BANK OF ISRAEL

Financial Stability Report

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Financial Stability Report
for the Second Half of 2017

The Bank of Israel's Financial Stability Report is published twice a year. In the report, the Bank's economists assess the main risks to which the financial system is exposed, analyze potential stress scenarios, and examine the system's resilience to the risks and scenarios. The assessments and analyses are based on a review of historical developments, an examination of structural features, use of analytical models (including simulations and stress tests), and an assessment of updated background conditions in the global and domestic economies. The report presents the risks whose realization is liable to impact markedly on the economy in the short and medium terms, with the goal of increasing awareness of them among policy makers and the general public, and allowing appropriate preparations.

MAIN POINTS

- The global economy's process of improvement encompasses numerous countries, and in financial markets abroad there is stable development, with reduced volatility. As such, the level of short term risks originating abroad declined in comparison with their level in the previous review. Economic activity in Israel is robust, and is expected to receive support from an improved international environment. However, there is a risk that the global trend will reverse due to economic developments related to, among other things, the continued strength created in global financial markets against the background of accommodative monetary policy, and due to geopolitical uncertainty, even if it has decreased recently. As the Israeli economy is small and open, and is exposed to a great extent to global goods and services markets and financial markets, it—and the stability of its financial system—are exposed to a great extent to risks from the global environment.

- Interest rates worldwide are very low from a historical perspective, but in the US the interest rate path in the past year has been in a trend of increase, and in Europe the ECB's quantitative easing was reduced. The accommodative monetary policy adopted in recent years was intended to support economic growth and to deal with developments in inflation in Israel and abroad. The low interest rate lowered financing costs for the public sector, households, and businesses, and eased the servicing of the debt. However, in parallel, it adversely impacted on profits of pension funds and insurance companies.

- The continued low interest rate environment, which is conducive to economic growth and to normalizing inflation in Israel and abroad, acts to build up risks in the financial sector. This is seen in the increased appetite for risk and in search for yield. Low interest rates over an extended period of time can lead as well to non-optimal allocation of resources and can weigh on the balance sheets of households—the longer the period of time of low interest rates lasts, the greater the tendency of households and the business sector to increase their leverage. This development leads to enhanced exposure to risk in the economy, to the creation of additional exposures, and to an increase in the market's vulnerability to the materialization of stress scenarios.

- The economy's level of vulnerability—and as a result the level of stability of the financial system—depends on (a) the probability of the main risks materializing and (b) the strength of the exposure to them. The main risks that we identify include: reversal of the trend of real activity in the economy as a result of a demand shock from abroad or as a result of geopolitical events, a sharp and rapid decline in housing prices, a sharp change in the long-term interest rate curve worldwide, and a reversal of the trend in global financial markets. In our assessment, the probability of their materialization in the short term is medium or low.

- We continue to identify three main areas of exposure to risk in Israel's economy: the housing market, household leverage, and the asset market. The range of parameters examined in this report indicates that during the period examined in this report, the magnitude of the exposure to the housing and asset markets remained medium-high and the magnitude of the exposure to consumer credit remains medium.

- Interaction between the exposures to shocks can lead to materialization of the systemic risks and to an increase in the level of the economy's vulnerability. The developments in exposure to risk and in the assessment of the risks themselves indicate that in the second half of the year, the potential vulnerability of the economy remained medium.

- Against the background of the developments noted, the domestic financial system continued to maintain its stability. Among the factors contributing to its resilience are the macroprudential steps taken by the Bank of Israel, improved resilience and stability of the banking system, and the robustness of economic activity in Israel.

Introduction

Against the background of the periodic assessments (stress tests) of the financial system's resilience to various shocks, the Financial Stability Report focuses on the two main dimensions creating the range of risks in which the economy's financial and economic activities are conducted: 1) the main risks and their probability of materializing, and 2) the areas of exposure to risk and the magnitude of the exposure. The risks include trigger scenarios that have the potential to create disorder in the financial system and to act to diminish business activity. Generally it is not easy to identify them, and an estimate of the probability of their materialization relies mainly on subjective judgment. However, it may be assessed that the risks to a small and open economy, such as Israel's, stem to a considerable extent from exogenous sources and derive from developments abroad (including geopolitical events). Therefore even slight shocks in global markets or changes in expectations there are liable to lead to instability in the Israeli economy. The ramifications of such shocks are particularly significant in periods in which the economy is exposed to highly rated risks.[1]

The strength and magnitude of exposures are not fixed, and they can exist for a considerable period without the risks actually materializing. However, they determine the levels of the adverse impact and the turmoil in the financial system when business activity contracts and/or when the economy is exposed in actuality to significant shocks.[2] These factors are pro-cyclical and build up gradually in periods of low market volatility or they may develop as a result of prolonged structural deviations in the financial system. In contrast to the risks, the exposures (or areas of exposure) can be identified via models and economic parameters (economic and financial ratios), and it is possible to limit and regulate their magnitude via relevant regulation and close control of their path of development.

The two dimensions noted above, particularly the probability of the risks materializing and the magnitudes of the exposure to them, together fix the extent of the system's instability, and as a result—the level of the economy's vulnerability.

* * *

In this report we emphasize the changes that occurred in the two dimensions—and thus in the level of financial stability—relative to the findings of the June 2017 report.[3] Similar to the previous report, in the current one as well we identify three areas of exposure with the potential to have a marked macroprudential impact: 1) household debt; 2) the housing market—this area continues to be marked by imbalances; and 3) the asset markets (particularly the corporate bond market). These markets remain at price levels that do not internalize the risks. Alongside the exposures to risk, we note four main risks:[4] 1) the risk derived from a sharp change in long term interest rates worldwide; 2) the risk inherent in a sharp and rapid decline in housing prices against the background of how explosive this market is; 3) the risk derived from a reversal of the trend in real activity as a result of a shock from abroad or of a geopolitical risk; and 4) the risk inherent in a reversal of the trend in global financial markets. In addition, we examine the interconnectedness in the financial system as it is also an area/conduit of exposure to risk in the economy. We emphasize that while the main exposures are inherently cyclical, the interconnectedness is a structural channel of exposure at the economy level, and therefore the stability reports update the trends in its development at a lower frequency.

1 The magnitude of the exposure to risk during the review period is Medium—see Table 1.

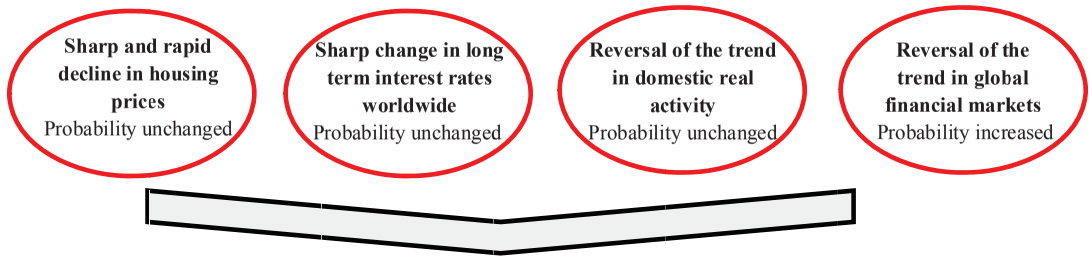
2 Regulators/decision makers strive to create capital buffers that are broad enough in periods in which areas of exposures and strengths accumulate, and to adopt stricter regulatory policy.

3 In this report we present the most recent data on the second half, not necessarily data as of the end of the half.

4 There are other risks in addition to these, such as the risk of a sharp reversal in the trend of inflation worldwide and risk related to changes in the business environment, regulation, and accelerated legislation in the financial system. However, in our assessment, the probability of these risks materializing is currently low.

Table 1
Pass-through of systemic risks to the economy

(a) The main risks and the change in their probability of materializing



(b) Main areas of risk, change in magnitude of the exposure, and channels of the exposure

Main areas of risk, by magnitude	Change in magnitude of the exposure over the past half-year	Channels of exposure to risk				
		Macro	***Markets***	***Credit***	***Liquidity***	***Interconnectedness***
Housing market	Unchanged	*	*	*		*
Asset markets	Unchanged	*	*		*	*
Household debt	Unchanged	*		*		*

Table 1 summarizes (a) the main risks and the change over the past half year in the probability of their realization and (b) areas of exposure to risk and the change that occurred in the magnitude of the exposure over the past half year against the background of the developments in the main channels of exposure.

Before reviewing the updated developments in the probability of the risks being realized and in the magnitude of the exposure to them, we emphasize that we continue to closely monitor the manner in which the continued low interest rate environment[5] impacts on the process of asset accumulation and on the enhancement of the exposure to risk in the Israeli economy. Macroeconomic developments created a necessity to adopt accommodative monetary policy, which supported real activity in recent years. Although the continued low interest rate environment acts to increase appetite for risk and to accumulate exposures to risk in the financial system in Israel (like in other markets worldwide). The pass through from the interest rate environment to increased magnitude of the risks in the economy goes through three channels: (a) Investors' activity in asset markets (financial markets and the housing market); (b) increased leverage of households due to a reduction in the cost of credit; and (c) the exposure of financial institutions to borrowers and activity segments with a high risk profile (such as real estate and construction, small and medium businesses, and consumer credit).[6] The low level of long term interest rates also impacts on the balance sheets and profitability of financial institutions (banks and insurance companies) and on their ability to generate capital and meet future obligations.[7] Although in the past the economy did display relatively high resilience to financial market fluctuations, the increase in leverage in the economy, the lengthening durations of loans (business and household), and the increase in liquidity risks (against the background of low market volatility)—are liable to expose the system to marked losses and to undermine the financial stability if the risks are realized.

Main economic risk scenarios

In this section we examine risk scenarios in Israel's financial system with the goal of identifying the main risks to it, not necessarily all the negative scenarios. This examination is based on two main components: (a) subjective assessment of the fundamental factors in the economy and economic background in which it operates; and (b) forecasts of economic developments in the short and medium terms.

Within the framework of the subjective analysis we identify four main risks to the economy's financial stability: 1) The risk that the trend of long term interest rates worldwide changes sharply; 2) the risk that housing prices decline rapidly and sharply against the background of the level of explosiveness in the housing market; 3) the risk that the trend in real activity will reverse as a result of a shock from abroad or from geopolitical events; and 4) the risk that the trend in global financial markets will reverse. We emphasize that most of the risks act via the same transmission components (demand, housing market, exchange rate, interest rates, etc.) and therefore they are highly correlated.

Sharp change in long term interest rates worldwide

If there is a sharp and prolonged change in interest rates worldwide, driven by an increase in the risk premium, and in parallel market liquidity contracts, it could lead to a deterioration (tightening) in financial conditions—that is,

5 Short term and long term interest rates are still historically low, and long-term interest rates (for all ranges) even declined in the second half of the year.

6 Financial institutions penetrating this activity segment is liable to adversely impact the distribution of risks in the system: if the borrowers' identity is relatively homogeneous (as in the case of small businesses) and they don't create advantages of scale or diversification, then dispersing investments by increasing the number of borrowers does not necessarily reduce the level of risk, as there is a high correlation between the risk profiles of the borrowers–households and small and micro businesses.

7 A report by ESRB (2016) surveys the manner in which a low interest rate environment is likely to impact on risks.

increased pressures in the system. This in turn can lead to an increase in demands for households and businesses to service the debt, and thus act to adversely impact the global growth process. Potential triggers for the realization of this risk include (a) markets' overreaction to a sharp (and greater than expected) change in monetary policy in advanced economies—a change that includes a rapid contraction of the purchase policies in the eurozone or Japan, or a sharp contraction in the Federal Reserve's balance sheet[8], and (b) renewed assessment of the credit risk worldwide in response to a deterioration in macroeconomic conditions or as a result of increased geopolitical tension.

As of the period reviewed, we continue to assess that there is a low probability of this risk being realized. As of now, the global growth rate continues to increase and the rise in the federal funds rate is relatively smooth (gradual and without surprises). As such, the probability of the scenario's materialization declined. In effect, it is more likely that the strong global growth will lead to a controlled increase in interest rates and to a gradual change in long term interest rates. Nonetheless, it should be remembered that there is evidence that the search for yield continues—risk premiums and credit spreads have reached historically low levels, and the extent of market volatility continues to increase—and this will strengthen the systemic effect if the risk reviewed actually materializes.

Sharp and rapid decline in housing prices

If home prices decline rapidly and sharply, households are liable to reduce current consumption, and contractors are liable to face bankruptcy and to lose the ability to service the existing debt. This would likely impact on overall economic activity. First, a sharp decline in home prices is liable to reduce households' willingness to utilize the equity that has accumulated. In addition, the LTV ratio of existing mortgage loans is expected to increase as a result of the decline in value of homes and the adjustment of prices to the new equilibrium, and households are expected to reduce consumption in order to deleverage as rapidly as possible. Second, a correction in home prices impacts directly and immediately on the scope of investments in construction and on expenditure on consumption of durable goods and housing services. A decline in housing prices also creates a negative wealth effect and impacts on the value of collaterals, which in turn directly impacts on private consumption and on financial institutions' balance sheets. This effect becomes stronger when the level of households' leverage is higher, and with the creation of the expectation that there will be a decline in the occupational/consumption security. A decline in housing prices also impacts on household balance sheets and contracts the supply of credit in the economy, so that it thus has macroprudential ramifications.[9]

With regard to the probability of the risk being realized in the short to medium term, we assess that it continues to be medium. The homes market continues to display the trend of stability created in recent months. The level of indicators of activity remains high and first time home buyers even increased the scope of transactions in April–June after having lowered it since the middle of 2016. However, total new-home transactions remain moderate relative to previous years (2013–16), and investors continue to reduce the scope of transactions. New mortgage volume also continues to show the downward trend that began in the past two years, though since May it has increased[10]—in line

[8] The Federal Reserve recently announced a prolonged process of reducing its balance sheet, and it is expected that the ECB as well will announce a consistent decrease in its monthly monetary expansion until it ends. Although the process in the US is expected to progress very slowly, the ECB is not rushing to announce a contraction, and the large quantitative easing in Japan is not expected to be changed soon, meaning we will see central banks continuing to contribute to increasing market liquidity in 2018 as well, though the signals they are sending are liable to serve as a springboard for reducing the risk taken by investors, mainly if one of the political risks also materializes. As financial asset prices are high, such a process is liable to adversely impact financial stability.

[9] We note that the financial system in Israel does not have exposures that would assist in turning the US price correction into the high unemployment rates seen in the 2007–09 crisis. In Israel, mortgage terms and borrowers' risk profile are sufficiently regulated; there aren't complex financial instruments backing up the loans, and Israeli banks have a broad base of financing sources (deposits) that enables them to supply mortgages; credit portfolios and credit lines are sufficiently diversified, and stress scenarios indicate that domestic banks have capital and liquidity buffers that are extensive enough to deal with corrections in housing prices.

[10] Seasonally adjusted data.

with an increase in scope of transactions by first time buyers and in accordance with the decline in mortgage interest rates that began in February 2017. These developments are in accordance with the possibility that the gap between housing needs and existing supply is contracting due to building starts having reached a high level in recent years. If there is an extended stagnation in the coming year (in the short term), it is likely that real estate companies will be forced to reduce prices. Highly leveraged companies with large inventory of unsold homes are liable to enter a downward cash flow spiral and credit crunch. However, there is another explanation for the developments, which includes some risk—potential buyers have shifted temporarily to a holding position against the background of the various steps taken by the government, including the "Buyer's Price" program, increase in purchase tax, and efforts to tax owners of three or more apartments. In such a scenario, potential buyers are likely to reenter the market and thus act toward renewed acceleration of the rate of price increases.

