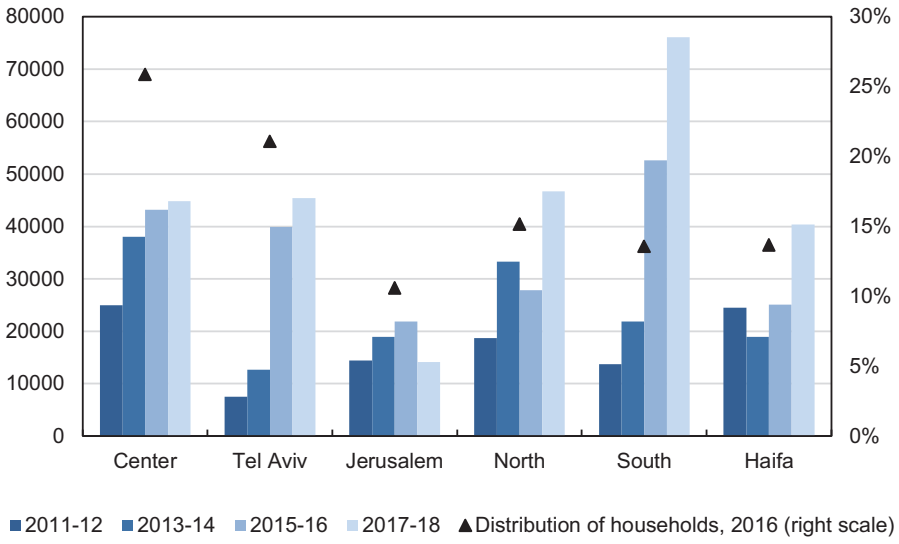


SOURCE: Based on Planning Administration, Israel Land Authority, and Central Bureau of Statistics.

The volume of district committee approvals reached a very high level, but the share of approvals in high-demand areas declined. This may have a negative impact on the congruence between the spatial distribution of building starts and the dispersal of households.

The approvals granted by the district planning committees determine the spatial distribution of the planning inventory.[16] Land marketed by the Israel Land Authority in the next stage is based on the distribution of the planning inventory[17], and subsequently, when the permits are issued, the building starts are to a large extent based on the lands marketed by the Israel Land Authority. An increase in the number of approvals issued by the planning committee in a particular district may therefore cause more land to be marketed a year or two later (if there is demand), and the relative increase of land marketed in the district will probably, two or three years later, increase the percentage of building starts originating in that marketing. Supply data in the spatial distribution, according to the key stages and time required to produce the dwelling, appear in Figures 8.4 and 8.5, in percent and in thousands of housing units, respectively. The figures show that in most districts, the distribution of planning committee approvals correlates with marketing of the land by the Israel Land Authority about two years later and with building starts about 5 years later. In the North, planning inventory exceeds demand, and its percentage of the land marketed by the Israel Land Authority and of building starts is significantly lower than its proportion of planning committee approvals. The correlation between the distribution of households and the distribution of planning committee approvals in 2011–13 would

Figure 8.6
Distribution of District Committee Building Approvals by District
(housing units)



SOURCE: Based on Planning Administration.

[16] For 2019, only aggregate approval data were obtained.
[17] If demand in a particular district is lower than the planning inventory, then some of the land will not be marketed successfully, and if demand is greater than the planning inventory, then surplus demand will be created in the short term.

appear to have facilitated the correlation between the distribution of households and that of building starts in the 2017–19 period.[18] The number of planning committee approvals in all regions has increased consistently since the beginning of the decade, but the share of the peripheral areas, particularly the South, increased at a higher rate (Figure 8.6). A decrease in the share of high-demand areas in the planning committee approvals could harm the extent to which the spatial distribution of building starts corresponds with the distribution of households.

b. Plans to increase the supply of housing

(1) Urban renewal

Many recently published studies point to the importance and advantages of building in areas with high wages and productivity.[19] The accessibility of high-productivity employment centers contributes to greater productivity and saving on travel time as a result of reduced commuting. Hsieh and Moretti (2019)[20] show that in the USA, limiting the supply of new housing by restricting construction in high productivity areas led to a significant loss of output. Chetty, Hendren, and Katz[21] found that children's achievements were positively impacted by moving to high-income areas. Shoag[22] presents a comprehensive survey of the literature regarding the negative ramifications of restricting the supply of housing in high-productivity areas, including a loss of potential output and harm to the equality of opportunities. In Israel, due to a shortage of available land in high-demand areas, and particularly in the Gush Dan metropolitan area, almost the only possibility of increasing the supply of housing in these areas is through urban renewal. Despite the high costs of urban densification, the prevailing view in the literature is that its benefits outweigh those costs.[23] Among the significant advantages of densification by means of urban renewal in high-demand areas are the preservation of open spaces, higher salaries and productivity due to the effect of agglomeration, and less commuting, which may somewhat reduce congestion on the roads.

[18] In the Center and Tel Aviv districts, some of the building starts come from urban renewal projects (about half of the difference between land marketed by the Israel Land Authority and building starts in 2017–2019) and privately owned land.

[19] For example: according to National Insurance Institute data, the average monthly salary in Tel Aviv is 25 percent higher than the national average.

[20] Chang-Tai Hsieh and E. Moretti, (2019). "Housing Constraints and Spatial Misallocation", *Economic Journal: Macroeconomics*, 11(2), 1–39, April, American Economic Association.

[21] R. Chetty, N. Hendren, and L. F. Katz (2016). "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment" *American Economic Review*, 106(4): 855–902.

[22] D. Shoag (2019). The Hamilton Project "Removing Barriers to Accessing High-Productivity Places".

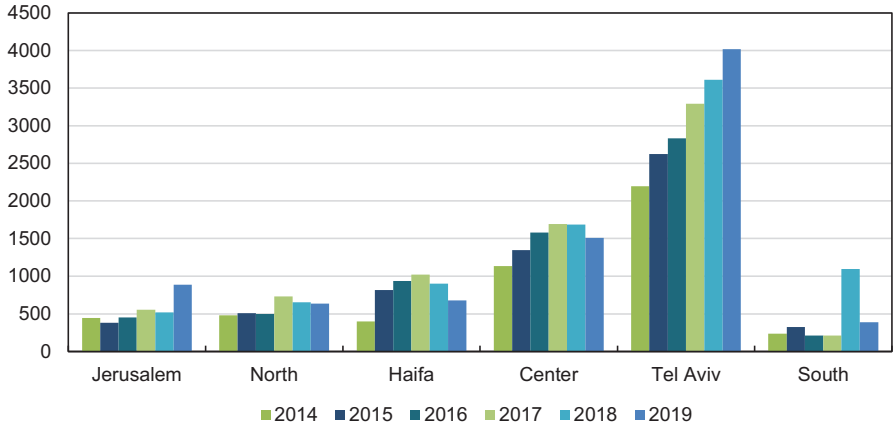
[23] This opinion even received additional empirical support in the work of G. M. Ahfeldt and E. Pietrostefani (2019). "The Eeconomic Effects of Density: A Synthesis" *Journal of Urban Economics*, 111: 93–107.

To utilize the advantages of densification within the framework of urban renewal, the government continues to advance vacate-and-build plans. Over the last two years, the number of dwellings approved in these plans (as a supplement to the planning inventory) has grown, and in 2019, about 19,200 supplemental dwellings[24] were approved through vacate and build—in accordance with the annual target.[25] About 65 percent of the homes approved are in the Center, mostly in two large projects in Lod and Rehovot, 15 percent are in Tel Aviv, 10 percent are in the South, and 8 percent are in Jerusalem[26] (Table 8.3). In 2017, the VATMAL, together with the Urban Renewal Authority, began to advance urban renewal programs of at least 500 housing units, some of which are neighborhood outline plans. The VATMAL's advancement of urban renewal projects substantially increased the number of home approvals. Another factor that helped promote urban renewal is the allocation of supplementary land for these projects to make them feasible.

In 2019, the volume of plans approved as part of urban renewal projects increased. Building starts in urban renewal projects account for about half of all building starts in the Tel Aviv district.