Reversal of the trend in domestic real activity as a result of a shock from abroad or a geopolitical event

In this scenario, a large and continued shock (geopolitical or economic) from abroad leads to a withdrawal from the process of growth in the domestic economy.[11] The decline in demand from abroad leads to a contraction in the scope of companies' investments, a decline in demand for labor, an increase in unemployment, and a negative impact on households' income. This, in turn, adversely impacts their ability to service accumulated debt, and as a result they sharply reduce private consumption, particularly if their leverage is especially high. These developments lead to a correction in home prices, which accelerates the spread of the shock and deepens the downturn. An increase in problematic credit, impaired debts, defaults, and a decline in the value of collaterals impact on the level of functionality of the lenders (financial institutions); it is expected that most of the losses would derive from consumer loans[12] and business loans due to the adverse impact on the value of collaterals. Such a shock leads to a marked contraction in credit supply in the economy and to an increase in the costs of raising funds (debt) among households and businesses, and thus strengthens the shock at the macro level. The risk is liable to strengthen further with the contraction of foreign investment in the economy.

We assess that as of the reviewed period, there is a low chance of this scenario occurring. However, if it does occur, it is expected to have a very extensive impact on system-wide stability. Although the macroeconomic robustness (due to the improved situation in areas of growth, employment, exports, wages, etc.) reduces the probability that this scenario will impact immediately on activity and adversely impact the financial system, however, the imbalance in the housing market and the increase in the level of household leverage increase it.

Reversal of trend in global financial markets

Despite the increase in the strength of global economic activity, there is still uncertainty with regard to economic and political developments, and thus there are still risks related to a reversal of the trend in global markets. Israel's economy is small and open—characterized by a broad scope of trade and a financial system that is considerably dependent on international financial markets—and is thus exposed to risks from the world. We assess that if the trend in global markets reverses, it will impact on Israel primarily through the financial markets, as the direct exposure of the economy and of Israeli financial institutions to focal points of risk worldwide is at a very low level.

The IMF[13] assesses that the immediate risks to global financial stability continued to decline in the period reviewed, mainly because global growth improved—a development seen both in advanced economies and in developing economies. However, the IMF emphasized that the medium term risks continue to accumulate and apparently will

[11] A marked economic deterioration among countries that are Israel's export destinations is expected to reduce demand for Israeli exports.

[12] The housing credit channel is supervised in Israel.

[13] Global Financial Stability Report, October 2017.

continue to increase, as there is a gap between the stage where markets are in the economic cycle (slow growth and low inflation) and the stage where they are in the financial cycle (high asset prices); therefore, it is very difficult to find the correct pace at which to end the extremely accommodative monetary policy, and it must be done very carefully in order to continue to support growth and the inflation target while in parallel prevent excessive risk taking. Against the background of the extremely accommodative monetary policy and the risk taking it encourages, the rises continue in financial asset prices and in nonfinancial companies' leverage—which makes them vulnerable to a scenario in which yields rise and spreads widen—and these increases continue to create risk and to challenge decision makers.

In our assessment, the main risk derives from the political situation in the world becoming increasingly fragile due to the increase in tension points. Although the high liquidity in markets markedly moderates their reaction to events and as noted serves to treat immediate risks, it allows risks and imbalances to accumulate. If political risk materializes, it is liable to strengthen market declines and bring the markets to levels that can create prudential risk. As of the period reviewed, it appears that the political risk from Europe continues to decline; this development began in the previous period and strengthened in the current period—Europe is easily getting past the challenging election campaigns and events that incorporate risk, and it appears that it is not a source of immediate risk. In contrast, the political risk from the US continues to increase and it appears that it is dealing with numerous challenges both externally and internally—in the international area there is tension with North Korea (war), China (trade war), and Russia (both of the above), and internally it is dealing with the debt ceiling, government shutdown, unusually severe tension[14] between Republicans and Democrats, and more.

The other risks—including the geopolitical risk and the risk deriving from the weakness of the banking system in Europe—remained virtually unchanged, though they still exist and are liable to materialize as a result of an external trigger such as political shock. This is indicated by the lowering of Deutsche Bank's rating and because the IMF determined that a third of systemically important banks have not yet succeeded in aligning their business model with the changing reality and therefore are not sufficiently stable.

The main exposures to risk (main areas of exposure)

In this section we present the main areas of exposure to risk in the Israeli economy. The exposures to risk define the vulnerable areas of the economy and serve as a factor that increases the potential shocks (main economic risk scenarios) when they materialize. The range of parameters examined in this report indicates that:

- **The housing market continues to create the strongest main exposure to risk**. The imbalances in the housing market are a central factor in macroeconomic and financial vulnerability. To illustrate, when housing prices deviate from prices based on fundamentals, the probability of a sharp correction in them increases. Such a correction is liable to develop into a threat to the economy's financial stability, as the banks and financial institutions are directly exposed both to households and to contractors' activity via supplying the demand for credit[15], and because there is a correlation between the value of the collaterals they hold and the developments in the housing market.

Recently, uncertainty has developed with regard to the continued activity in the housing market and with regard to trends in demand, and there has been a slowdown in the rate of expansion of supply. These processes lead to imbalances in the housing market and thus increase the system's sensitivity to possible changes in home prices and

[14] It is without precedent in the past several decades.

[15] Banks' exposure to mortgages and to the construction and real estate industry increased this year to about 45 percent. Most of the increase derives from an increase in housing credit.

increase its financial vulnerability—particularly against the background of the prolonged increase seen in debt levels of households and the business sector, especially among firms in the construction industry. Home prices continued to increase in the period reviewed—although their rate of increase declined[16] as investors reduced their share in new transactions and mortgage volume decreased—and the gap between the home price index and the housing index widened, a development that points to relatively high explosiveness in that market. The increase in prices deriving from various sources[17] does not exclude the possibility of price declines—the factors working toward an increase can change, especially if they are outside the long term equilibrium. To illustrate, if interest rate rise sharply, it will impact on the housing market directly—by impacting asset values and on the capitalization factor, and indirectly—by raising the cost of financing and the cost of servicing the debt. This is a troublesome development, particularly if households' expectations are not in line with the interest rate path in the long term and if they do not have wide enough security buffers when buying homes (when the transaction is executed). In this regard, we note that the home price to income ratio increased and households were forced to increase their down payment on home purchases and/or to increase the scope of external funds (mortgage), and this is in a period in which mortgage interest rates stabilized at a relatively high level. However, the macroprudential measures that the Banking Supervision Department adopted in recent years, alongside the close oversight in the housing market, continue to act to regulate the extent of the exposure to risk in this area.

In this regard, it should be noted that the pace of expansion of supply declined because demand was split into two separate markets—the "free" market and the market of those eligible for the "Buyer's Price" program. In the free market, the risk for contractors continues to rise due to a reduction in the allocation of new land for construction and due to the stock of unsold homes. The gains accrued in previous periods and the inexpensive financing (mainly from the nonbank sector) enable contractors to service the existing debt (bank debt and corporate bonds) and provide a response to the low equity and the costs involved in holding existing inventory.[18] The market of those eligible for the "Buyer's Price" program includes households that are waiting to realize the eligibility for a subsidized asset. It is reasonable to assume that additional demand flowed to the market due to the program, which is doubtful that would have been created under regular conditions (in the existing price dynamics in the housing market). This demand increases households' future leverage, and upon signing the contract it causes them to convert liquid capital (their own equity) into an illiquid asset (the right to a home)—which is reflected in the contraction of households' security buffers and in potential exposure to risk. This exposure depends on uncertainty regarding numerous components, including future credit prices[19] (the cost of the mortgage), home prices, and the waiting period for realizing the asset (the period of time in which it is prohibited to sell the home).[20]

- **Households' leverage continues to create one of the exposures to risk. The magnitude of the exposure remained medium over the course of the half year**. The financial status of households in Israel remained stable

[16] Home prices in Israel increased by about 116 percent between December 2007 and November 2016. In 2017 they continued to increase though slower (between January and August they increased by 5.4 percent in annual terms, while they increased by 6 percent in 2016 and by 8 percent in 2015).

[17] Several reasons can be seen for the marked rise in home prices: structural factors acted to create a shortage in supply of homes; real wages increased and taxes decreased, which increased households' income and wealth level; the low interest rate in recent years, which reduced households' financing costs and increased the demand for housing as an asset while increasing the level of leverage.

[18] More than 70 real estate companies raised debt on the TASE since the beginning of the year.

[19] Already today, eligible people are forced to mortgages at relatively high prices compared with prices in previous periods.

[20] Due to a lack of relevant data (the amount of the subsidy by geographic region, the share of actual transactions/cancellations, and an analysis of the financial robustness of those deemed eligible in the program), it is not currently possible to comprehensively analyze the magnitude of exposure to risks, but it appears that it depends on households' risk profile, meaning future earnings capacity, occupational security and the extent of the consumer debt to which they are exposed before and after the decision to take on leverage in order to purchase a home.

in the second half of 2017, and the ratio of households' outstanding debt to GDP is 42 percent[21], low compared to the debt level measured in other advanced economies. However, in recent years the ratio has been on an upward trend, and household debt is growing slightly faster than wages (disposable income). Household debt and access to credit increase demand in the economy (via private consumption), create a wealth effect, improve the welfare of households, and make it possible to smooth consumption over time. In contrast, the high leverage exposes the financial system to risks and fluctuations in the medium term, particularly in advanced economies. For example, the last financial crisis showed that the high indebtedness of households created vulnerability in the financial system and contributed considerably to the lengthening of the low period.[22] The high debt level is likely to lead to a sharp adjustment of consumption during a shock—through deleveraging—and thus impact on broad parts of the economy. Based on an IMF analysis (GFSR 2017), the indebtedness of households begins to create a negative effect on the economy (begins to have macroprudential ramifications) when it reaches approximately 30 percent.[23] In countries with a relatively low debt to GDP ratio, rapid expansion of the debt component (as is occurring in Israel) leads to an increase in the share of leveraged households with a relatively low resilience to shocks.

When dividing the household debt balance in Israel into housing debt and consumer (nonhousing) debt, we see that the trends noted in previous reports are continuing—housing credit (mortgages) continues to expand, even if at a more moderate pace than in the past, due to the developments in the demand side and due to the continued increase in housing prices; the rate of expansion of consumer credit is moderating, at 3.1 percent from the beginning of the year.[24] In contrast to housing credit—a supervised sector where various indicators (PTI, LTV, term to maturity) show that it contains a reasonable exposure to risk—nonhousing credit is managed mainly in accordance with the risk appetite policy and risk assessment models of financial institutions. The insolvency proceedings in this sector are going through a process of legislation[25], and the unsecured credit component continues to grow. Banks continue to supply most of the nonhousing credit, though in recent years financial institutions, particularly credit card companies, have expanded their scope of activity and increased credit supply in this sector.[26] The (reported) consumer credit makes up about a third of total household credit, the (average) price of consumer credit remains high relative to credit to micro and small companies[27], the term to final payment has lengthened, and households' interest payments and arrears in servicing debt (loan loss provisions at financial institutions) continue to increase. This increases the vulnerability to a potential shock to household income.[28] The rise in disposable income, against the background of macro conditions in the economy, still serves as an advantage and improves households' ability to service the debt in current conditions. However the increase in debt raises their sensitivity to changes in the fundamental conditions—

[21] Based on the IMF analysis, the median value of the ratio of household debt to GDP increased in advanced economies from 52 percent in 2008 to 63 percent in 2016.

[22] Mian and Sufi (2015). "Household Debt and Business Cycles Worldwide", NBER, no. w21581.

[23] In contrast research by the Bank for International Settlements (BIS) indicates that the threshold is 70 percent. See M. Lombardi (2017). "The Real Effects of Households' Debt in the Short and Long Run".

[24] However, it expanded by 6 percent in 2016 and by 5.6 percent in 2015.

[25] In recent years, legislation has changed in favor of insolvent parties, which has led banks to increase their allowances for problematic credit.

[26] In addition, in recent years nonbank institutions have developed here, and thus it is plausible that the nonhousing debt balance is higher than the reported balance.

[27] The average interest rate on consumer loans is impacted by their composition. To illustrate, loans secured by a pledge, such as auto purchase loans, have relatively low interest rates.

[28] We note that from a historic perspective, when there is an increase in the inability to service the (bank) debt and nonbank debt that is not for housing, and this occurs against the background of low unemployment and a good financial situation among households, it indicates that the economy is near the apex of the business cycle.

when breaking down credit into housing credit and consumer credit and examining them by age, it is found that the younger age cohorts continue to bear most of the debt in the economy (see the Financial Stability Report from June 2016). These age groups naturally have few savings (generally the only asset they own is a home) and thus their security buffers are relatively small. Furthermore, the long term survey (as of 2015) indicates that the intermediate deciles (the 7th and 8th income deciles) are responsible for a notable portion of the debt (both housing debt and nonhousing debt). Based on the income and expenditures survey, this group has relatively small savings rates, that is, they have few liquid assets for dealing with unexpected economic shocks. An increase in unemployment or decline in home prices (a decline reflected in a decrease in households' equity) is liable to reduce private consumption in the economy and increase the probability of bankruptcy among households. (For an expanded discussion on the macroeconomic effects of the increase in consumer credit, see Box 4.1 in the Bank of Israel Annual Report for 2015.) During a shock to economic activity, households will be forced to service housing debt before consumer loans, and it is reasonable to assume that they will prefer to do so instead of realizing the physical assets. In such as case, the supply of credit in the economy is likely to contract.

- **The asset market continues to be a channel of exposure to risks. The magnitude of the exposure to it remains medium**. The low interest rate leads to an increase in asset prices due to the search for yield and increased appetite for risk. The lengthening of the trend of strengthening these processes is of macroprudential importance. In the past year, the equities market began to pick up—the small cap index, which does not include large pharmaceutical companies, increased sharply, and there were increases in new issues and a flow of funds to equity mutual funds. Nonetheless, financial ratios—such as the P/E ratios (cyclically adjusted[29]) and the ratio of total market cap to GDP—do not show that prices are deviating from fundamental factors. In contrast, the public remains significantly exposed to corporate bond prices as they are sensitive to changes in interest rates, and this exposure even grew slightly in 2017 due to direct asset holdings[30] and due to indirect holdings, through savings with institutional investors. A future increase in the interest rate or other shock is likely to lead to a decline in the prices of corporate bonds and to adversely impact the public's savings. The risk inherent in a sharp reversal of the trend is strengthening in view of mutual funds' having significant balances of corporate bonds, as past experience has shown that at times of crisis, households, with savings though them, tend to rapidly withdraw their savings and thus increase the volatility in the market in a manner that can strengthen the shock.[31]

As the corporate bond market continues to reflect low spreads, questions arise regarding underpricing of the risks inherent in the activity of the issuing companies. The data indicate that profitability and activity levels remain high in the business sector, companies are enjoying financial stability, the probability of default (measured by EDF) is low in all industries, market volatility declined, and the high liquidity makes it possible to roll over debt quite easily. However, in contrast, spreads remain historically low (the levels are similar to those seen in 2007), and in parallel there is an increasing scope of bond issues and net debt raised (primarily among real estate companies, especially foreign ones), even if in recent months there have been net withdrawals from bond mutual funds. In addition, there are low spreads at low rated bonds. Contributing to the low spreads in the high liquidity in the markets in recent years, as a result of the accommodative monetary policy, and if it dries up rapidly (for example, due to an increase in perceived risk or a deterioration in economic conditions), it is liable to lead to a rapid increase in spreads and financial difficulties for companies.

[29] CAPE-Shiller.

[30] Approximately 20 percent of the public's assets portfolio is invested directly in bonds in Israel.

[31] In August 2017, mutual funds held 26.35 percent of the tradable corporate bond balance while in the corresponding period in the previous year they held 22.2 percent. This is a continuation of the trend of increase that began in 2009.

- **The interconnectedness in the financial system serves as a structural channel of exposure to risk, and is at a medium level in the Israeli economy as well**. Similar to leverage and to maturity transformation, interconnectedness incorporates the potential to create external influences, whether through mutual exposure between financial institutions or through shadow banking (a channel that increases the complexity of the financial intermediation chain and therefore interconnectedness). The interconnectedness in the financial system works to disperse risks when the shocks observed are relatively weak. However, when the shocks are sufficiently strong, excessive interconnectedness increases the probability of the risks becoming systemic ones due to the strength of the direct exposures, and the potential for fire sales and contagion.[32] For this reason, interconnectedness is listed among the factors at the focus of assessing systemic risk to the financial system, and is also given great weight by international institutions, including the IMF, the BIS, and the Financial Stability Board (FSB).

Financial institutions (banks, institutional investors, etc.) are exposed to each other directly and indirectly. They are exposed directly due to bilateral transactions, which are mutual obligations, and to the extent that this exposure grows, so does the probability that a shock will move from one institution to another. In this regard we note that the financial system in Israel is relatively concentrated (it has a small number of "core" institutions), which provides a convenient infrastructure for strengthening shocks and for contagion. While the extent of direct exposures in it today is low from a historical perspective, its trend is not uniform: the increase in institutional investors' investments in banks increases it, but in contrast it is small due to a decline in banks' exposure to other banks, insurance companies, and to institutional investors. (This is based on the share of banks' holdings of institutional investors' securities.) The banking system's exposure to financial institutions abroad also decreased.

As noted, the financial institutions are also exposed to each other indirectly, via exposure to the same third party or to a common asset. If the common entity/asset is impaired due to a specific shock, then a fire sale at the institutions related to it can reduce the value of their assets and cause losses, either through a decline in the value of the assets exposed to the common impaired asset or through a decline in the value of the unimpaired common assets (as they are realized in order to cover the losses in respect of the impaired assets). In contrast to the direct exposure, the indirect exposure increased in recent years both in Israel and abroad. The indirect exposure in Israel has increased as the banks are increasingly carrying out syndication transactions, as the banks sell more credit risks/portfolios to institutional investors, and due to overlapping of large credit exposures (an expanded discussion appears in Box 2).

[32] This does not mean to say that interconnectedness is necessarily bad for the system. Transactions between financial institutions allow them to reduce financial risk transfer. However, from the perspective of financial stability, high interconnectedness increases the probability that shocks will spread rapidly and gain strength, and therefore it is considered as one of the main features of the rapidity and strength of contagion. In interconnected systems, there are increased chances of seeing a combined failure of several financial institutions. Interconnectedness can also lead to rapid transmission of shocks from cyber attacks (for an expanded discussion, see the Financial Stability Report for 2016:H1).

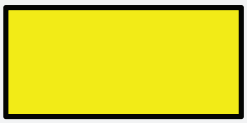
Financial Stability Monitor

To assess the magnitude of exposures in the economy, and to point to the changes that occurred in it between the two halves of the year, we use a monitor that examines the channels of exposure to risk. The monitor serves policy makers in assessing the stability of the financial system and in supervising it. Along with an analysis by main component, there are quantitative assessments and resilience tests, such as stress tests, and macroprudential monitoring. The monitor continues to develop in accordance with the quality of its yields (its forecasting ability), an analysis of new indicators, and statistical data and tools. The Financial Stability Division at the Bank of Israel updates the monitor every half year in order to illustrate the changes in risks to the financial system and its vulnerability.

Main channels of exposure	Emphases	Period
Credit and Markets	Credit	2017:2

The general risk to the stability of the financial system in Israel remains, in our assessment, at Medium. The assessment of the magnitude of the exposure to risk in the economy is based on the magnitude of the exposure to five main risk channels: macro, markets, credit, liquidity, and interconnectedness (potential for contagion). Their heat map (below) makes it possible to follow the development of the strength of the exposures and the change in it relative to the previous period.[33] The monitor is not intended to forecast the timing of a financial shock to the economy or to assess its strength, but rather to identify its main areas of vulnerability.

[33] The monitoring is of course carried out based on available data.

Period/Channels of exposure	2017:H1	2017:H2
Macro		
Asset markets		
Credit		
Liquidity		
Interconnectedness		

Heat map of the risks: The risks are presented by their severity, from lowest (dark green) to highest (dark red)

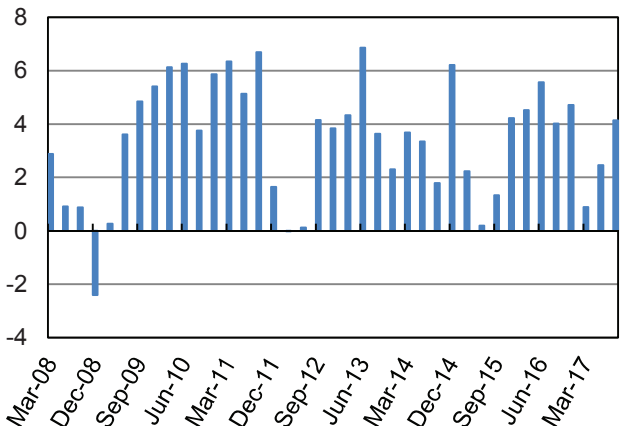
Macro

	2017:1	2017:2
International environment		
Real activity		
Inflation		
Country risk (risk premium, credit rating)		

In the period reviewed, the economy was at full employment with high occupational security, the risks of inflation breaking out were low, activity was high, the composition of growth is oriented toward private consumption (current consumption), and a decline can be seen in the immediate risks to global financial stability. In contrast, developments in the global environment, particularly financial markets, indicate that the magnitude of the exposure to medium-range risks to financial stability and real activity has increased.

National Accounts data for the third quarter of 2017 indicate that the economy continues to grow at a pace consistent with its potential growth, and the composition of growth is returning to being private consumption oriented. Based on various assessments, the current growth rate reflects an economy operating at full employment, with supply constraints among some production inputs. According to the first estimate of third-quarter National Accounts data, GDP grew by 4.1 percent (and business sector product grew by 4.2 percent) (Figure 1). Although this is a more rapid pace than that of the first half of 2017, it reflects considerable volatility (mainly due to fluctuations in vehicle imports). The average growth rate in the past four quarters is approximately 3 percent, similar to the potential growth rate. Various indices—the Companies Survey for the third quarter, the Composite State of the Economy Index in July–August, and the Purchasing Managers Index—point to the GDP growth rate being in line with the long term rate.

Figure 1
GDP Growth Rate[a], March 2008 to July 2017
(percent)



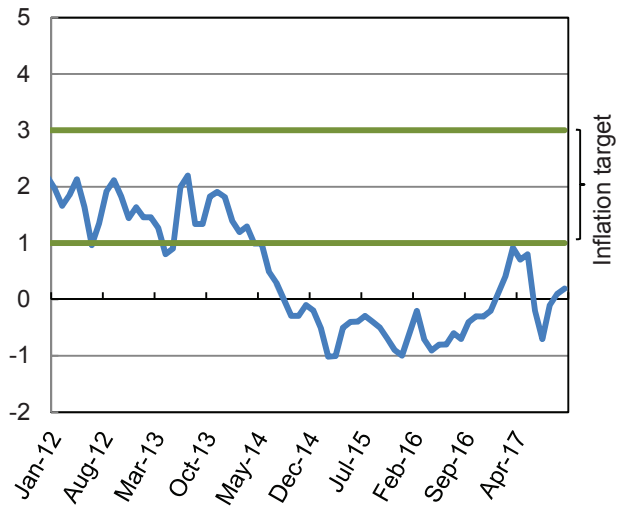
[a] The quarterly rate in annual terms, seasonally adjusted at fixed prices.
SOURCE: Bank of Israel calculations.

The labor market continues with high levels of activity, in line with the full-employment environment. The unemployment rate remained low, and there was a high and stable participation rate. The Companies Survey indicates a shortage of labor in all industries in the economy, but despite this there is no evidence of significant wage pressures: the nominal wage in the business sector has increased at a stable rate since the beginning of the year (February–August), and the unit labor cost continued to increase during the review period at only a moderate pace. This development is in line with the economy's stage in the business cycle and indicates that it is approaching full utilization of production inputs.

The increase in wages (costs of manufacturing inputs) is not currently reflected in goods prices, as corporate profits

and return on equity remain high.[34] It appears that the potential for inflationary pressures as a result of the wage increase is on the demand side—due to the increase in the public's buying power—and not on the supply side. The inflation rate remains below the target (Figure 2), and there was no major change in expectations. Low annual inflation is a feature of all CPI components, including nontradable goods. It appears that on the supply side there are factors that continue to moderate inflation, such as exchange-rate developments and structural developments, including government interventions and enhanced competition[35], a process that contributes to a decrease in the monopolistic power in some industries. As of the end of the period reviewed, the inflation rate prevailing in Israel is the lowest in the OECD.

Figure 2
Inflation Over the Past 12 Months, January 2012 to October 2017 (percent)



SOURCE: Bank of Israel.

As inflation has been low for an extended period, it is reasonable to assess that there are long-term background conditions, and therefore it is reasonable to assess that it will return to the target range gradually. Accordingly, inflation expectations for the 12 months ahead (according to private forecasters, the capital market, and the Bank of Israel) remained low and near the lower bound (1 percent) of the target range. Monetary policy is expected to remain accommodative with the goal of entrenching the inflation environment within the target range.

Data on activity during the period reviewed indicate that the positive momentum in the global economy is continuing. In accordance with previous forecasts, world trade continues to expand, led by developing economies, and leading indicators remain high. In the second half of the year, the IMF revised upward its global growth forecast for 2017, to 3.6 percent, and for 2018, to 3.7 percent. The forecast for US growth was revised downward[36], while forecasts for growth in the eurozone, China[37], and Japan, as well as for emerging markets, were revised upward. The improvement in background conditions worldwide reduces the probability of a negative shock from abroad on the demand side. Based on Israel's National Accounts data, total exports (excluding startups and diamonds) have been on an upward trend[38] in the reviewed period as well, driven by services exports.

Global inflation remained moderate and below central banks' targets, and interest rates remained unchanged, among other reasons in order to continue supporting real activity. Long term interest rates increased slightly during the first half, and the balance sheets of banks and insurance companies improved due to an increase in capital and liquidity buffers, and these processes contributed to an increase in profitability of banks and insurance companies, and to

34 This derived partly from Israel's risk premium declining this year as well.

35 As a result of a change in consumers' behavior and as a result of regulation in the markets.

36 Risks are still biased to the downside, with the main ones being: political uncertainty, foreign policy, economic reforms, protectionism in advanced economies, and the handling of the "fiscal cliff" in the US.

37 China's main challenge is reducing leverage and enhancing supervision of shadow banks.

38 With that, the continuation of the real appreciation moderates Israeli exports.

improvement in the resilience of financial institutions worldwide.[39] In contrast, the main risks began to shift from the banking sector to the markets and the business sector, and the accommodative monetary policy continued to act to increase the search for yield in markets, and to an increase in the appetite for risk.[40] This was reflected in an increase in the debt level and in the creation of distortions in asset markets.

Equity markets worldwide continued to rise in the reviewed period—a trend that is supported by the improvement in world trade and growth, and by the marked improvement in corporate profits. At the same time, earnings multiples on the leading indices (such as the S&P 500) are at their highest level since the beginning of the previous decade, and the risk premium in stock markets remains low.

Bond market spreads continue to decline (while companies' leverage, particularly in the US, is rising markedly), and the flow of funds to developing markets has gained strength since the beginning of the year (after a negative trend in 2016). Long-term government bond yields declined in the period reviewed and remained historically low, against the background of advanced economies continuing to adopt accommodative monetary policy. The spread between yields on Israeli government bonds and US government bonds remained negative, and widened. Israel's CDS level reached its lowest level in more than a decade, and this decline in risk was reflected in rating-company Fitch's confirming Israel's A+ credit rating. The decline in risk occurred against the background of the surplus in the balance of payments, the structural robustness and the strong macroeconomic results, and despite political and security risks and the ratio of government debt to GDP remaining high relative to reference countries. Despite the geopolitical risks and the political uncertainty in several focal points worldwide, indices of volatility (in the short term) and uncertainty, such as the VIX (Figure 3) and the MOVE index, remained quite low. However, their development indicates that investors expect that volatility will return to its historic level in the coming year.

The correlation between the domestic capital market and most markets worldwide remains high, though the extent to which Israel's financial market is directly exposed[41] to activity abroad (via the banking channel) declined in the period reviewed: total balance sheet exposure of the five banking groups to foreign countries totaled NIS 154 billion in June 2017 (10.5 percent of total assets), while in December 2016 it was NIS 167 billion (11.4 percent of total assets).

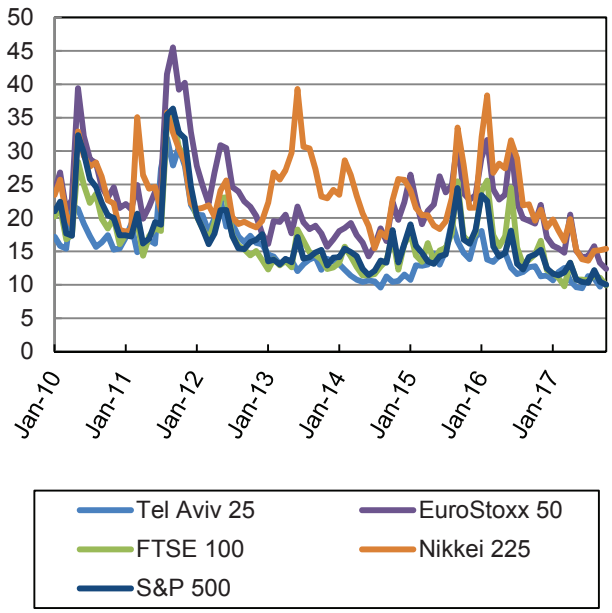
Most of the reduction in exposure derives from decreasing exposure to the US, impacted by the appreciation in the period reviewed. Approximately half of banks' exposures to foreign countries derives from exposure to the US, and about one-quarter is from exposure to European countries (Figure 4). The total balance-sheet exposure of the five banking groups to foreign financial institutions stayed diminished at NIS 48 billion (3.3 percent of total assets). The exposure is focused on foreign financial institutions rated A- and higher (94 percent).

[39] Based on the IMF analysis, European banks with systemic insurance continued to improve their balance sheets during the reviewed period, however, about a third of them still do not present satisfactory profitability and suffer from an impaired business model.