In 2019, building starts associated with urban renewal totaled some 10,800 housing units, an increase of 400 building starts compared with the figure for 2018 (Figure 8.7), of which 8,600 are supplemental starts. Half of them were built in the Tel Aviv district, where 50 percent of all the housing starts were associated with urban renewal. The number of building starts associated with urban renewal in the Center has been

Figure 8.7
District Distribution of Supplemental Building Starts in Urban Renewal Programs, 2014–19



SOURCE: Based on Central Bureau of Statistics. Data for 2019 are for the first three quarters of the year in annual terms.

[24] The number of supplemental dwellings is the number of apartments built minus those that are demolished.

[25] The average target for the period from 2017 to 2020 is 20,000, including construction on vacant sites (infills), but data are not available for planning and construction in these areas.

[26] As in previous years, no plans were approved in the North and only 86 apartments were approved in Haifa.

stable for the past three years, and is lower than the target set by the government.[27] However, thanks to the significant increase in the number of plans approved in the Center this year, the number of building starts associated with urban renewal in this region is expected to increase in the coming years.

The main tracks for urban renewal are TAMA (National Outline Plan) 38[28] and the vacate-and-build programs. TAMA 38 was approved in 2005 to encourage the reinforcement of buildings against earthquakes. Over time, another purpose—urban renewal—was added to the original goal.[29] The drawbacks of TAMA 38 projects are a potentially lower densification than in vacate-and-build projects, and that the issue of public spaces is not addressed, which leads to overload on the existing infrastructure since the planning is only for individual buildings.[30] TAMA 38 is due to expire in May 2020. A discussion on this subject held by the National Council in the Planning Administration on November 5, 2019 recommended that a transition period should be set, in which any application accepted by May 2022 would be dealt with as normal, and at the same time the local planning committee will decide whether to continue to apply TAMA 38 until 2025 and will also submit a long-term outline plan for urban renewal.[31] Either way, the final expiry date of TAMA 38 is due in May 2025, and the planning authorities intend to create instruments that will replace it by that date. Although in recent years TAMA 38 has accounted for 40 percent of urban renewal building starts, the original goal of strengthening buildings in areas with a tendency for seismic activity and a high risk of earthquakes was not achieved since it is not economically worthwhile in those areas, which are mostly in the periphery. Together with advancing urban renewal in the Center as an effective instrument for increasing urban density, supplementary tools must also be developed to facilitate the strengthening and protection of buildings in the periphery.

In recent years, about 40 percent of urban renewal building starts were part of the TAMA 38 program, but the original objective of the program—reinforcing buildings in areas that are at high risk of earthquakes—has not been achieved, since it is not economically worthwhile in those areas, most of which are in the periphery.

To mitigate the uncertainty regarding future changes, which in some cases impedes the implementation of projects, the Urban Renewal Authority is attempting to regulate the subject of payment to residents in vacate-and-build projects. For example, a document circulated in February 2020 defined an "appropriate" addition to the area of an apartment as an addition of 12 sq. m.

[27] Within the framework of the targets set in the Strategic Plan for the Housing Market in 2017, two targets for urban renewal were set at the regional level: implementation targets (supplemental building starts) and planning targets (increasing the planning inventory). The annual target for the Center is 3,000 housing units every year from 2017 through 2020.

[28] TAMA 38 offers two tracks: TAMA 38/1 – Reinforcement and Addition to Buildings, and TAMA 38/2 – Demolition and Reconstruction. The differences between these tracks are detailed in the Bank of Israel Annual Report for 2018, Chapter 9.

[29] In 2017 the High Court of Justice was asked to address the goals of TAMA 38 in a hearing on a petition, and it determined that TAMA 38 has a dual purpose.

[30] The advantage of TAMA 38 was the rapid advancement of projects. However, according to Planning Authority data, the time it takes from submitting an application to issuing a permit in TAMA 38 almost doubled between 2011 and 2018 (Planning Authority, TAMA 38, Meeting of the National Council, November 5, 2019). This advantage may therefore have been exhausted.

[31] Or a plan under Section 23 for the entire town or a significant part of it.

Table 8.3
Addition to the planning inventory in urban renewal projects, 2017–2019

(annual, thousands of additional units)

	2017	2018	2019	2020–2017 planning targets
North	0	0	0	1.9
Haifa	0	0.1	0.1	2.7
Center	1.4	1.9	12.4	6
Tel Aviv	2.5	7.6	2.8	6.8
Jerusalem	1.1	0.3	1.5	1.5
South	1	0	1.9	1.6
Total	6	9.9	19.2[a]	20.5

[a] Total including 600 units in Judea and Samaria.

SOURCE: Based on Urban Renewal Authority data.

(2) Umbrella agreements

In order to weaken the disincentive for municipalities to increase construction in their jurisdictions, a number of additional umbrella agreements were signed with the municipalities in 2019, but the realization rate of land marketing as a share of all agreements declined relative to 2018.

In recent years, the government has introduced a broad program aimed at counteracting the local authorities' negative incentive to absorb additional residents, in the form of umbrella agreements with the local authorities.[32] In this program, the government finances construction of the infrastructure and public buildings required for new neighborhoods on behalf of the local authorities.[33] By the end of 2019, 32 umbrella agreements—contracts between the local authorities and the Ministry of Housing or the Israel Land Authority—had been signed to expedite the construction of 395,000 housing units. The data in Table 8.4 show that by the end of 2019, land for homes equal to 35 percent of the marketing targets for that period had been successfully marketed[34]—a decline compared with 2018, in which the percentage actually marketed in the umbrella agreements was 42 percent. Alongside the difficulty of marketing new homes in the periphery due to lower demand, opposition from several mayors also contributed to the slowdown, which delayed the issue of building permits for projects included under the umbrella agreements due to a lack of infrastructure. If this trend continues, it will adversely affect the developers' willingness to submit bids for land tenders in the local authorities in which there are umbrella agreements, due to concern that in the final outcome, they will have difficulty exercising their wins.

Supply in the long term: As noted, the process of producing a dwelling is a long process, with actual construction dependent on the approval of plans and on land marketing several years earlier. Long-term strategic planning is therefore extremely

[32] For a broad explanation of this program, see the Bank of Israel Annual Report for 2017.

[33] In some cases, the infrastructures and public buildings to be built will also serve residents of the older neighborhoods.

[34] Meaning actually sold: housing units in tenders with a winner.

Table 8.4
Umbrella agreement marketing targets and actual marketing, 2019

Locality	Signature date	Housing units in the agreement[a]	Marketing targets to the end of 2019[b]	Actual marketing	Actual marketing rate (percent)
Kiryat Gat	11.2013	6,442	6,442	5,262	81.7
Kiryat Gat - agreement increment	2.2019	7,164	2,000	-	0.0
Modi'in	1.2014	11,804	11,804	6,843	58.0
Kiryat Bialik	1.2014	7,253	7,253	2,132	29.4
Rosh HaAyin	2.2014	13,636	13,636	5,759	42.2
Rishon LeZion	11.2014	16,393	10,000	6,204	62.0
Ramla	7.2015	7,483	7,483	2,350	31.4
Ashkelon	12.2015	31,791	10,000	11,105	111.1
Be'er Sheva	10.2015	18,140	18,140	5,250	28.9
Herzliya	1.2016	7,443	7,443	1,468	19.7
Netanya	4.2016	12,288	8,000	2,185	27.3
Yavneh	8.2016	12,699	8,000	2,367	29.6
Tirat Carmel	9.2016	7,986	7,986	2,094	26.2
Afula	9.2016	10,496	8,000	190	2.4
Ma'alot	2.2017	5,545	4,750	325	6.8
Ofakim	2.2017	14,436	10,000	2,213	22.1
Eilat	3.2017	18,372	8,000	863	10.8
Beit Shemesh	4.2017	13,007	8,697	7,902	90.9
Or Yehuda	4.2017	5,020	5,020	2,135	42.5
Acco	5.2017	11,968	6,000	1,200	20.0
Lod	5.2017	17,018	7,080	799	11.3
Be'er Yaakov	5.2017	11,653	6,000	2,235	37.3
Ashdod	8.2017	30,046	9,436	-	0.0
Migdal HaEmek	8.2017	4,985	4,985	1,524	30.6
Dimona	9.2017	15,657	5,204	594	11.4
Nahariya	9.2017	7,422	6,000	2,708	45.1
Netivot	12.2017	13,103	6,000	3,374	56.2
Sderot	1.2018	5,498	5,498	302	5.5
Haifa	3.2018	15,623	2,000	431	21.6
Elad	3.2018	5,222	5,222		0.0
Jerusalem	3.19	11,953	2,000	1,834	91.7
Yehud	10.19	7,313	2,000	-	0.0
Ramat Gan	12.19	8,722	-	-	0.0
Total		**393,581**	**230,079**	**81,648**	**35.00**

[a] Excluding special housing (protected housing, dormitories, etc.), additional housing units pursuant to the Sheves regulations, and urban renewal. Housing units on State-owned land only.