[40] As of today, the debt level of the (nonfinancial) business sector in the G-20 economies is higher than its level before the last financial crisis.

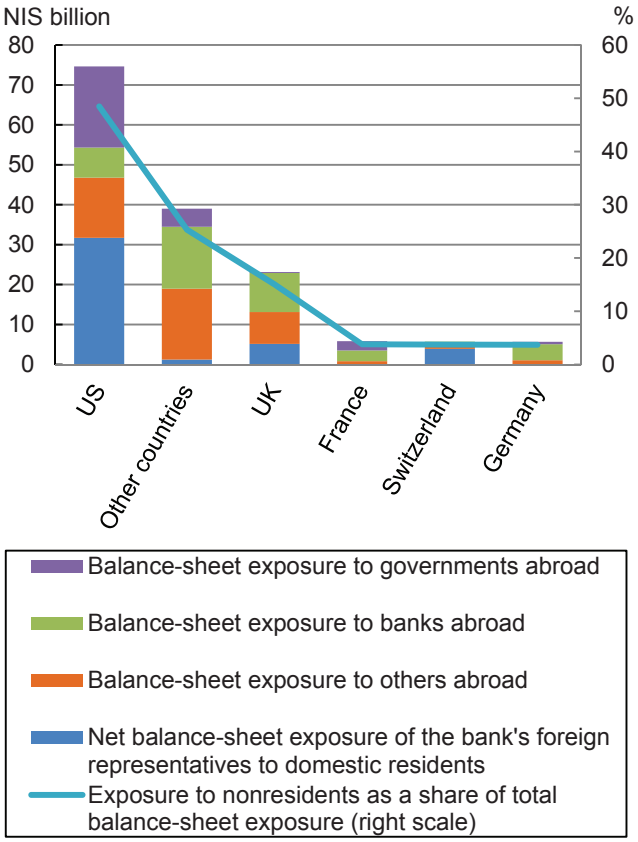
[41] The economy's total exposure to activity abroad passes through various channels: investments by the public and by institutional investors in financial assets abroad, dual-listed companies, exports, and the balance sheets and scopes of activity of Israeli companies abroad (such as East European real estate and factories in Europe).

Figure 3
Implied Volatility[a] Derived from Options on the Equity Indices in Various Countries (VIX), Monthly Average, January 2010 to October 2017
(percent)



[a] Indices in local currency terms.
SOURCE: Bank of Israel calculations.

Figure 4
Banks' Balance-Sheet Exposure to Foreign Countries, September 2017



SOURCE: Banking Supervision Department.

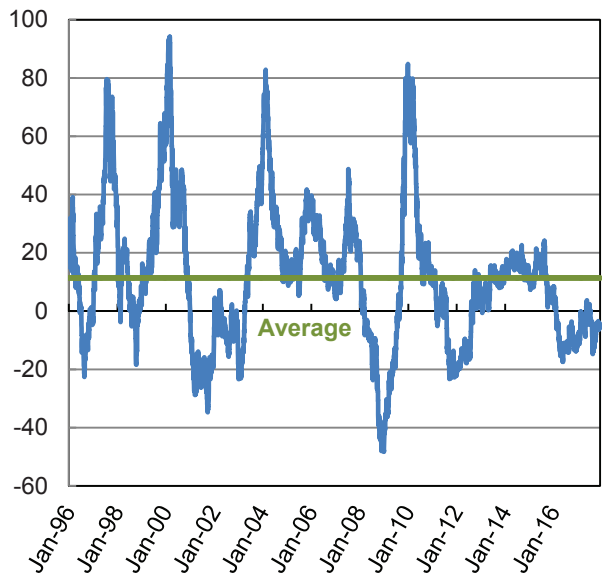
Asset markets

Volatility	2017:1	2017:2
Interest rate risk		
Asset pricing (equities, bonds, housing)		
The assessment: financial institutions' positioning		

Developments in the markets continue to indicate medium exposure to risk. In the housing market, and particularly in the corporate bond market, there are signs of undervaluing the risks and overpricing of assets. The equities market continues its trend of picking up against the background of low volatility, and the risks in it are average over the long term. Financial institutions are still considerably exposed to corporate bonds.

The equities market: In the period reviewed, the trends of Israel's stock market indices were different than on global indices, with prices mostly lower. The trend was led by pharmaceutical companies that traded sharply lower due to weak financial statements and lowered forecasts for the remainder of the year. For the overall period (as of September), the TA-35 Index declined by approximately 2 percent[42], after declining by about 10 percent in the previous year and after having increased over the preceding 4 consecutive years. In contrast, the TA-90 Index increased by about 21 percent this year, impacted by real estate shares continuing to benefit from the economy's low interest rate and by dual traded stocks that trade in the US as well. The domestic market's volatility indices (VIX and the broad risk index) were in line with the global trends and reached the lowest level observed in some time.

Figure 5
General Equities Index in the Past 12 months, January 1996 to November 2017 (percent)



SOURCE: Tel Aviv Stock Exchange.

Although the pace of equity issuances increased markedly relatively to that of previous years[43] (in the second half, companies issued NIS 4.34 billion in equities and from the beginning of the year they issued about NIS 8 billion—compared with NIS 5.3 billion in 2016 and NIS 5.17 billion in 2015), the ratio of scope of stock market issues to the scope of total issues (debt and equity) is slightly higher than the long term average.

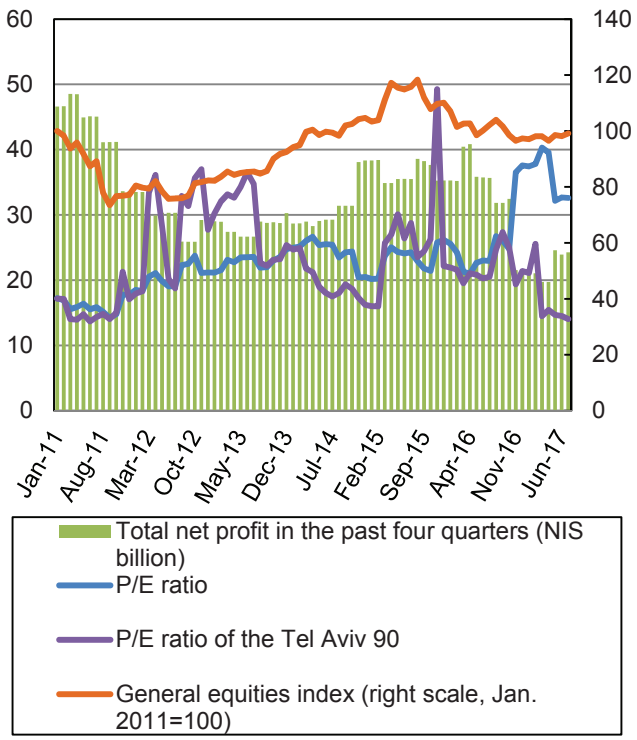
[42] On February 9, 2017, a reform in stock market indices went into effect. Within its framework, the maximum share of large cap stocks in the TA 35 Index declined from 10 percent to about 7 percent. The reform created a more balanced index, and therefore the sharp price declines in shares of pharmaceutical companies had a relatively moderate effect.

[43] Contributing to the sharp increase this year was the wave of IPOs: 14 new companies—more than the number of new companies in the past 4 years combined—raised approximately NIS 2.8 billion. Real estate companies continued to stand out this year as well: they raised approximately 30 percent of the amount raised on the stock market, though last year they raised about 40 percent.

Although in the past 12 months the growth rate of stock prices (measured by the General Shares Index) increased, it is lower than the average since 1995, and does not reflect atypical development of prices (Figure 5). This conclusion is supported as well by various earnings multiples and the ratio of companies' market value to GDP[44] (Figure 6).

The bond market: During the period reviewed, bond prices continued to rise, and most corporate bond indices have increased since the beginning of the year, by up to 5.5 percent (Figure 8). The average spread for the business sector rose to about 2.82 percent (after being 2.76 percent in the first half), but it is still very low and similar to that seen at the end of 2007. A breakdown by industry (Figure 7) indicates that spreads increased slightly in trade and services, an industry in which strengthening competition is affecting price levels and corporate profitability; spreads also increased slightly in construction and real estate, an industry that was impacted by the many steps taken by the government to cool off the housing market. In contrast, spreads decreased in the manufacturing industry (and in the oil and gas exploration industry).

Figure 6
Net P/E Ratio of All Companies Traded on the Stock Exchange, General Equities Index, and Company Profits, January 2011 to July 2017



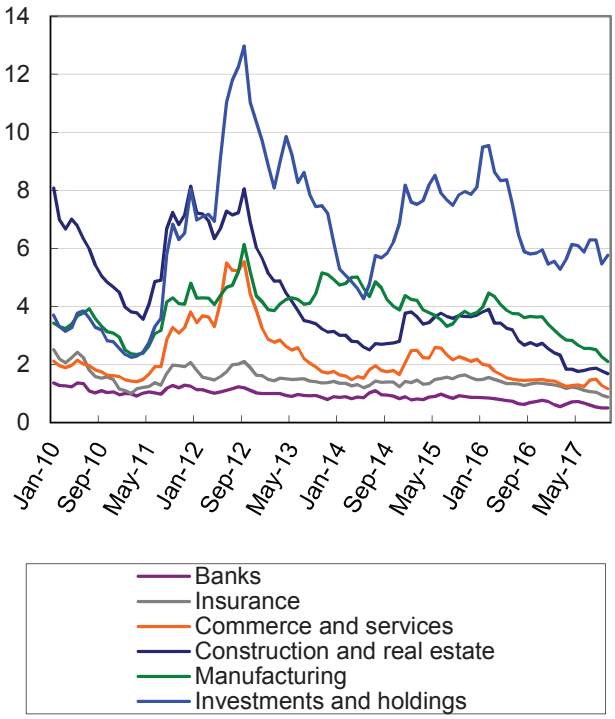
SOURCE: Based on Tel Aviv Stock Exchange.

The low spreads cut across industries (except holding and investment companies) and ratings (Figure 9), but it is worth focusing on the bond spread for BBB rated securities, which over the course of the year reached its lowest level since the inception of that rating. Even though spreads in this category rose slightly in the second half of the year, there is still a small difference between spreads on BBB rated bonds and the spreads on A rated bonds. Against the background of the reduced gap between spreads on A rated bonds and spreads on AA rated bonds, it appears that corporate bond market spreads partly reflect the separation between levels of the risk premium at various ratings.

However, the increase in the average spread, as well as the increase in bond spreads at low ratings (relative to similar securities worldwide, as well), may indicate that corporate bond market investors in Israel are internalizing the risks. Support for this claim can be found in pricing of foreign corporate bonds issued in Israel: despite the increase in the scope of the economy's exposure to them (particularly in the real estate industry), it appears that as opposed to the past, they are priced in accordance with their implied risk. This is because of the continued gap in the spreads between foreign corporate bonds and similar Israeli bonds in the same rating group, ad it likely reflects compensation for the greater risk in foreign bonds.

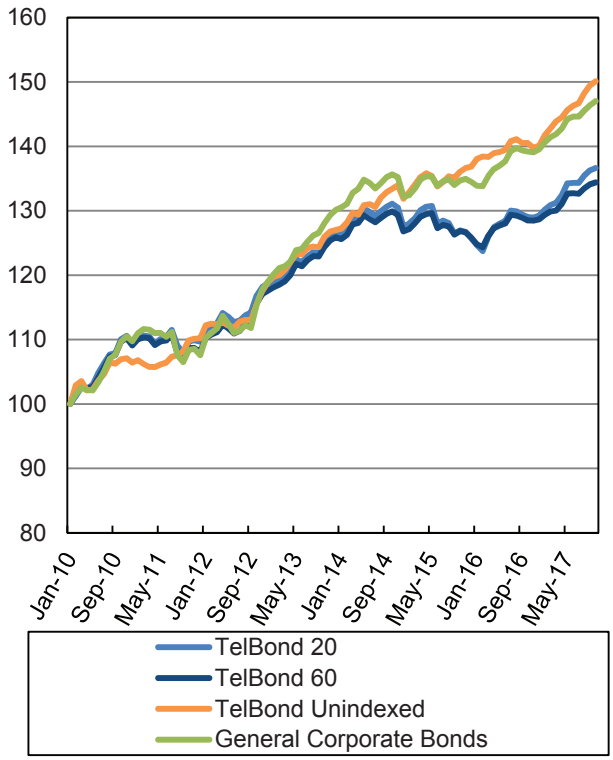
[44] The overall P/E ratio of stocks included in the TA-90 Index more reliably reflects the state of the economy, as it is impacted less by the performance of financial institutions and large companies with wide ranging global activity. This ratio is currently 14, while the ratio of all public companies is 32, and it is low compared to the ratio in other periods of solid growth. The cyclically adjusted P/E ratio for all the companies in the TASE (CAPE Shiller) and the ratio of total market value of all public companies to GDP are also below their historical average, and thus over the medium term the price level is reasonable.

Figure 7
The Weighted Average of Spreads Between the Yields on CPI-Indexed Corporate Bonds (Excl. Structured and Convertible) and the Yields on Parallel Gov't Bonds, by Industry, January 2010 to July 2017 (monthly data, percentage points)



SOURCE: Bank of Israel calculations.

Figure 8
Development of the Corporate Bond Indices, January 2010 to October 2017

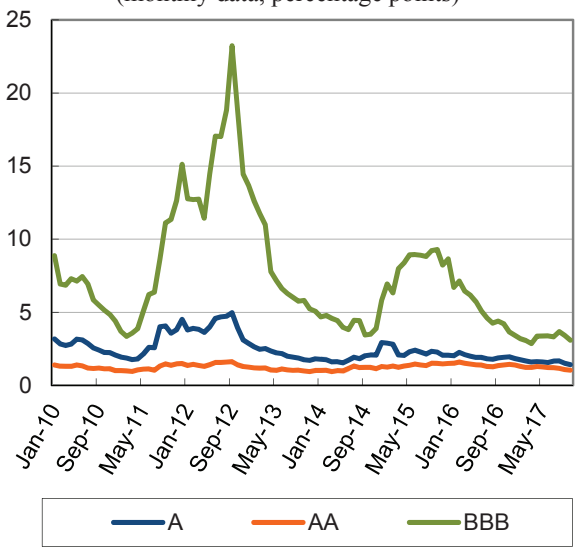


SOURCE: Tel Aviv Stock Exchange.

Against the background of the moderation in the decline of spreads, in recent months there has been a shift in savings to safer horizons—a trend reflected in net withdrawals from corporate bond (and equity) mutual funds, and net new investment in government and general bond funds. However, the scope of the net withdrawals from corporate bond funds was too low to impact notably on the spreads at which the corporate bonds are traded. Despite the most recent developments of recent months, vigorous activity in the corporate bond market continues in parallel with the decline in spreads, indicating that investors increased their demand—the share of corporate bonds held by the public directly or through mutual funds increased from 57.4 percent in mid-2016 to 60.2 percent in July 2017, at the expense of the share held by institutional investors.

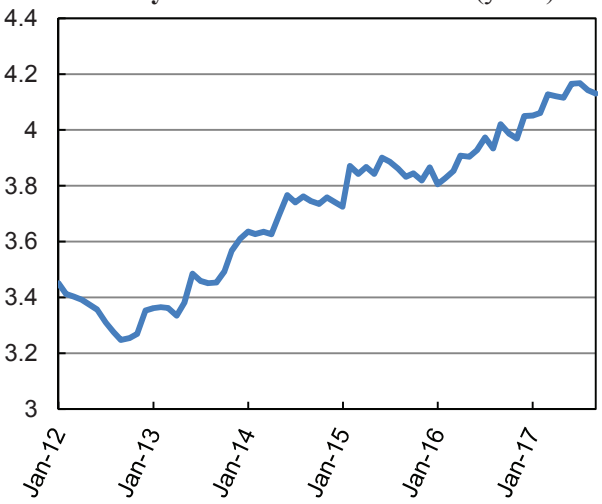
With regard to interest rate risk, the average duration in the bond market (Figure 10) continued to increase in the second half as well, reaching a historical record. Given the low interest rate level, the continued extension of the duration increases investors' exposure to significant losses as a result of a change (even a minute one) in the trend of interest rates in the market.

Figure 9
The Weighted Average of Spreads Between the Yields on CPI-Indexed Corporate Bonds (Excl. Structured and Convertible) and the Yields on Parallel Gov't Bonds, by Rating, January 2010 to July 2017
(monthly data, percentage points)



SOURCE: Bank of Israel calculations.

Figure 10
Estimated Average Duration, Business Sector Excluding Banks and Insurance Companies, January 2012 to November 2017 (years)

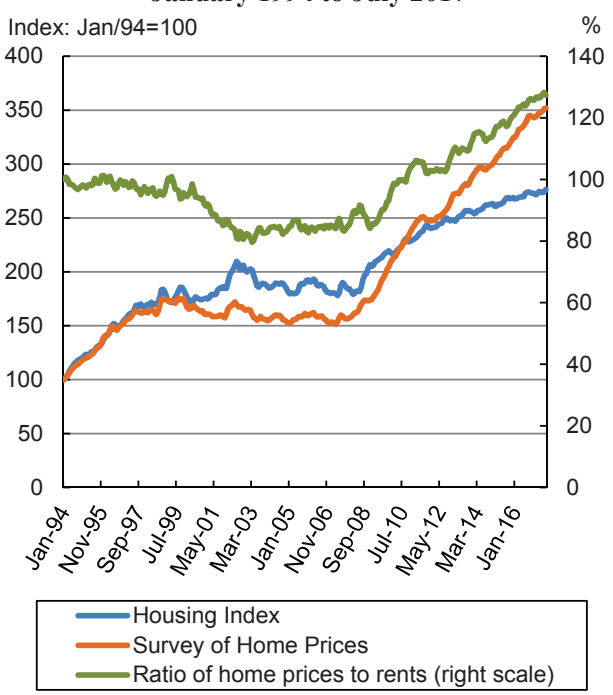


SOURCE: Bank of Israel calculations.

Housing prices: In the 12 months that ended in September, home prices increased by 2.9 percent, while in recent months the pace of annual increase was 4.5 percent. The relatively sharp decline in the pace of growth derives from a high index reading exiting the annual data (1.0 percent in August 2016) and a low index reading entering it (0.1 percent in August 2017). The most recent data indicate that in the most recent six months, the rate of increase in prices declined somewhat (4.5 percent in annual terms in the months ending in July, compared with 5.5 percent in the months ending in August).

Home prices based on the hedonic index and the Case-Shiller index also point to an annual growth rate that ranges around 5 percent (the calculation was made for July). Rents over the 12 months ending in October rose by 2.2 percent. As a result, the gap between the home prices index and the housing index continued to widen (Figure 11). The indicator used to monitor in real time explosive conduct in the housing market continues to

Figure 11
Housing Index, Survey of Home Prices, and the Ratio of Home Prices to Rents, January 1994 to July 2017

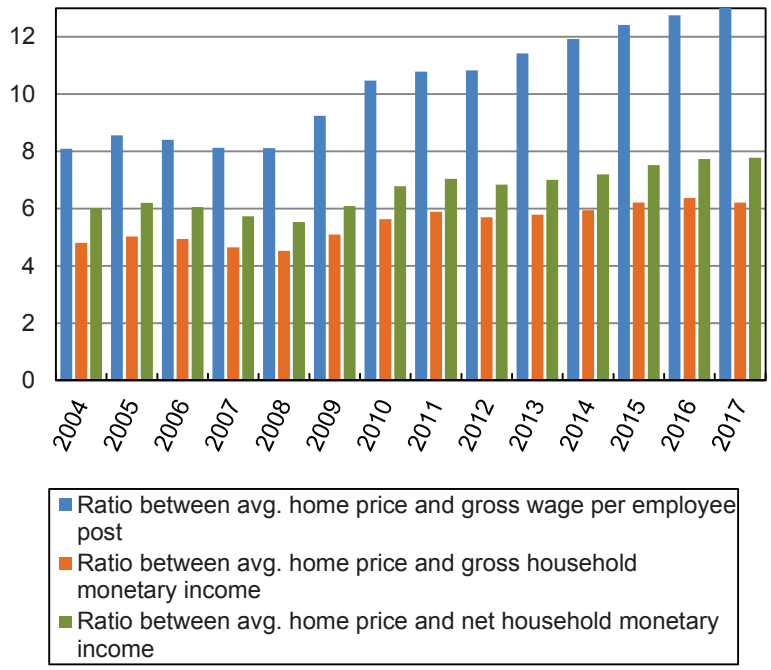


SOURCE: Bank of Israel calculations.

point to explosiveness:[45] home prices are moving away from rents at an accelerated pace—at the national level and particularly in the metropolitan Tel Aviv area.

Asset pricing in the housing market can also be assessed by examining prices relative to wages or income, a parameter that reflects individuals' purchasing power. This indicator is pointing to a historic high in the reviewed period as well. However, recent years' increase in home prices seems moderate when looking at average income per household. This income increased because the employment rate increased, mainly due to an increase in the labor force participation rate (Figure 12).

Figure 12
Ratio of the Average Home Price to the Average Wage per Employee Post and to Income per Household, 2004–17
(income years)



SOURCE: Based on Central Bureau of Statistics data.

Against the background of the main trends in the housing market, the overall scope of transactions remained moderate relative to the scope in 2016, and investors' share of transactions particularly decreased[46], a development that derived in the reviewed period mainly from a slight increase in the number of transactions carried out by first time home buyers. The number of transactions by investors remained stable and low. The share of investors in total new home transactions declined markedly in the past two years, among other things as a result of the regulatory steps taken in recent years.

The growth rate of mortgages remained stable, and indicators of risk for household debt were stable (an extended discussion appears in the section on credit).

[45] The indicator is based on the ratio of the home prices index and the housing (rents) index. See Caspi, I. (2015). "Testing for a Housing Bubble at the National and Regional Level: The Case of Israel", Discussion Paper Series, Bank of Israel.

[46] Home prices increased in recent years in parallel with the decline in long term yields (see Box 3). Assuming that real estate and financial assets serve as alternative investment channels, they should yield similar returns for their owners. This is in line with differences in risk, liquidity of the asset, and in the business results related to holding it. The yield on a home (annual rent divided by price) continued to decline during the reviewed period, and in parallel the yield on government bonds declined, though at a less rapid pace. Although as a result, there was a (slight) narrowing of the spread between the yield on owning a home and the yield on government bonds, the gap between them remains significant (2.4 percentage points), which indicates that investment in homes continues to be attractive.

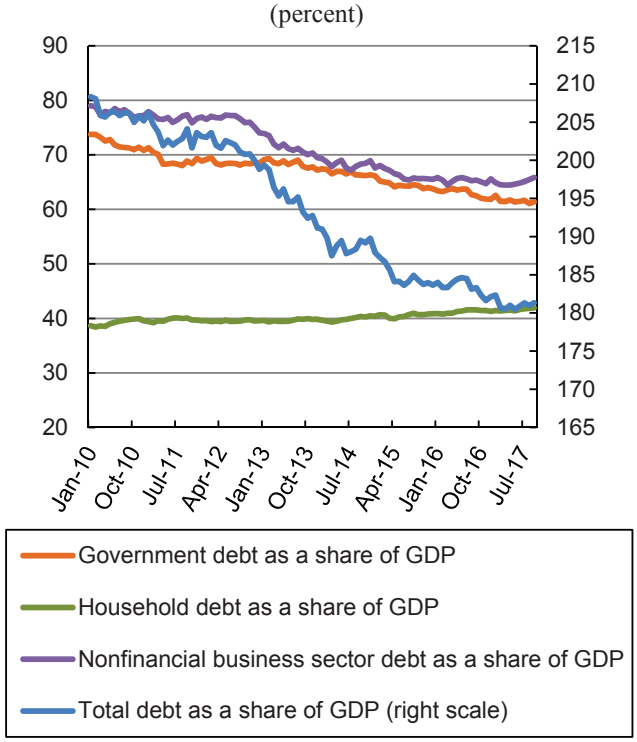
Credit

Business sector Household sector Financial sector (credit risks) Shadow banking	2017:1	2017:2
		

Credit in the economy is one of the main exposures to risk. The general debt of households relative to GDP in on an upward trend, although the growth rate slowed in recent months and its level is still low from an international perspective. The data indicate that borrowers' risk profile is rising and that construction and real estate companies continue raising debt.

Credit to the nonfinancial business sector: At the end of October, total credit to the nonfinancial business sector was NIS 872 billion—2.6 percent higher than its total at the end of the second quarter of the year. This increase derived from nonbank credit increasing by 2.8 percent and the shekel value of credit from abroad increased by 4.8 percent due to the depreciation that occurred in the shekel during the period reviewed. Credit from banks grew by only 1.4 percent. Overall, for the period reviewed, the nonfinancial business sector's debt was about 65 percent of GDP, in line with the trend of stability that has characterized it since 2014 (Figure 13).

Figure 13
Ratio of Total Debt and its Segments to GDP, January 2010 to September 2017
(percent)



SOURCE: Bank of Israel calculations.

The scope of net funds raised, both in the period reviewed and from the beginning of the year, was positive in all the nonfinancial industries except the trade and services industry. The manufacturing industry increased net funds raised, and the real estate industry's considerable positive net funds raised continued this year as well. In July-August, bond market issuances reached NIS 7.2 billion (NIS 6.82 billion excluding banks and insurance companies) (Figure 14), and from the beginning of the year it has totaled about NIS 39 billion.[47] In the 12 months preceding July, the pace of monthly issuances was NIS 5.41 billion. The amount raised by the nonfinancial sector via bonds issued to the public was about 87 percent of the total amount that companies raised on the Tel Aviv Stock Exchange via bonds, while in the previous year it was about 70 percent. As the markets continue to operate in a low

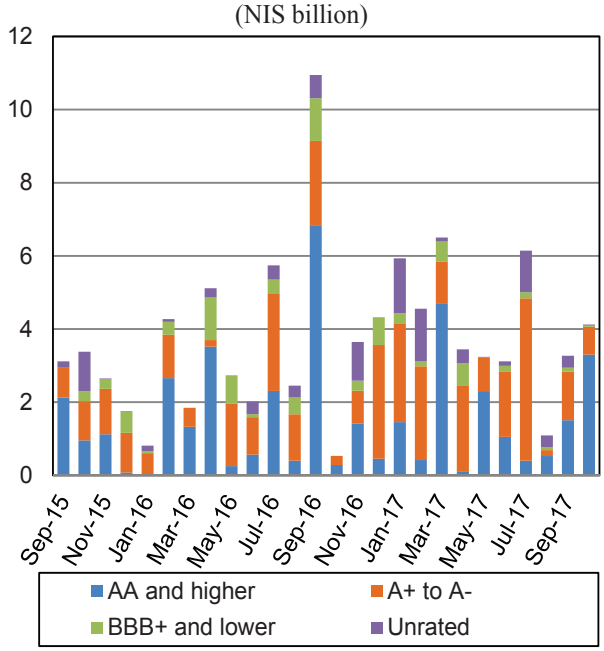
[47] Stock market data indicate that the fund raising via fixed-rate unindexed bonds reached NIS 29 billion this year (Sept. 2016–Sept. 2017), while in Sept. 2015–Sept. 2016 it reached NIS 33 billion, and this year as well it made up about half the amount that was raised from the public. Funds raised via CPI-indexed bonds declined from about NIS 31 billion in Sept. 2015–Sept. 2016 (about 47 percent of total funds raised) to about NIS 18 billion in Sept. 2016–Sept. 2017 (about 32 percent).

interest rate environment, most of the amount raised is intended to repay tradable bonds this year and next, and part of it is intended to roll over nontradable debt and to expand companies' activities. The real estate industry continues to stand out this year: it raised about 37 percent (about NIS 14.77 billion) of the amount raised by companies in the real sector, while in the previous year it raised about 35 percent. This industry continues to be responsible for a very considerable share of bond balances of the nonfinancial sector. A large majority of the debt raised during the period reviewed was unsecured and rated A- and higher. The debt balance (by market value) at the higher investment ratings (AA- and higher) increased in recent months to 54.83 percent.

The scope of bonds issued by foreign companies in Israel moderated during 2016 (it declined from NIS 5.4 billion in 2015 to NIS 3.9 billion in 2016), but in the past eight months (through August 2017) they raised NIS 6.1 billion.[48] Bonds issued by foreign companies in 2017 make up about 15 percent of the bonds issued by the nonfinancial business sector since the beginning of the year and about 30 percent of the bonds issued by the construction and real estate industry during the period.

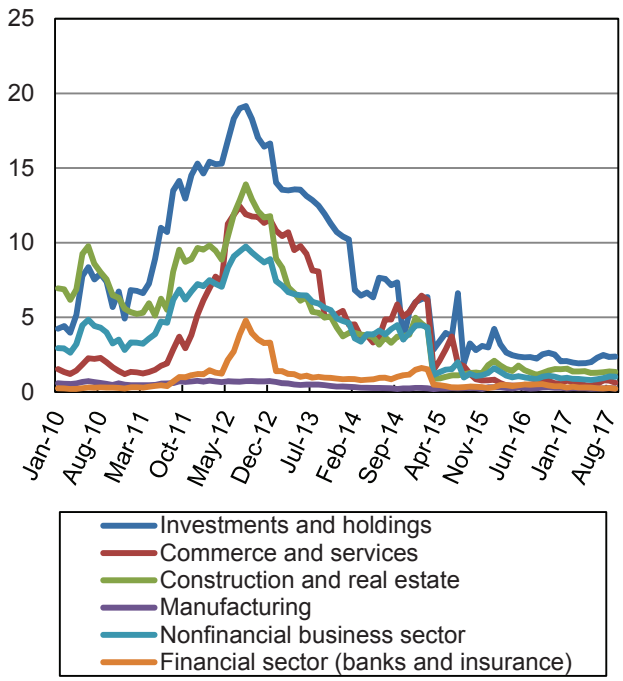
The leverage of companies in the various industries remains high and did not markedly change during the second quarter. The construction and real estate industry stood out among the industries in terms of leverage: the median leverage level at construction companies was 77 percent. This industry is sensitive to changes in home prices, and thus is liable to find it difficult to service the debt following to a change in trend. As of now, low prices enable

Figure 14
Corporate Bonds Issued by the Business Sector Excl. Banks and Insurance Companies, by Rating[a], September 2015 to October 2017
(NIS billion)



[a] Domestdic rating. Companies that have only an international rating are considered unrated.
SOURCE: Bank of Israel calculations.