[b] Marketing targets subject to approval of the plans in the preparation and approvals process.

SOURCE: Based on Ministry of Construction and Housing and Israel Land Authority.

Various housing market indicators point to a high level of activity, and the volume of building starts is in line with the target set for the years 2017–2020. However, construction targets dictated by Will increase from 2021.

important. In 2017, the housing cabinet formulated the Strategic Plan for the Housing Market, which sets out the planning and construction targets for 2017–2040 based on projected housing needs. According to this plan, Israel's housing needs dictate targets for the construction of 52,000 housing units between 2017 and 2020[35], 55,000 housing units between 2021 and 2025, and a gradual increase to 67,000 units in the period from 2036 to 2040. The number of building starts in 2017–2019 did in fact meet the defined targets, but due to a shortage of available land for construction in the areas of demand, the relatively low density coefficients defined in TAMA 35[36] (which was approved in 2005) will make it extremely difficult to meet the targets of the Strategic Plan for the Housing Market. In order to help achieve the government's planning and building targets, in August 2019, the National Council for Planning and Construction approved the expedition of the Building Authority's initiative to amend TAMA 35, the goal of which was to increase population density in Israel's cities. The amendment is expected to help achieve the government's targets. To avoid harming the residents' quality of life, the increased densification requires the corresponding planning of employment and public services, and the planning and expansion of the mass transit system.

3. THE DEMAND FOR HOUSING AND HOUSING TRANSACTIONS

The Buyer's Price program increased demand for homes due to the subsidy, but actual transaction data reflect a decline in the initial years. In 2018, when the first contracts started to be signed with lottery winners, the volume of transactions by first home buyers returned to its 2015–16 level, and the numbers continued to grown in 2019, when additional projects reached the building permit stage.

The factors that have led to greater demand since 2015 are the growth of the prime working age population (25–64)[37], the increase in real household income, the low unemployment rate, and low interest rates (Table 8.1). Additionally, the government has introduced several policy measures that have had a direct impact on the demand for housing. In 2015, in an effort to discourage investors from investing in the housing market, it increased the purchase tax imposed on real estate investors. The demand for housing by investors therefore dropped, and between 2015 and 2017 the number of investment transactions fell by half. Another policy measure was the introduction of the "Buyer's Price" program, aimed at helping households that do not own a home to purchase one. The program increased the demand for housing by granting subsidies, but the actual data on transactions reflected a decline in the initial years, as those eligible to participate waited to win the lottery, and then waited again for the approval and construction processes to proceed until building permits were received and the contracts could be signed. The Buyer's Price lotteries began in September 2016, and the number of transactions by first-time home buyers in 2017 (Figure 8.8) was actually lower than in 2016. In 2018, when the first contracts were signed by the

[35] In annual terms.

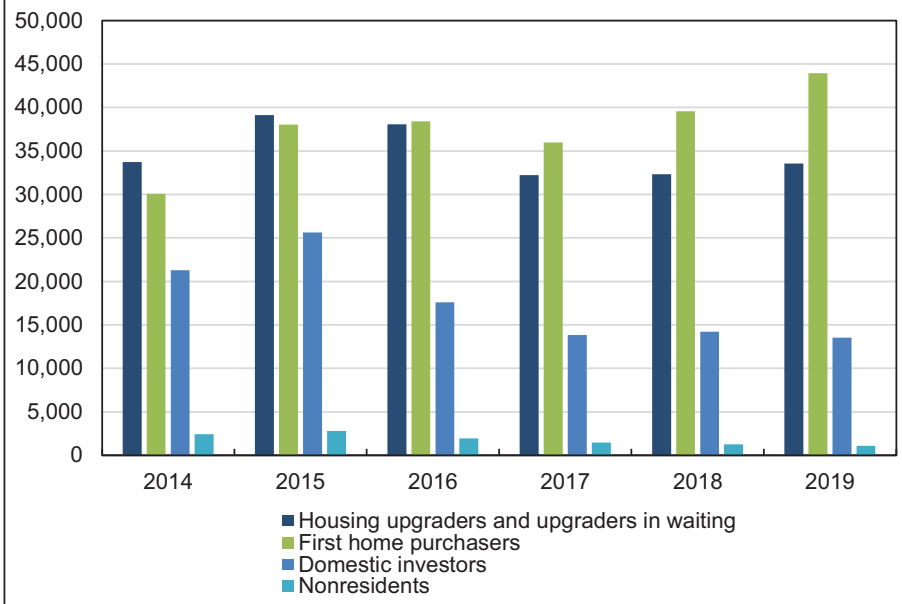
[36] The Comprehensive National Outline Plan for Construction, Development and Conservation. The purpose of the plan is to define planning policy and the distribution of localities throughout Israel until 2020.

[37] The indicator for housing requirements is the number of households, but it is difficult to measure and use—partly because it is endogenous to the inventory of homes, namely it is influenced by it. In contrast, population data are exogenous to the housing market.

lottery winners, the number of transactions by first-time buyers increased, returning to the 2015–2016 level, and the number of transactions continued to increase in 2019 when additional projects reached the building permit stage. During the year, the number of Buyer's Price transactions increased to about 15,000 (out of about 44,000 transactions by first-time home buyers). Figure 8.9 presents the breakdown of the transactions made by first-time buyers, and shows that most of the increase is in Buyer's Price transactions.

The number of transactions by investors in the first three quarters of 2019 was similar to the number in the corresponding period in 2018. Likewise, the trend of increased investment in real estate abroad, continued: In the first three quarters of 2019, net household investment in real estate abroad was $500 million, 5 percent higher in quarterly terms than in 2018. The volume of the increase in investments in real estate abroad is the equivalent of one-fifth of the decline in investment by local investors in housing in Israel. It therefore follows that Israeli households view the option of investing in real estate abroad as a poor alternative to investing in housing in Israel.

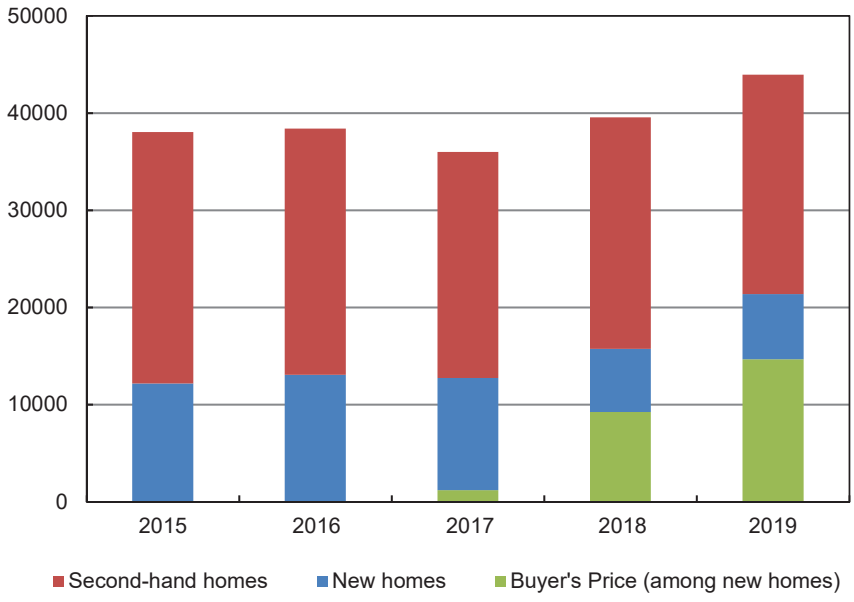
Figure 8.8
Annual Number of Transactions by Type of Purchaser, 2014–19



[a] Housing upgraders in waiting are households that have purchased a new home before selling their previous one.

SOURCE: Based on Israel Tax Authority, CARMAN file.

Figure 8.9
First-Home Buyers, Annual Data, 2015–19



SOURCE: Based on Central Bureau of Statistics and Israel Tax Authority, CARMAN file.

Housing upgraders – additional information

In 2019, there were 95,000 transactions involving residential housing, of which more than half were second-hand dwellings. Second-hand transactions are an important component of the housing market and one of its main segments is transactions by housing upgraders.

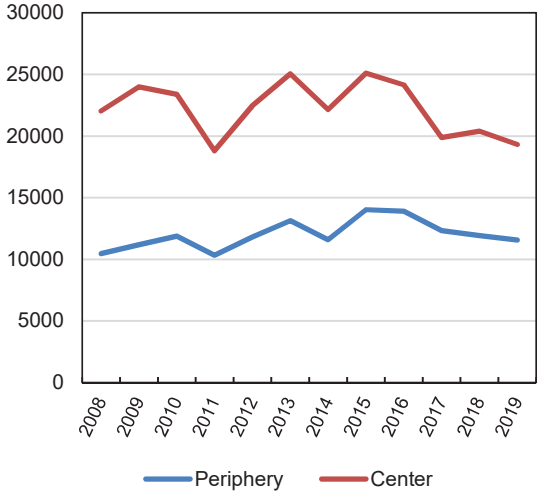
Until 2012, housing upgraders accounted for a greater share of the market than first-time home buyers. In 2012, the number of transactions by first-time buyers surpassed the number of housing upgrade transactions, and since 2015 the gap between the two has widened (Figure 8.1). In 2019, the number of housing upgrade purchases was slightly lower than in 2008, even though the population in the 35 and older age group[38] increased in this period.

Household characteristics change over time, and with them their housing requirements. In Israel, the change in the housing requirements of households is more noticeable than in other developed countries due to the relatively large number of children. Fewer transactions by housing upgraders could indicate a growing mismatch between housing requirements and housing characteristics, implying a lower level of efficiency and wellbeing. It is therefore important to investigate the factors

[38] According to Ministry of Finance data from 2010 the average age of housing upgraders is 45 and most of the housing upgraders are aged 35 or above.

underlying the decline in the number of housing upgrade transactions. Since an analysis of the trends among first-time home buyers was presented in the Bank of Israel's Selected Research and Policy Analysis Notes, February 2019, this report will focus on the trends and characteristics of housing upgrade transactions.

Figure 8.10
Number of Transactions of Housing Upgraders, by Area, 2008–19



SOURCE: Based on Israel Tax Authority, CARMAN file.

To examine whether a drop in the number of housing upgrade transactions is representative of the entire market, or can be attributed to a decline in the demand for second-hand dwellings (the homes being sold by the upgraders) in the periphery, we examined the trends in transactions by housing upgraders in peripheral areas and in the center of the country (Figure 8.10).[39] It appears that although the number of transactions in the Center is higher than in the periphery, the differences in the trends between the two areas are not significant: in both cases, the number of transactions was stable until 2016, after which it declined.

The decline in the number of transactions occurred in parallel with the departure of investors from the market, and also corresponds with the increase in the number of Buyer's Price lotteries. To assess which segment of the second-hand home buyers led the decline in the number of housing upgrade transactions, we examined the upgrade transactions according to the category of buyer who purchased the upgraders' previous homes: first-time home buyers, investors (local and foreign), and other housing upgraders.[40] The distribution of buyers over time is presented in Table 8.5. We note

The decline in transactions by housing upgraders was due to the decline in demand for their previous homes—mainly by investors due to their departure from the market.

[39] The classification was made according to the Central Bureau of Statistics Peripherality Index, based on the method proposed by E. Feitelson et al. (2019). Clusters 1–5 are defined as periphery and clusters 6–10 as center. A sensitivity analysis shows that defining clusters 8–10 as center and/or the defining areas 1–4 as periphery does not affect the results.

[40] To classify the buyers of the housing upgraders' previous homes, we conducted a one-on-one comparison between the transaction involving the purchase of the new home and the sale of the previous home with respect to individuals defined in the Carman Index as "housing upgraders". Several optimizations were made: (1) we reduced the sample to individuals who performed no more than 3 housing upgrade transactions; (2) regarding the housing upgraders who purchased a new home before selling their previous home, the maximum period in which two homes were held was two years (those who remained in possession of two homes for more than two years were not included in the sample); and (3) for housing upgraders who sold a home before purchasing a new apartment, the maximum period without any home ownership is 3 years.

that the number of transactions between upgraders and all groups of buyers declined, but the most significant decline (in percent) was in sales to investors. Removing them from the equation reduced the number of households that were able to sell their homes in order to purchase a new one. This reflects one of the effects of the government's policy, the purpose of which is to limit the purchase of homes by those who are not purchasing a sole dwelling.

Table 8.5
Distribution of housing upgraders' sales by purchaser type, 2019

	Sales to investors		Sales to first-home purchasers		Sales to other upgraders	
	Periphery	Center	Periphery	Center	Periphery	Center
2011–2015	8,543	10,827	17,297	24,395	18,439	24,283
2016–2019	4,582	5,762	13,673	15,985	13,684	17,674

SOURCE: Based on Israel Tax Authority, CARMAN file.

In addition to the difficulty faced by upgraders in selling their homes, rising home prices may also have contributed to the decrease in the number of housing upgrade transactions. When housing prices rise, individuals planning to purchase a cheaper home will experience the impact of positive income, while individuals who are planning to purchase a more expensive home will experience negative income. Consequently, if rising home prices did in fact contribute to a drop in the number of upgrade transactions, we would expect to see a significant drop in the number of transactions among those home owners replacing their homes with a substantially more expensive home, but not in the number of transactions in which the owners move to a cheaper home or where the new home is less than 25 percent more expensive than the previous home. By cross-referencing the sale and purchase transactions of housing upgraders, we can examine the distribution of these transactions according to the change in the value and size of the dwelling (Table 8.6).

The percentage of upgraders moving to a more expensive dwelling[41] as a share of all housing upgraders declined over time by 10 percentage points, and the percentage of upgraders for whom the difference between the value of their new home and that of their old home was less than NIS 375,000 (in either direction) rose by 9 percentage points. The percentage of those moving to a larger home (by at least 15 sq. m.) did not change[42] over the period (2007–2019). Of those moving to a

[41] A NIS 375,000 increase in the value of a home in 2019 prices (NIS 220,000 in terms of prices at the beginning of 2010) is expressed as a 25 percent change in the price of the average home, which in 2019 was NIS 1.5 million. We regard a change of this size as an indication of a significant change in the value of the home.

[42] Increased by 2 percentage points between 2007–2009 and 2010–2015 and dropped by 2 percentage points in 2016–2019.

larger home, the percentage who moved to a more expensive dwelling dropped by 7 percentage points. We can therefore conclude that demographic changes, and in particular an increase in the number of children, push some households to move to larger homes, but in view of the price increases, fewer of them move to a home that is worth significantly more than their previous home, while it appears that the others compromise with respect to other features of the dwelling.