Figure 15
Likelihood of Default (EDF) of Public Companies by Industry[a], January 2010 to September 2017 (percent)



[a] Monthly data, weighted average.
SOURCE: Based on Moody's KMV.

[48] Two companies that had never before raised money in Israel were responsible for approximately 30 percent of the amount raised in 2017.

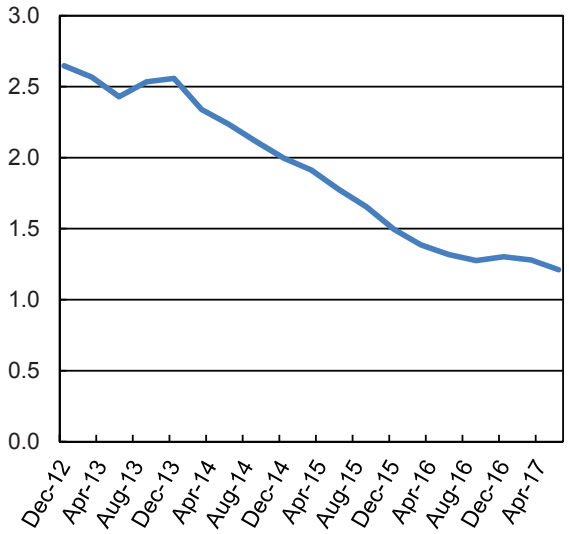
real estate companies to raise funds cheaply and to compensate for the relatively low current ratio.[49] We note that some listed companies in this industry operate outside Israel and therefore are less exposed to domestic market trends. According to the EDF indicator (Figure 15), the probability of default among public companies remained low in all industries in the period reviewed as well, and the share of actual default in the economy is less than 1 percent (based on debt balance).

The Companies Survey indicates that financing constraints for companies overall in the economy declined in all industries during the first two quarters of the year (when examining the cost of raising funds through bank credit by the various industries, it is found that it remained stable in all the sectors except for micro companies, where there was an increase in the cost of credit from the beginning of the year). Moreover, against the background of companies' profitability levels, the high level of macroeconomic activity and continued solid fund raisings in the business sector, the level of problematic debts in the business sector declined in the banking system (Figure 16). This figure is about NIS 19 billion and has been stable in the past two years.

The household sector: Households' outstanding debt increased in July-August by 0.7 percent. The increase derives from a rise of 0.8 percent in housing credit and by 0.6 percent in nonhousing credit. From the beginning of the year, the balance of credit to households increased by 3.7 percent, after housing credit expanded by 4 percent and nonhousing credit increased by 3.1 percent. Household debt relative to GDP was 42 percent, a low value compared with parallel values in advanced economies, though it continued to increase this year.

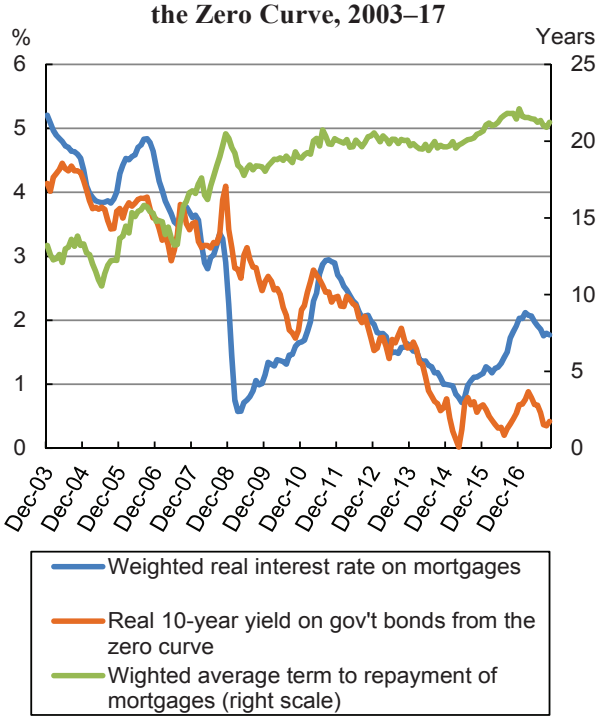
Housing credit continued to expand. This development occurred in a period in which the costs of raising funds for households declined (Figure 17)—interest rates on new mortgages granted during the period reviewed continued to decline on both the CPI-indexed track and the unindexed track. This is a continuation of the trend that began in February 2017 (when the interest rate reached a peak),

Figure 16
Total Problematic Business Sector Debts As A Share of the Total Balance Sheet, December 2012 to June 2017



[a] Including borrowers' activity abroad.
SOURCE: Banking Supervision Department.

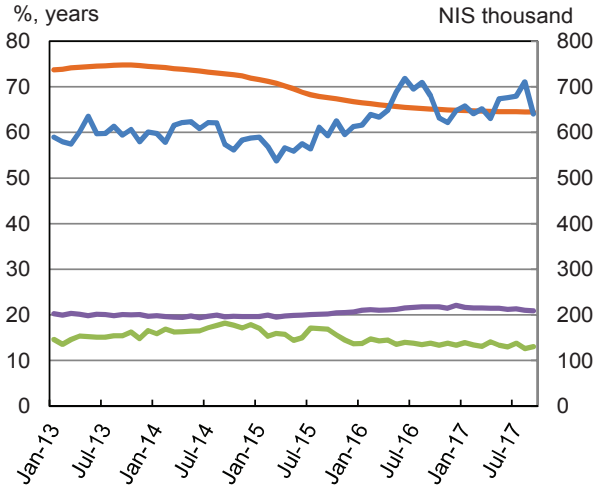
Figure 17
Weighted Real Interest Rate on Mortgages and Real 10-Year Yield on Government Bonds from the Zero Curve, 2003–17



SOURCE: Bank of Israel calculations.

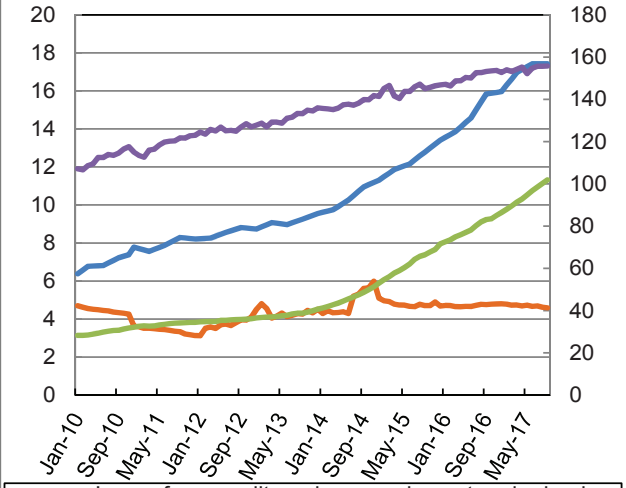
[49] Due to the accounting requirement to value assets at their fair value, a decline in asset prices in the housing and commercial real estate market will automatically turn into an increase in leverage.

Figure 18
Development of Mortgage Risk Indices, January 2013 to September 2017



SOURCE: Bank of Israel calculations.

Figure 19
Development of Nonhousing Credit by Various Sources, January 2010 to September 2017
(NIS billion)



SOURCE: Bank of Israel calculations.

after a period of continued increases that began around March 2015. The decline in the real weighted interest rate that occurred in the reviewed period was in parallel to a decline in the yield on CPI-indexed government bonds, and against the background of a decline in risk characteristics on the loans.[50] With that, the cost of credit for housing remains high.

With regard to indicators of risk in mortgages, the LTV and the share of mortgages at variable interest rates were stable. The distribution of estimates for LTV and PTI in recent years does not indicate an increase in borrower risk. The term to final payment, an indicator that rose in recent years, stabilized in the reviewed period and even declined slightly compared with 2016, and is at 21.5 years, on average (Figure 18). Investors' share in new mortgages declined in the reviewed period to around 13 percent, continuing a trend created in recent years.

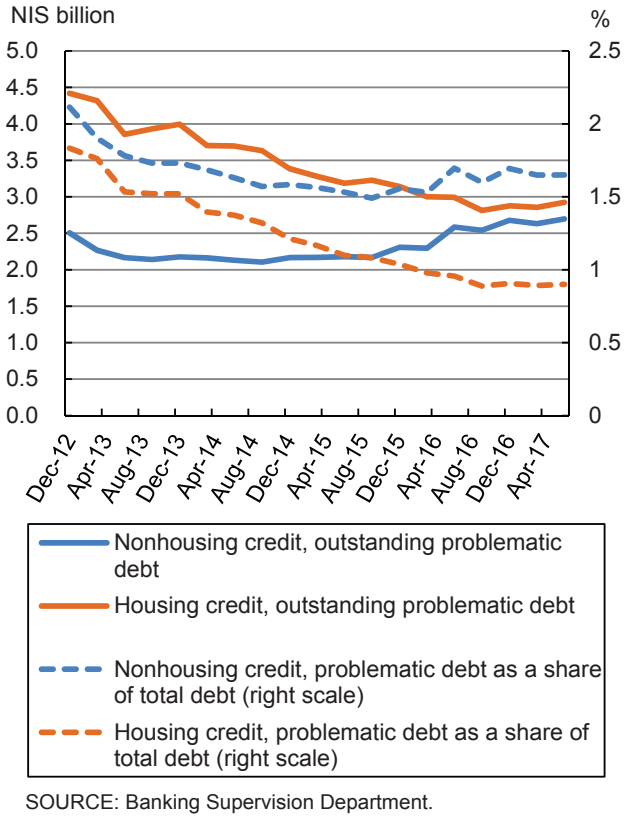
Very few households are finding it difficult to meet their mortgage payments, apparently due to a combination of a low interest rate environment and a long period of growth characterized by low unemployment rates and persistent growth in the number of employed people and in income levels. Banks—Israeli households' main source of financing purchases of real estate—continue to report a decline in the balance of problematic debts and in the share of such loans out of housing loans.

Credit that is not for housing (consumer credit)[51] also continued to expand, though at a slower pace (3.1 percent). In October 2017, its balance was about NIS 192 billion, making up around 37 percent of total credit to households. Banks continue to supply most of it: their share in this credit is 83 percent, even though institutional investors and credit card companies have expanded their share in this activity segment in recent years (Figure 19).

[50] The estimate for the size of the average loan was NIS 660,000, while in 2016 it was NIS 667,000.

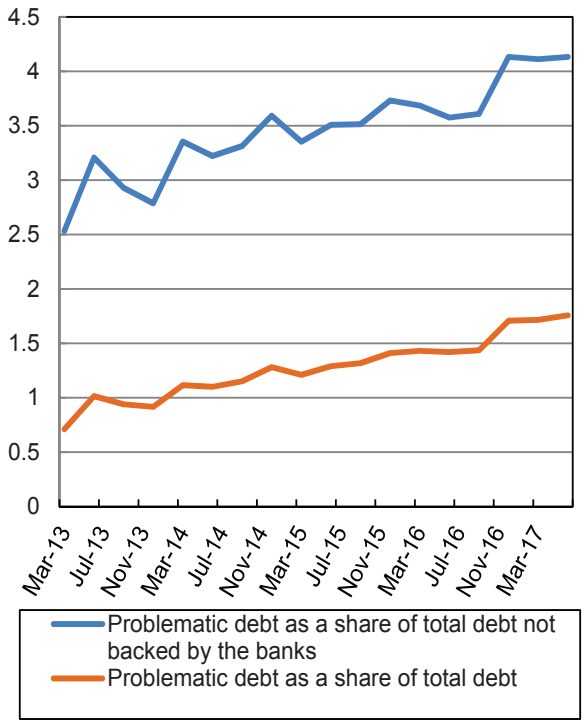
[51] The credit balance is equal to the debt balance net of allowance for doubtful debts at banks.

Figure 20
Problematic Debts in the Housing Credit and Nonhousing Credit Fields, Private Individuals, December 2012 to June 2017



SOURCE: Banking Supervision Department.

Figure 21
Problematic Debts as a Share of Consumer Debt at the Credit Card Companies, March 2013 to June 2017 (percent)



SOURCE: Banking Supervision Department.

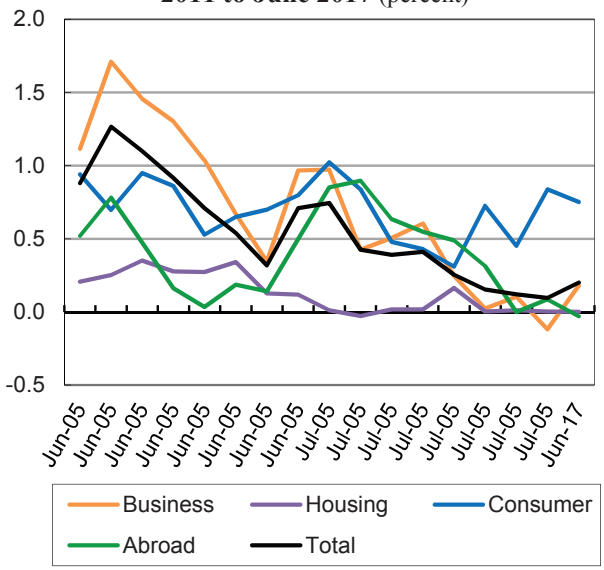
Credit that is not for housing is made up mostly (about 90 percent) of unindexed credit, the average term to repayment is slightly above 5 years (this period has lengthened in recent years), and the average interest rate is around 6 percent, markedly higher than the interest rate on loans to the business sector (in all categories of company size). The expansion in credit supply by credit card companies continued to be helped by the low interest rate environment[52] and by the advancement of technology that eases the process of taking out a loan. However, the pace of expansion began to moderate during the period reviewed, and it is likely that this derives from credit card companies changing their policy in view of an increase in problematic loans (Figure 21), difficulty in collecting debts, and the costs derived from this. Most of the credit from credit card companies is not secured, and in essence there is only backing for vehicle purchase loans, as they are guaranteed by their pledge.[53]

We emphasize that the risks in credit that is not for housing are different than the risks in housing credit: consumer credit is mostly unsecured and therefore a bankruptcy by an individual in this sector is handled differently and involves high costs. In view of the risk inherent in it, and due to the marked expansion in its scope, banks and credit card companies markedly increased (Figure 22) their loan loss provisions in this sector.

[52] Note that the average interest rate is impacted by the composition of the loans. To illustrate, it declines when loans for purchasing an automobile take up a large share, as they are granted against a pledge and bear a relatively low interest rate.

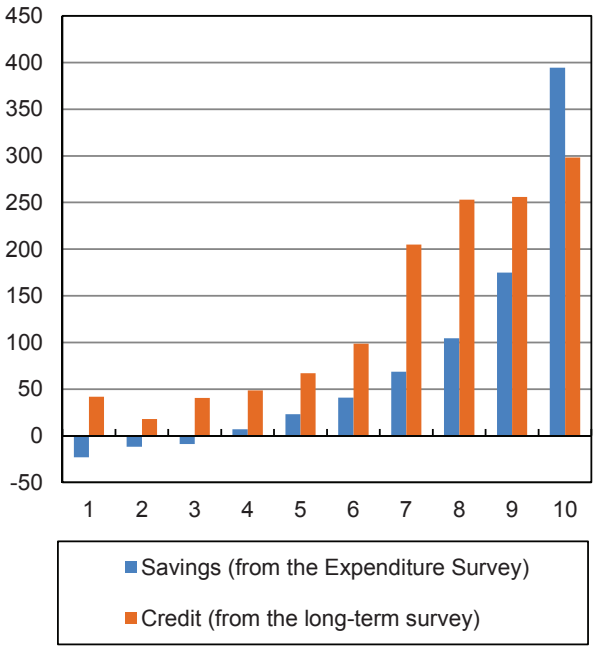
[53] Leumi Card reports that such loans make up about a third of credit to private individuals (households). At some other companies the share is much smaller, around only 10 percent.