Table 8.6
Distribution of housing upgraders by changes in area and in price between the home being sold and the home being purchased, 2015–2019

(as a share of total upgraders during the period)

	Home value increased by at least NIS 375,000			Change of less than NIS 375,000			Value declined by more than NIS 375,000			Total		
	2007-2009	2015-2010	2016-2019	2007-2009	2010-2015	2016-2019	2007-2009	2010-2015	2016-2019	2007-2009	2010-2015	2016-2019
Area increased by more than 15 sq.m.	46	44	39	15	19	22	2	2	3	63	65	63
Change in area of less than 15 sq.m.	6	5	5	8	9	10	2	2	2	15	16	16
Area declined by more than 15 sq.m.	5	4	4	8	8	9	8	8	8	21	20	21
Total	**57**	**53**	**47**	**31**	**36**	**40**	**12**	**11**	**13**	**100**	**100**	**100**

Note: For each of the periods, the sum totals 100 percent.
SOURCE: Based on Israel Tax Authority CARMAN file.

4. PRICES

Due to the increase in demand during 2019, home prices increased by 3 percent.

In the decade until 2018 housing prices rose, and during the course of 2018 they dropped by 1.2 percent. In 2019, this trend resumed and according to the most recent Dwellings Price Index figure (November–December 2019), prices rose at an annual rate of 3 percent, the highest rate since November 2017. The factors underlying the rising home prices in 2019 include, among others, political uncertainty, particularly regarding the government's future housing policy; falling long-term interest rates, which are also reflected in lower interest rates on mortgages, reducing the financing costs for home buyers, and thereby lowering monthly repayments; and the tight labor market, which is reflected in the continuing increase of real household income and the low unemployment rate, reflecting a high level of job security. On the supply side, the change in building costs was relatively small—an increase of 0.6 percent—and it is therefore unlikely to contribute significantly to rising home prices. Data from the Business Tendency Survey do not reflect any significant supply limitations in the construction industry, and regarding land marketed by the Israel Land Authority—at least in the periphery—quite a number of tenders remained without a winner.

The demand for owner-occupied housing reflects not only demand for housing services, but also demand for housing as an investment product. Therefore, changes in the price of owner-occupied housing do not necessarily represent changes in demand for housing services relative to supply. In contrast, it is rent that should represent changes in the demand for housing services relative to supply, since renters purchase housing services only, without the element of investment in the property. In the long term the prices of owner-occupied housing, rental prices, and yields in the market are closely interrelated (for details, see Box 8.1). In the short term, an increase in rents is evidence of increased demand for housing services relative to supply. The annual rate of increase in the owner-occupied housing services index (which is measured according to rent) in 2019 was 2.8 percent, slightly above the average increase of the index from 2010 (in real terms). In 2012–2018, the rate of increase of rent (owner-occupied housing services index) was more moderate than that of net real household income[43], whereas in 2019, the increase in the owner-occupied housing services index was close to the rate of change in net real income. This change may indicate that the increase in demand for housing services is greater than the increase in supply. Data on the change in average rents in 2019 by geographical area do not provide evidence of significant differences between high-demand areas and the periphery.

5. BUYER'S PRICE

Since the start of the Buyer's Price program, about 70,000 households have won eligibility to purchase a home at a lower price, of which about 26,000 have actually purchased a home.

The Buyer's Price program aims to help young couples, and individuals over the age of 35[44], who did not own any property rights in the past six years, to purchase a home.[45] The program began to operate in 2015 and was due to run for 5 years.[46] In November 2019, the Israel Land Council decided to extend the program until the end of 2020. Since the program began, 190,000 households have received a certificate of eligibility enabling them to participate in a lottery (an addition of 40,000 households in 2019), and about 70,000 households won the right to purchase a home at a reduced price, of which 26,000 had actually purchased a home through the program by November 2019. According to data published by the Ministry of Construction and Housing, by the end of 2019, 5,500 winners had received their homes (since the program began) and a further 12,000 are expected to receive their homes by the end of 2020. The program helped to slow price increases in the periphery, but in high-demand areas, demand continues to outpace supply.

The program helps households that do not own a home to purchase a subsidized apartment, but the discount incorporated in the price may change substantially from

[43] Of course, the supply of labor by households may be affected by the state of the housing market. For a discussion, see "The Connection between the Increase in Housing Prices and the Supply of Labor in the Past Decade by Home Ownership", Bank of Israel Annual Report for 2015, Chapter 5.

[44] Disabled persons from the age of 21.

[45] This period was recently shortened to 3 years.

[46] For additional information about the program, see Chapter 9 in the Bank of Israel Annual Report for 2017.

one project to another, and for the most part, projects in high-demand areas incorporate a more significant discount (in shekels, not necessarily in percent) than projects in the periphery. The State therefore began to formulate a plan to curb the discounts in the Buyer's Price program.[47]

According to data in the government's financial statements for 2018, its loss of income in respect of the discounts given on land[48] in 2018 and in the first quarter of 2019 was NIS 1.9 billion, and the additional subsidy and purchase grants in this period amounted to NIS 530 million. From the time it was launched in 2015 until March 31, 2019, the program has cost NIS 7.7 billion.[49]

The expansion of supply in the periphery has apparently created sufficient response to demand, and price increases have been halted.

Table 8.7 presents the results of the lotteries, including details of the winners allocated region (center or periphery). The table shows that throughout the period, the percentage of apartments left without a winner in the periphery is significantly higher than in the center of the country, apparently due to lower demand in the periphery and to a smaller discount on projects in the periphery. The table also shows that the percentage of leftover apartments increased significantly between 2016 and 2017, but that in the last two years it declined in both the center and the periphery. The reason for this is a reduction of the supply of projects in the periphery, corresponding with lower demand and fewer developers participating in the land marketing tenders in projects where little or no demand is expected by those eligible, so that these projects do not reach the lottery stage (Table 8.8). Additionally, other groups such as housing upgraders were given the option to participate in the program, and the apartments that

Table 8.7
Rate of homes with no winner in the initial "Buyer's Price" lotteries, 2016–19

(thousands)

	Center				Periphery			
	2016	2017	2018	2019	2016	2017	2018	2019
Awarded in lotteries	2.2	21. 7	6	6.1	3.4	13.7	9.3	4.3
Winners	2	18.2	5.8	6.1	2.4	6.6	6	3.9
Rate of homes with no winner	8.6%	16.1%	2.3%	0.4%	27.5%	51.7%	35.3%	8.8%

SOURCE: Based on Israel Land Authority.

[47] Until now, prices were derived from assessments prepared by the GovernmentAssessor in 2015 and have not been revised since then. In February 2020, the Israel Land Authority began to formulate a series of measures to restrict the discounts that the contractors offer to those eligible in the Buyer's Price programs. These include an upward revision of the price of the land sold to the contractors, limiting the number of apartments to be sold on the open market, and setting an upper limit on the discount on an apartment.

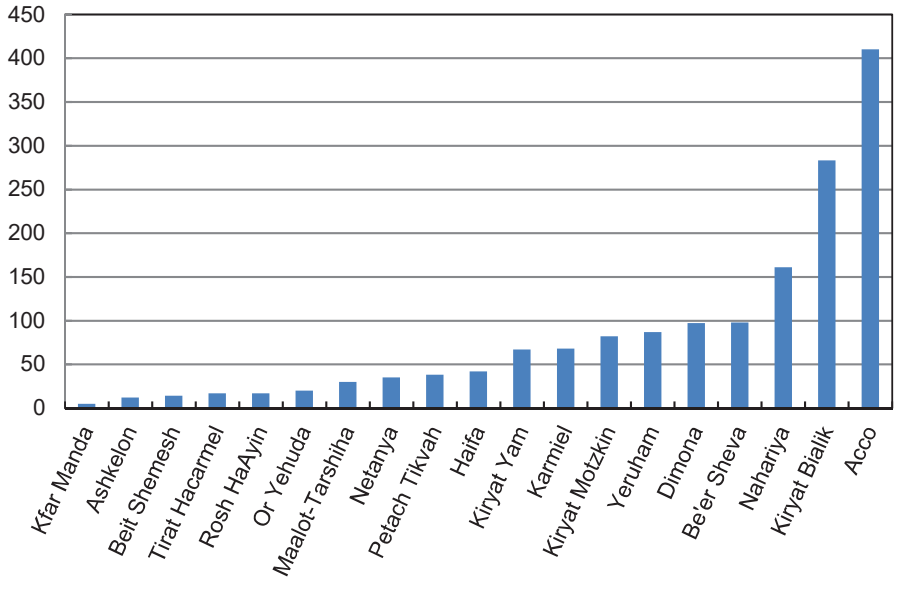
[48] A discount of up to NIS 120,000 per housing unit is given. In locations in which the average value of the land per housing unit is less than NIS 150,000, a discount of 80 percent of the value of the land is given, and in locations in which this value is higher, the discount is NIS 120,000.

[49] Of which NIS 5.6 billion is a loss of income in respect of the discounts on land and NIS 2.1 billion is the additional subsidy and purchase grants. These amounts do not include the cost of the guarantees that the State provides as part of the program, or the expenses associated with the umbrella agreements.

were not successfully marketed in the tenders were sold at a reduced price to anyone with a certificate of eligibility. Since winners may waive their win, the percentage of apartments left with no winners is not the same as the percentage of apartments that remained "on the shelf" at the end of the lotteries. The distribution of the apartments that remained "on the shelf" appears in Figure 8.11, which shows that most of them are in the periphery. Expansion of the supply in the periphery seems to have created an adequate response to demand. Prices stopped rising, and there was even some surplus supply.

The distribution of projects by building permit status shows that about half the projects for which lotteries were held in 2018 received a permit (Figure 8.12), and the distribution of winners by project status shows that half of the winners in 2017 are at the stage of choosing the apartment or contract examination (Figure 8.13).[50]

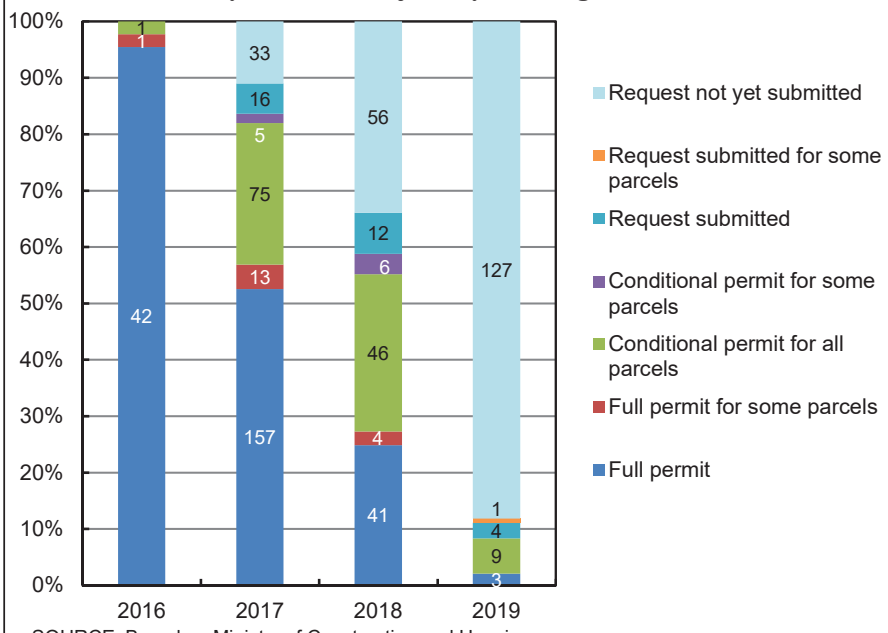
Figure 8.11
Homes Offered for Sale to Eligible Buyers Without a Lottery in Cities with Buyer's Price Lotteries, 2019:Q4



SOURCE: Based on Ministry of Construction and Housing.

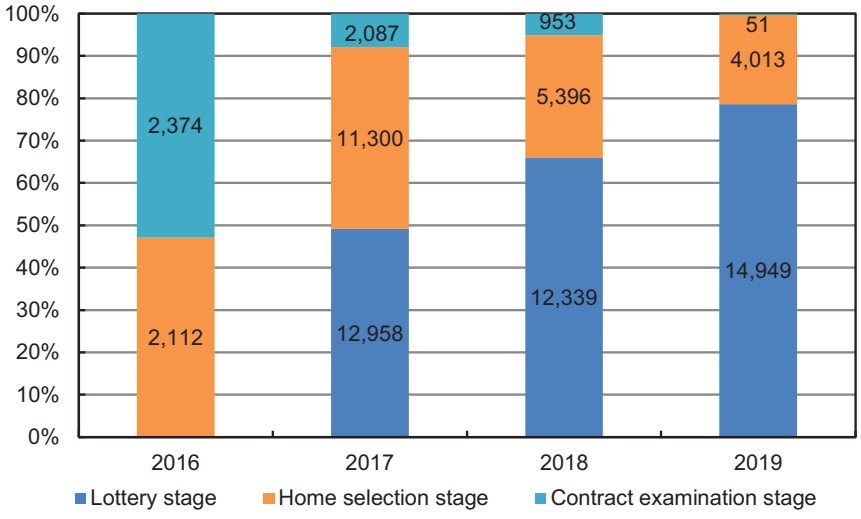
[50] As of the end of 2019.

Figure 8.12
Distribution of Buyer's Price Projects by Building Permit Status, 2016–19



SOURCE: Based on Ministry of Construction and Housing.

Figure 8.13
Distribution of Buyer's Price Lottery Winners by Project Stage, 2016–19



*Homes in the post-occupancy control stage: 21 in 2017, and 6 in 2018.
SOURCE: Based on Ministry of Construction and Housing.

Table 8.8
Buyer's Price tenders, 2015–19

(housing units)

Year	Center				Periphery			
	No winner	Winner	Percentage with no winner	Total	No winner	Winner	Percentage with no winner	Total
2015	733	4,664	14%	5,397	409	2,164	16%	2,573
2016	5,308	8,553	38%	13,861	6,665	11,186	37%	17,851
2017	5,217	17,211	23%	22,428	10,448	12,292	46%	22,740
2018	9,887	9,752	50%	19,639	11,640	14,621	44%	26,261
2019	2,435	9,825	20%	12,260	13,095	6,255	68%	19,350
Total	23,580	50,005	32%	73,585	42,257	46,518	48%	88,775

SOURCE: Based on Israel Land Authority.

Box 8.1

Effect of long-term factors on housing prices

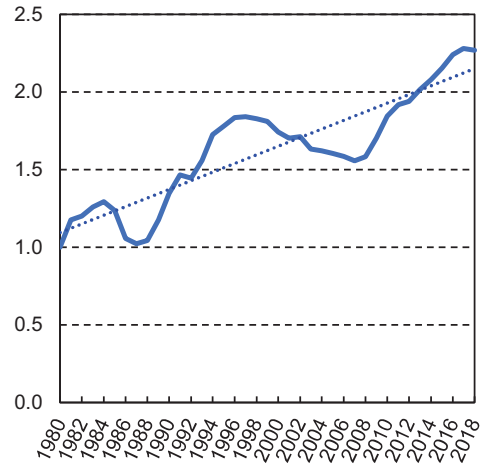
- Two principal long-term forces influence housing prices: (1) the difference between the demographic needs for housing and the inventory of homes; and (2) the deviation of housing prices from their basic value, which compares the relationship between rent and housing prices with the alternative yield in the capital market (the forward yield of long-term interest rates).
- The inventory of homes was found to be lower than what would be derived from its long-term level with respect to demographic needs, a factor which supports the continuing increase of housing prices.
- In contrast, it was found that housing is overpriced compared with the price derived from its basic value. This works to lower housing prices.
- The net estimated effect of these two factors together indicates a certain downward pressure on housing prices. Nonetheless, it should be emphasized that in the short term, housing prices are influenced by other factors such as progress made in the Buyer's Price program and changes in monetary policy, which are not examined in this box.

1. INTRODUCTION

Home prices are influenced by short-term and long-term factors. The short-term factors include the business cycle's position in the economy, the number of building starts, the market's response to government programs, and more. The long-term factors represent equilibrium relationships that are present in the housing market over time. In this box, we will focus on two of them: the asset pricing equation, which ties rents and the real long-term interest rate to housing prices, and the connection between the inventory of homes and demographic growth. After presenting the long-term factors, we will present estimations of their size.