Figure 22
Loan Loss Provisions as a Share of Total Balance-Sheet Credit in the Industry, the Five Large Banking Groups, 2011 to June 2017 (percent)



SOURCE: Based on published financial statements.

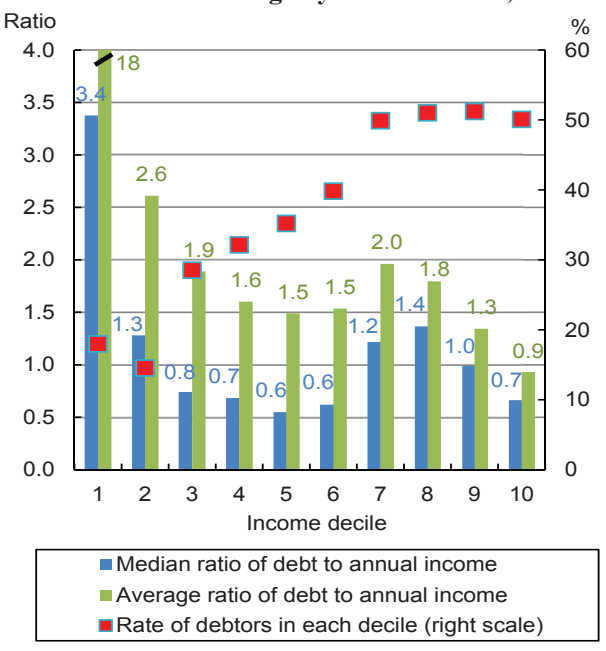
Figure 23
Household Credit and Savings by Income Decile, Yearly Averages, 2015 (NIS thousand)



SOURCE: Based on Central Bureau of Statistics.

The share of problematic debts in the nonhousing credit sector increased at both banks and credit card companies: due to the expansion of credit to households, the average share of problematic debts in debts that are not guaranteed by the banks increased, from about 2.9 percent in 2013 to around 4.13 percent in June 2017.[54] The share of problematic debts at banks remained stable during the year at 1.65 percent (Figure 20). An observation over the long term indicates that the share of problematic debts in the system (banks and credit card companies) is similar to the share at the height of the cycle and just before a reversal of the trend in economic activity. It is important to emphasize that the growth in consumer credit—and with it the increase in the shares of problematic debts and in provisions for credit losses at banks and credit card companies—is occurring in a period of low unemployment and growth in household income. Furthermore, based on the

Figure 24
Household Leverage by Income Decile, 2015



SOURCE: Based on Central Bureau of Statistics.

[54] It is reasonable to assume that the rapid expansion of credit from credit card companies was accompanied by an increase in the level of risk due to riskier borrowers being added—for example, borrowers with lower incomes compared to the past.

analysis of the long term survey and the Income and Expenditure Survey, it can be said that it is occurring in income deciles in which the security buffers are relatively diminished (Figures 23 and 24).

Credit risks in the banking system:[55] Over the course of the first half of 2017, the balance sheet credit portfolio of the five banking groups grew by about 3 percent in annual terms. Most of the growth in the portfolio derived from credit to households growing by 5.2 percent—consumer credit increased by 6.3 percent while credit for housing expanded by 4.7 percent—a pace similar to that of 2016 but lower than the pace of previous years. Consumer credit's rapid growth rate in recent years is a main focal point of risk for banks and borrowers.

Business credit grew in the period reviewed by 3.4 percent, the highest growth rate in recent years. Growth in business credit derives mainly from credit to small and very small businesses increasing by about 8.8 percent, and from credit to medium-sized businesses growing by 1.1 percent. Credit to large companies declined moderately, by only 0.1 percent. Most of the growth in business credit derives from credit to the construction industry, which grew by 22.5 percent, while credit to the real estate industry declined by about 4 percent. These two industries, together with housing credit, account for more than 45 percent of the credit portfolio of the banking system, and due to their large share they continue to be a main focal point of risk to the banking system. The indices of credit quality that are calculated from financial statements indicate that the bank credit portfolio's risk increased somewhat, but in contrast there has been an improvement in the banking system's ability to deal with expected failures.

Shadow banking:[56] Alongside the banking system and banking credit, shadow banking has developed in recent years. This banking has potential to expand, which requires continued monitoring, and this is seen in recent regulatory changes, the demand for credit by small and medium businesses, and the entrance of institutional investors into the sector. With that, the credit portfolio of public credit companies is still small compared with the scope of credit provided by banking corporations and institutional investors, and the debt that these companies owe banks and the public remains relatively low, and therefore this sector is not identified as a source of macroprudential risk.

[55] There are differences between the data in this section and the data in previous sections, due to differences in methodologies for classifying the credit in the various sectors. The first part of this chapter presents credit risks from the viewpoint of consumers, while the section dealing with credit risks in the banking system focuses on the viewpoint of banks and is based on direct reports to the Banking Supervision Department.

[56] There is an expanded discussion in Box 1.

Liquidity

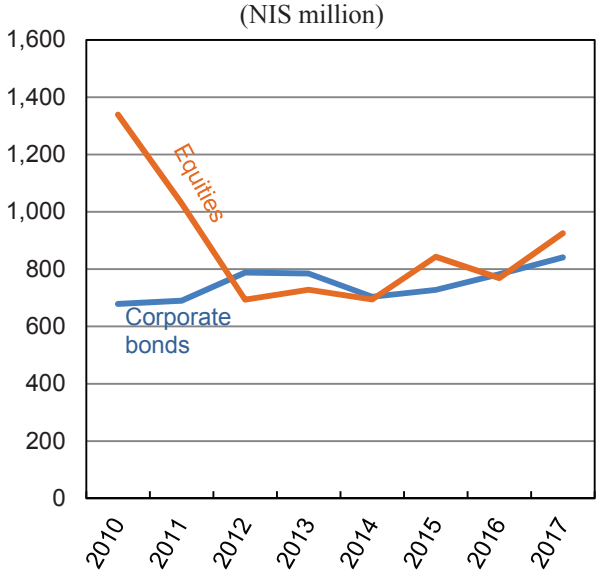
	2017:1	2017:2
Funding conditions		
Liquidity in markets		
Liquidity ratios (balance)		

Liquidity risks continue to exist in Israel's financial system though at relatively low strength.

Liquidity in markets: An analysis of the second half of the year indicates that liquidity in financial markets remains high: average daily trading volume in the stock market increased by 15 percent, from NIS 1.26 billion in 2016 to NIS 1.45 billion since the beginning of the year. Likewise, the trend of decline in this indicator in recent years halted.[57] Trading volumes in corporate bonds, excluding exchange-traded notes, increased in recent months (as well as from the beginning of the year) and reached NIS 890 million, while they were NIS 831 million at the end of 2016 (Figure 25).

However, it should be noted that the concentration in trading is still high, and most of the increase in liquidity (especially in the stock market) derives from an improvement in liquidity in a small number of securities.

Figure 25
Average Daily Trading Volume in Equities and Corporate Bonds in Israel, 2010 to 2017
(NIS million)



SOURCE: Bank of Israel calculations.

Corporate liquidity: The financial ratios at the company level indicate that the immediate liquidity[58] (Figure 26) of real companies declined slightly from the beginning of the year, and at the end of the second quarter it reached 21 percent. The current ratio of all the real companies is close to 1.2 and similar to the long term average. However, among companies in the construction and real estate industry it declined to below 1. The current ratio at real estate companies has been low already for a considerable amount of time (and similar to its historic level), and reflects potential difficulties in repayment capacity and indicates a relatively high liquidity risk.[59]

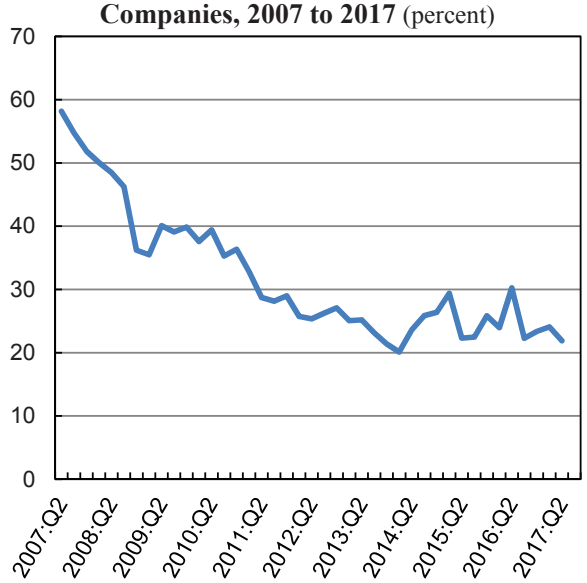
[57] Just prior to the reform in the stock exchange on February 9, 2017, a 6.5-year record was broken, with daily trading volume reaching a very significant scope of about NIS 12 billion.

[58] Total cash, cash equivalents, and short term investments relative to current liabilities.

[59] The current ratio is based on the assumption that if a company gets to financial difficulties, first and foremost it will face pressures in the current liabilities sections. That is, suppliers will demand payment from the company in cash, and will decline to extend it suppliers' credit, while banks and other credit providers will refuse to renew its loans when they come due. In both cases, the company will have to attain sources of funding in order to finance the suppliers' credit and loans that will not be renewed, and will be able to do so only by selling current assets, such as bank deposits, short term securities, and inventory (the inventory section is especially relevant to contractors).

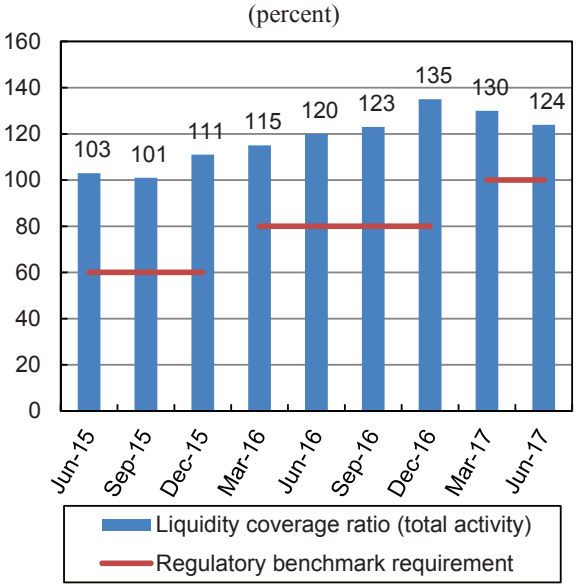
Liquidity risk at banks: This year the aggregate value of the Liquidity Coverage Ratio (LCR) declined[60], and in June 2017 it was about 124 percent (compared to about 135 percent in December 2016) (Figure 27). This decline occurs after two consecutive years in which banks gradually accumulated liquid assets (the cumulative increase reached 38 percent) in order to converge to and meet the minimum requirements set by the Banking Supervision Department in Proper Conduct of Banking Business Directives. Liquidity surpluses eroded in the reviewed period in every one of the large groups, while the small banks—which have high liquidity surpluses—maintained stability. However, despite the decline, the value of the ratio at every bank was higher than 100 percent, the minimum required for full implementation of the Banking Supervision Department's directives, implementation that went into effect in January 2017.[61] An examination of the composition of the ratio indicates that the change in its value was impacted more by the increase in net outflows (about 15 percent in annual terms) and less by the decrease in the scope of liquid assets (about 3 percent in annual terms). With regard to the structure of the sources, it eroded further this year with the increase in the share of demand deposits, against the background of the low interest rate, but it is still stable, and it appears that Israeli banks continue to rely on retail deposits as a main source of financing their activity (about 54 percent), and less on wholesale financial financing (about 25 percent) and other wholesale financing (about 22 percent).

Figure 26
Immediate Liquidity[a] of Nonfinancial Companies, 2007 to 2017 (percent)



[a] In order to calculate immediate liquidity, we add cash, cash equivalents, and short-term investments, and divide the total by current liabilities.
SOURCE: Bank of Israel calculations.

Figure 27
Liquidity Coverage Ratio (LCR), Total Banking System[a], June 2015 to June 2017
(percent)



[a] Calculated on a consolidated basis.
SOURCE: Based on published financial statements.

[60] The "Liquidity Coverage Ratio" was developed by the Basel Committee in order to promote the short term resilience of banking corporations' liquidity profile.

[61] Total activity, on a consolidated basis.

Interconnectedness

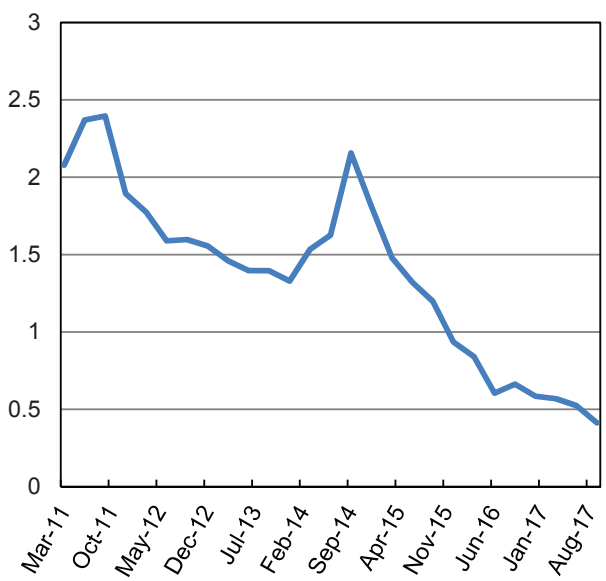
	2017:1	2017:2
Value at risk/Shared exposure		
Mutual dependence in the asset markets		
Interconnectedness		

Interconnectedness in the domestic financial market remained medium. Direct exposure among financial institutions shows a mixed trend, among other things due to a decline in bilateral exposure among banks. Indirect exposure is increasing.

The level of interconnectedness in the financial system—and as a result of it, the potential for contagion in it—is important in assessing the exposure to risks and the level of system-wide vulnerability (systemic risk). The interconnectedness in the system is created through two main channels: (1) directly, through the exposure of one financial institution to another, and (2) indirectly, through exposure of financial institutions to a common third party. The direct exposure presents a mixed trend: it is growing because institutional entities are expanding their investment in banks (Figure 29). However, it is declining as banks are decreasing their exposure to insurance companies and institutional entities (that is, the share of their holdings in securities of financial institutions) (Figure 28), and because banks are reducing the scope of bilateral exposure. Based on net indebtedness, bilateral exposure declined from about NIS 26 billion in 2011 to about NIS 12 billion in 2016. The exposure of the banking system to financial institutions abroad also declined.