The long-term relationships have been estimated for the Israeli economy in the past.[1] The advantage of the estimation presented here is that it is based on a

Figure 1
Index of Real Home Prices (log), 1980–2018
(net of the Consumer Price Index excluding housing, 1980=1)



The slope of the trend line is 0.028, meaning that in the past four decades, the average rate of price increases was about 2.8 percent per year in real terms.

[1] See: W. Nagar and G. Segal (2011). "What Explains the Developments in Home Prices and Rents in Israel between 1999 and 2010", Bank of Israel Survey, 85:. 7–59 (in Hebrew); D. Weiner and F. Fuerst (2017). "The Dynamics of House Prices in Israel and the Effect of the Investor's Fear Gauge", Journal of Housing Research, 26(1): 95–116; M. Bar-Nathan, M. Beenstock, and Y. Haitovsky (1998). "The Market for Housing in Israel", Regional Science and Urban Economics, 28: 121–149.

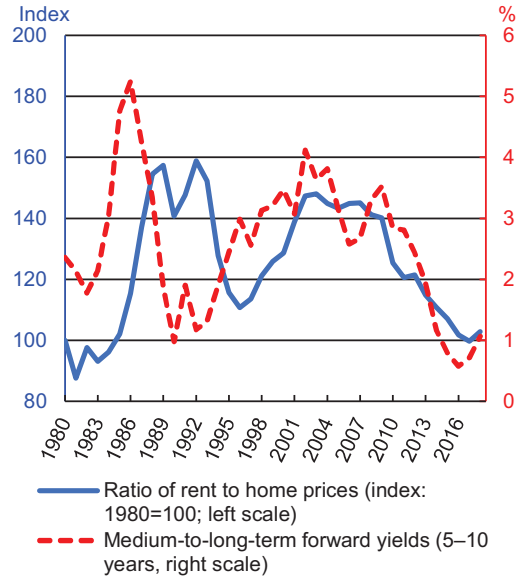
long sample of 40 years from 1980 through 2018.[2] This contrasts with previous studies that estimated shorter samples, and in some cases even included less than one cycle in the housing market—making it impossible to properly distinguish between the cyclical movement in the market and the long-term trend.

Figure 1 presents housing prices in real terms (net of the Consumer Price Index excluding housing) over the last four decades. The graph describes the long cycles in the housing market, and our sample covers three boom periods.

2. LONG-TERM FORCES

The asset pricing equation: Like other financial assets, the value of housing can also be estimated by means of capitalizing the flow of income they are expected to produce. Since the income received from a dwelling is the rent[3], the value of the dwelling is estimated by capitalizing the flow of rent that it produces. Over time, we would expect that the actual prices of the dwellings should be equal, on average, to their value derived from the asset pricing equation, and we therefore expect that the yield on the dwellings (the relationship between rent and price of the dwelling) will approximately equal the real alternative yield from the capital market.[4] Even though there may be periods in which the relationship between rent and the home prices deviates from the alternative yield, this gap cannot persist, and in the long term it will eventually close. When the equilibrium of the asset pricing equation is upset, for example when the increase in home prices lowers the yield on apartments without a similar drop in capital market yields, ownership of an apartment becomes less profitable and there will be a corresponding drop in the demand to purchase housing. The result will be the creation of downward pressure on home prices, which in turn pushes up the yield from dwellings until the equilibrium between the yields is eventually restored.

Figure 2
Ratio of Rent to Home Prices, and Real Forward Medium-to-Long-Term Yields, 1980–2018



[2] It appears that until the end of the 1970s, the ratio of population to the inventory of homes gradually declined, a reflection of the ongoing process of immigration absorption in the early decades of the State. This period therefore does not properly represent the long-term relationships between the inventory of homes and demographic growth. From 1980, the ratio of population to inventory has been fairly stable and we therefore chose to begin the sample with that year.

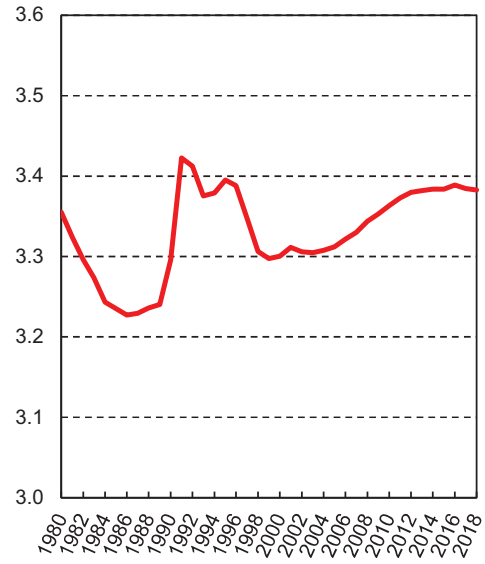
[3] In principle, various expenses such as taxation, maintenance, and wear-and-tear should be deducted from the rent.

[4] The long-term asset pricing equation is given as: Price = Rent/Fwd_Rate where price is the price of the dwelling, rent is the rent, and Fwd_Rate is the real, long-term forward yield.

Figure 2 presents the relationship between rent and home prices and the real forward yield in the intermediate and long term (5–10 years) on government bonds. Prices are measured by means of the Central Bureau of Statistics Index of Home Prices, and to measure rent we used the Owner-Occupied Housing Services item in the Consumer Price Index from 1999 and the rent item in the Consumer Price Index for earlier periods.[5] The graph shows the positive correlation between the series, excluding the period around the wave of immigration in the early 1990s. The integrated movement of rent, home prices, and forward yield therefore seems to be approximately aligned with the long-term relationship, similar to that derived from the asset pricing equation described above.

Inventory of homes versus demography: The relationship between the inventory of homes and demography is derived from the fact that over time the inventory of homes must expand to meet the population's housing requirements. The demand for housing increases with population growth, and the inventory of homes must therefore also adjust itself and increase accordingly. This may take place through market forces in the form of rising prices, which triggers an increase in the supply of construction, or through government planning. The relationship between population size and the inventory of homes is also influenced by household size, particularly when the inventory of homes is measured using the number of housing units, and these are in fact the data available to us.[6] When average household size increases, fewer dwellings are needed for a given population size. We therefore use both population size and average household size in the econometric representation of demographic needs.[7]

Figure 3
Population Relative to the Stock of Homes, 1980–2018



[5] From 1999, the Owner-Occupied Housing Services item is measured using the rent in new and renewed contracts (the spot price in the market). The Rent item is measured by means of all the contracts in force at the time of the measurement, including those whose price was set in the past.

[6] It is preferable to measure inventory by means of built area, but we do not have data for this.

[7] In principle, demography should be measured according to the number of households, but this method of measurement does not suit our purpose. Specifically, the Central Bureau of Statistics defined a household as a person or group of people who live together permanently in a single dwelling, and who share a budget for food expenses. When housing prices rise there is a responding increase in housing density and several households will tend to reside under one roof. For example, young couples may remain in their parents' home. In this state of affairs, the method of measurement, as defined by the Central Bureau of Statistics, may underestimate the indicative number of households with respect to the demand for housing that we wish to estimate.

Figure 3 presents the ratio of population to inventory of homes as an indication of the relationship between demographic growth and the inventory of homes.[8] The Figure shows that the relationship is relatively stable, ranging from 3.2 to 3.4 persons per dwelling. In the main period of increase, in the first half of the 1990s, the change in the ratio is not small (6 percent), but it is lower than the change in the size of the population—reflecting the housing inventory's response to population growth derived from the long-term relationship between them.

As noted, both the above relationships are long-term relationships. In other words, they would be expected to remain in close proximity over time, but not necessarily at any given point in time. Sometimes, homes will be overpriced relative to rent, and at other times they will be underpriced. In some periods there will be a surplus of dwellings relative to demographics and in others there will be a shortage. Any deviations from the long-term relationship affect prices in the short term. A housing shortage will push housing prices up, and over-pricing will exert pressure to lower prices. Nevertheless, the actual change in prices is the outcome of all the forces at work in the market (long-term and short-term), and they will not necessarily all work in the same direction.

3. THE ESTIMATION

The following is a presentation of the econometric formula for the long-term relationships and the results of the estimation. We estimate the long-term relationships using the following two regressions:

(1) $$log(Price_t) = \beta_0 + \beta_1 log(Rent_t) + \beta_2 log(Fwd\_Rate_t) + u_t$$

(2) $$log(Housing\_Stock_t) = \gamma_0 + \gamma_1 log(Pop_t) + \gamma_2 \frac{Pop_t}{HH_t} + v_t$$

Regression (1) is the asset pricing equation. Home prices (Price) and rent (Rent) are expressed in real terms, and the two series are adjusted for the Consumer Price Index, excluding housing. The alternative yield (Fwd_Rate) is the real forward yield of 5–10 year government bonds. Regression (2) is the relationship between the inventory of homes (Housing_Stock) and demographic growth, which is measured by means of population (Pop) and average household size (Pop/HH). All the series are expressed as an annual average and, as noted above, the period of the estimation is 1980–2018.

Panel A in Table 1 presents the results of the estimation for the asset pricing equation, Regression (1). The coefficients are obtained with the correct indication—positive for rent and negative for the alternative yield—but they do not seem to equal their theoretical value as implied by the asset pricing equation (1 for rent and -1 for yield). Nonetheless, an ADF test presented in the table supports the stability of the relationship between the variables over time, and the estimation therefore appears to support the long-

[8] The inventory of homes was calculated indirectly by means of linking data on building completions to the inventory data for 1995, which are based on the population and housing census conducted in that year. Data up to 1995 are based on the data of Bar-Nathan, Beenstock, and Haitovsky (1998) (see Footnote 1).

term relationship between the variables, even if the value of the coefficients does not correspond precisely to the theoretical regression.

The residuals in this estimation appear in Figure 4. A positive residual implies that actual home prices are higher than the value derived from the rent level and yields, and in this case we would expect prices to drop (and/or rents to increase) so that the market returns to equilibrium in the long term. It appears that since 2010, the residuals have been positive, meaning that home prices are higher than that derived from the asset pricing equation, and relative to previous periods they are high. The positive residual is evidence of the long-term force exerted to lower housing prices. The figure also shows that in 2007, immediately before prices began to increase, the estimated residual reached a negative low confirming that homes were underpriced, and this apparently was one of the factors underlying the subsequent sharp price increase.

Panel B in Table 1 presents the results of the estimation of the relationship between the inventory of homes and demography, Regression (2). The coefficient estimations are obtained with the expected indication. The population variable is positive and the variable for average household size is negative. In other words, as a rule, population growth increases the inventory of homes, but population growth that is accompanied by an increase in the average household size implies an increase in density, which partially offsets the population's effect on inventory. Furthermore, the ADF test shows that the relationship between the variables is stable over time, and the estimation therefore supports the long-term relationship between the variables.

Table 1: Estimated long-term connections, 1980–2018 (yearly frequency)

Panel A: Asset pricing	Dependent variable: Log(price)	Probability
Log(rent)	0.798	0
Log(rent_future)	-0.1252	0.0134
Fixed	0.5978	0.0577
R^2	0.8336	
Number of observations	39	
Null-hypothesis: The remainder has a unit root (ADF examination)		0.0103

Panel B: Inventory of homes and demography	Dependent variable: Log(inventory_homes)	Probability
Log(population)	0.873	0
Population/households	-0.1393	0.0022
Fixed	0.3981	0.2304
R^2	0.9978	
Number of observations	39	
Null-hypothesis: The remainder has a unit root (ADF examination)		0.0001

The residuals from the estimation are shown in Figure 5. A negative residual implies a housing shortage relative to demographic needs, and in this case we would expect a relatively rapid increase in inventory and rising home prices. The figure shows that the residuals have been negative since 2009. This means that the actual inventory of homes is lower than what would be derived from the long-term relationship between the inventory of homes and demography. Compared with previous periods, the deviation appears to be relatively small, but it persists around the same level. A negative deviation creates upward pressure on home prices, which will encourage a more rapid pace of construction so that after a while the deviation will close, in line with the long-term relationship.

Figure 4
Asset Pricing Equation Remainder, 1980–2018
(percent (log points) of the long-term equilibrium price for given rent and interest)

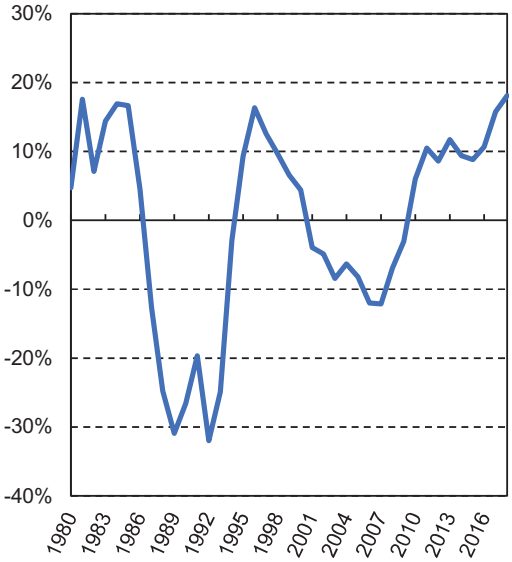
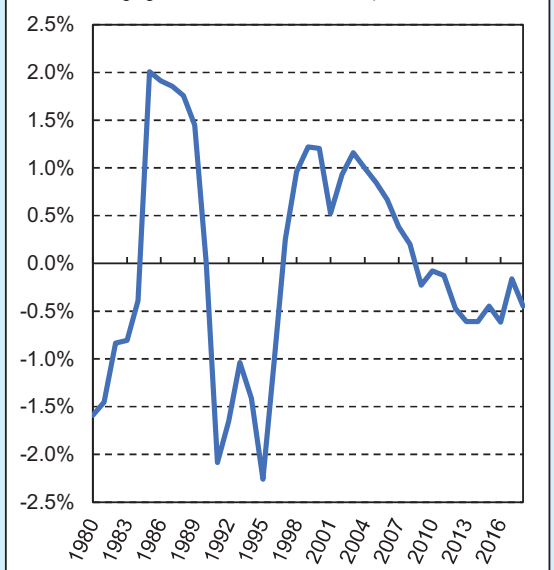


Figure 5
Stock-Demography Remainder, 1980–2018
(percent (log points) of the stock of homes, given the size of the population and households)



4. THE IMPACT ON PRICES

So far, we have presented the size of the deviations from the long-term relationships. To conclude, we will present estimations of the impact of these deviations on prices in the short term. Table 2 presents the estimations. As expected, the impact of the residuals from both regressions is negative. Specifically, over/under pricing of one percent in home prices results in a decrease/increase of 0.17 percent in the real price, and a surplus/shortage of dwellings equal to one percent of the inventory of homes results in a 4 percent decrease/increase in the following year.

Regarding 2018, we estimated over-pricing of 18.1 percent and a shortage equal to 0.45 percent of the inventory of homes (Table 2, and Figures 4 and 5). We therefore believe that the overpricing worked

to lower prices by 3.1 percent in 2019, while at the same time the housing shortage pushed prices up by 1.8 percent. In total (net), our assessment is that in 2019 the long-term factors pushed prices down by 1.2 percent in real terms. Nonetheless, price changes in 2019 were obviously also affected by other factors. It should also be emphasized that the over-pricing will be closed not only through falling prices, but also by way of an increase in rents, particularly in view of the estimated housing shortage compared with demographic requirements.

Table 2: Effect of deviations from the long-term connections on real home prices

Variable	Effect on prices in the next year	Remainder in 2018	Contribution to price changes in 2019
Remainder from the asset pricing equation	-0.17	18.10%	-3.10%
Remainder from the inventory of homes and demography equation	-3.97	-0.45%	1.80%