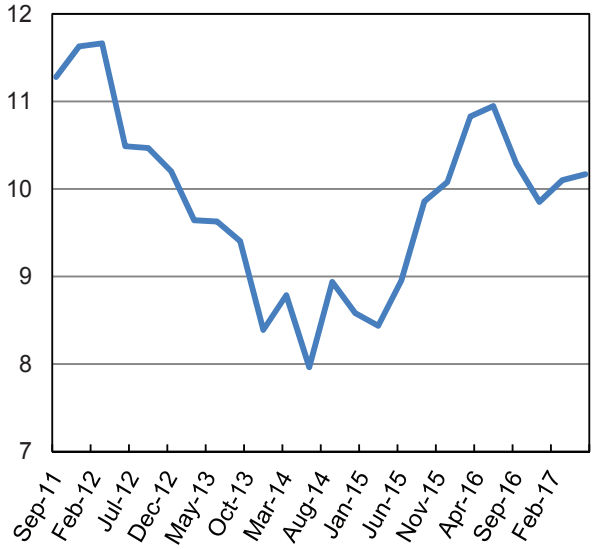
In contrast, indirect exposure has risen due to banks consistently expanding the use of syndication transactions (the balance of credit risk in syndication transactions for which banks provide considerable service reached NIS 74 billion at the end of 2016, and in the preceding three years it expanded by about 20 percent on average) (Figure 30). This was due to an increase in sales of credit risks/portfolios (the balance of credit risk sold for which banks provide service doubled between 2015 and 2016), and due to overlapping portfolios in large credit exposures (see Box 2).

Figure 28
Holdings of the Five Large Banks in the Securities of Financial Institutions in Israel as a Share of Their Securities Holdings, 2011–17 (percent)



SOURCE: Banking Supervision Department.

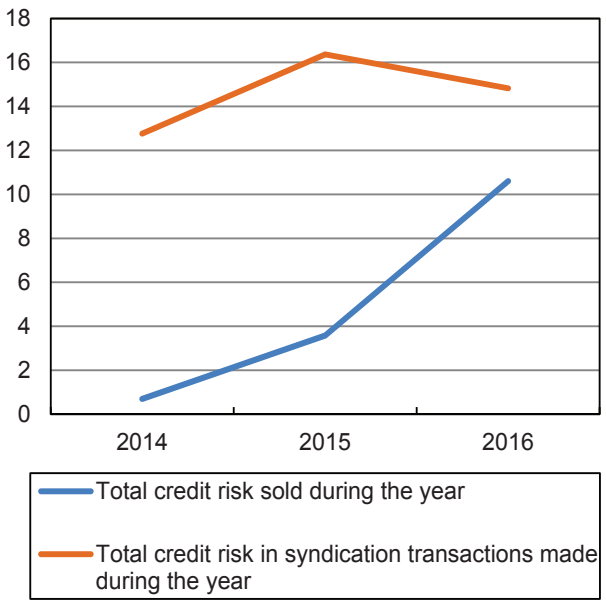
Figure 29
Institutional Investors[a] Holdings of the Securities of Banks in Israel as a Share of Total Institutional Holdings, September 2011 to June 2017 (percent)



[a] Insurance companies, pension funds, provident funds and advanced training funds.

SOURCE: Based on Praedicta.

Figure 30
Credit Portfolios Sold by the Five Large Banks to the Insitutional Investors, and Credit in Syndication Transactions Made with Them, 2014–16 (NIS billion)



SOURCE: Banking Supervision Department.

Box 1
Developments in the activity of public companies providing nonbank credit

Matan Waynberg

- The volume of nonbank credit in Israel has increased rapidly in recent years. From mid-2016 until mid-2017, the credit portfolio of public companies in the industry grew by about 32 percent.
- The Economic Arrangements Law for 2015–16 permits these companies to issue bonds. Since then, five of them have issued bonds with a total value of about NIS 1.9 billion.
- The concentration of customers of the public companies providing nonbank credit is higher than the parallel figure for banks, and the same is true for the rate of annual loan loss provisions.
- These companies still provide little credit relative to the banks, but due to changes in regulation, the entry of institutional investors to the industry, and the demand for consumer and business credit, there is significant growth potential for the field, and it is therefore necessary to continue monitoring it.

1. Background

The area of nonbank credit has grown rapidly in recent years, and as of September 2017, there are seven companies traded on the Tel Aviv Stock Exchange (public companies) that operate in the area. These companies target most of their credit to small and medium enterprises (SME), and as Table 1 shows, their credit portfolio in mid-2017 stood at about NIS 2.9 billion—about 32 percent higher than at the same period in 2016. Compared with the end of 2015[1], the period that preceded the significant regulatory change that will be discussed below, the value of the portfolio increased by about 40 percent.

This box reviews the activity of these companies—the public companies that provide nonbank credit—but before beginning such discussion, it should be noted that there are many private companies also active in the field. These companies provide credit to businesses (including through check discounting services, credit discounting services and factoring) and to households. But since they are private companies and are not required to publish financial statements to the public, it is difficult to estimate the volume of their activity.[2] However, since they rely on bank credit and independent sources only, it is reasonable to assume that the volume of credit that they are able to provide does not reach dimensions that would have systemic prudential implications. There are also providers who supply consumer and business credit to finance the purchase of goods (mainly the same providers who supply the original credit or companies from that group), such as vehicle leasing companies and the financing arms of the various vehicle importers.

2. Characterization of the activity of public companies providing nonbank credit

The activity of the public companies providing nonbank credit is concentrated in the financing of imports and suppliers, and in the provision of short-term loans for any purpose to small and medium enterprises, mainly through trade in delayed payments (check discounting). Check discounting is a conversion transaction in which the customers of the credit companies endorse the post-dated checks of their customers to the credit

[1] It should be noted that between the end of 2015 and the middle of 2017, two public companies were added to the database. Net of their credit portfolios at the end of the period, the increase in the total volume of credit is about 30 percent.

[2] However, it should be noted that there is a large company active in the field that is not a public company. This is a subsidiary of an insurance company, and most of its activity involves household finance, including the financing of used vehicle purchases. This company's credit portfolio totaled about NIS 1.5 billion at the end of June 2017.

companies. The companies examine the financial strength of the issuer of the check, including through external and internal databases, and offer businesses cash in exchange for a fee, while the check serves as collateral. Sometimes, the post-dated checks are issued by a third party, and sometimes they are the personal checks of the company's customers. (In the second case, the customer makes the check out to the credit company and receives cash in exchange). If the check is not paid out, the credit company is permitted to demand payment from both the customer and the writer of the check.

The activity of the companies, in the area of post-dated checks and in general, is characterized by the provision of credit at higher interest rates than those offered by the banks. But in the field of check discounting, they are frequently a more attractive alternative, since the banks commonly demand a relatively high rate of collateral from borrowers, and require them to show strict financial relations, and SMEs sometimes find it difficult to meet those requirements. At the same time, nonbank finance companies generally pose less stringent requirements.

The companies providing nonbank credit are attractive to borrowers for two additional reasons. First, while large and medium businesses receive about 30 percent of their credit from institutional investors, small businesses mainly rely on finance from the banking system, and generally do not use alternative channels of finance. The expansion of activity of the companies providing nonbank credit makes it possible for small businesses to approach them if they have difficulty obtaining credit from the banks (due to high risk assessment and/or lack of collateral). Second, it seems that these companies have a process of obtaining credit through check discounting that is simpler and more rapid than the bureaucratic and complex process that is typical of banks.

3. Regulation and nonbank credit

The volume of nonbank credit in Israel has increased relatively rapidly due to the significant change recently made in the regulations applying to companies in this field. As part of the Economic Arrangements Law for 2015–16, the Knesset approved a change to the Banking Law permitting companies that provide nonbank credit to issue bonds, subject to the terms specified in the law. The change enables the companies to finance their activity through the issue of bonds, without having the Banking Law apply to them.

Prior to the change, most of the financing obtained by these companies was based on loans from banking corporations. Following the change, five of the companies issued bonds with a total value of about NIS 1.9 billion. The outstanding bonds of the public companies in the field was about NIS 1.2 billion at the end of the second quarter of 2017—about 43 percent higher than at the end of 2016 (NIS 816 million).[3] As a result, the companies became less dependent on bank credit, and bank credit as a share of their total liabilities is currently much lower—just 37.8 percent in mid-2017, compared with 81 percent at the end of 2015 (Table 1). Raising capital through bonds reduces the companies' dependence on bank credit, lowers the cost of their sources, and enables them to grow and to provide more credit, mainly to SMEs—sectors that, as stated, have no financing alternative other than the banks.

Another regulatory change that is expected to further increase the volume of nonbank credit has to do with the Supervision of Financial Services (Regulated Financial Services) Law, 5776–2016. This law makes all companies providing nonbank credit[4] subject to regulation and supervision by the Capital Market, Insurance

[3] Following the date of publication of the financial statements for the second quarter of 2017, another company issued tradable bonds with a total par value of about NIS 57 million.

[4] Private as well as public.

Table 1: Aggregate Balance-Sheet Data on Public Companies that Provide Nonbank Credit (NIS million), end of 2015 to mid-2017

Year/Quarter	Credit to customers	Total assets (current and non-current)	Total liabilities (current and non-current)	Credit from banking corporations as a share of total liabilities (percent)	Equity	Equity as a share of total assets (percent)
2015:Q4	2,080.2	2,092.8	1,670.0	82.60	474.0	22.65
2016:Q1	2,049.1	2,070.4	1,633.4	51.69	490.8	23.71
2016:Q2	2,215.1	2,307.2	1,776.1	54.69	531.1	23.02
2016:Q3	2,453.8	2,582.9	2,007.9	44.31	575.0	22.26
2016:Q4	2,845.1	2,954.6	2,248.4	50.36	706.1	23.90
2017:Q1	2,864.6	2,981.7	2,262.1	49.90	707.1	23.71
2017:Q2	2,920.2	3,146.0	2,375.7	37.80	770.3	24.48
Rate of change from the beginning of the period to the end (6 quarters)	40.38%	50.32%	42.26%	-44.8 (percentage points)	62.50%	1.8 (percentage points)

SOURCE: Based on published financial statements.

and Savings Authority[5], and among other things it requires them to obtain a license in order to provide credit, protect their customers' interests, meet capital requirements, and provide reports to the supervisory authority. Implementation of these regulations has already begun, and as it proceeds, the volume of information on the companies' activity and supervision of it will expand. It is reasonable to assume that the public's preparedness to take out credit from such companies, and investors' preparedness to lend to the public, will also increase.

4. Activity indices: Comparing banks and public companies that provide nonbank credit

If we compare the credit companies to the banks in terms of various activity indices, we find that the credit companies require more equity relative to total assets (the volume of credit they provide). In June 2017, the ratio among the companies was about 24.5 percent, while among the give large banking groups, it was about 7.2 percent on average. The banks operate with much higher leverage because they have an available and inexpensive source of credit—deposits from the public. This is because the public feels safe with the banks thanks to the close regulation and supervision that apply to them. In contrast, the credit companies do not have the ability to raise deposits from the public, and they operate on the basis of equity, bank loans and the issuance of bonds. Moreover, supervision over these companies began only recently, and is not as stringent as the supervision that applies to the banks. In order for the credit companies to be able to raise sources in order to provide credit under attractive terms, they must show a broader capital base than the banks.

Even so, the average return on assets (ROA) and return on capital of the credit companies (about 3.77 percent and about 15.39 percent respectively in June 2017) are higher than for the banks (0.61 percent and 9.41 percent respectively; Table 2). It is reasonable to hypothesize that the explanation for these differences has mainly to do with the nature of the credit companies' activities and the high rates of interest that they charge. As stated,

5 This function was recently separated from the Ministry of Finance.

these companies focus mainly on check discounting, a field where the interest rates charged are much higher than the interest rates on other commercial credit. This may reflect the possibility that the credit companies also provide loans to borrowers who are considered more risky, and some of those borrowers come to the credit companies because they do not meet the requirements imposed by the banks for the provision of credit. Table 2 shows that the credit companies have a higher annual loan loss provision as a share of total balance-sheet credit (about 1.02 percent in the second quarter of 2017) than the banks (0.2 percent). Accordingly, the credit risk of the companies may also to some extent explain the fact that their return on capital is higher than the return at the banks.

Table 2: Indices of credit portfolio quality and the return on equity: Nonbank credit companies compared with the five large banking groups (percent)

	2015:Q4		2016:Q4		2017:Q2	
	Banks	Nonbank credit companies	Banks	Nonbank credit companies	Banks	Nonbank credit companies
Annual loan loss provisions as a share of total balance-sheet credit	0.12	0.68	0.10	0.71	0.20	1.02
Return on assets	0.61	5.26	0.57	4.60	0.64	3.77
Return on equity	9.09	23.22	8.33	19.24	9.41	15.39

SOURCE: Based on published financial statements.

Figure 1 shows that the nonbank credit companies are considered more risky than the banks, and their sources are therefore more expensive. However, they are now considered less risky than in the past, and there is a general downward trend in the return on their bonds and on the spread between them and the return on bank bonds with a similar duration.

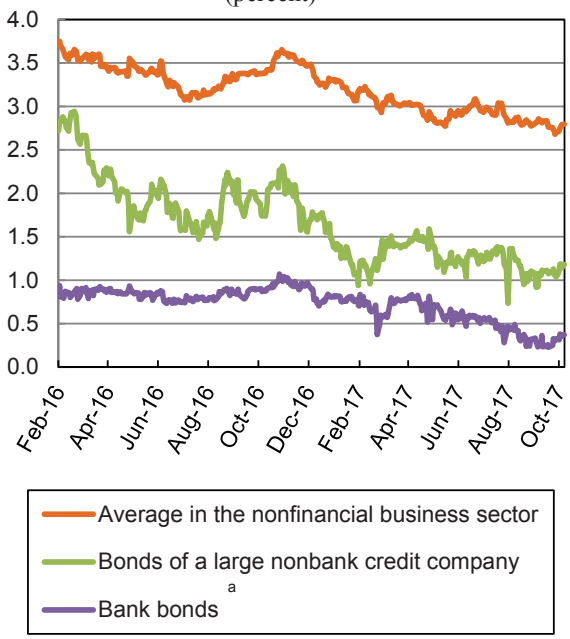
While the regulator requires banking corporations to meet various limitations on the credit portfolio—including limitations on the maximum rate of exposure to a specific industry, as detailed in the Supervisor of Banks Directives—the nonbank credit companies are not subject to limitations on the credit they provide to their customers. However, the customer portfolios of the various public companies in this field is not typified by over-concentration of industries. Their average concentration rates to individual industries do not greatly exceed the exposure rates permitted to the banks. The companies are mainly exposed to the construction and real estate industry and to the financial industry. According to assessments, at the end of 2016, customers from the construction and real estate industry accounted for about 22 percent of total customers, and the maximum exposure of an individual company to this industry was 27 percent. Customers from the finance industry at the time accounted for about 19 percent of all customers, and the maximum exposure of an individual company to that industry was 39 percent.

Customer concentration among the nonbank credit companies is higher than among the banks, and most of the companies are characterized by relatively high concentration. At the end of 2016, the average balance of credit

issued to the ten largest customers (borrowers) was about 28 percent of total credit of the five companies traded at the time on the stock exchange. At the same time, the average parallel figure among the five large banking groups was less than 3 percent (Figure 2). Furthermore, the ten largest check drawers'[6] share of the total credit portfolio of the public companies averaged about 17 percent during the period.[7]

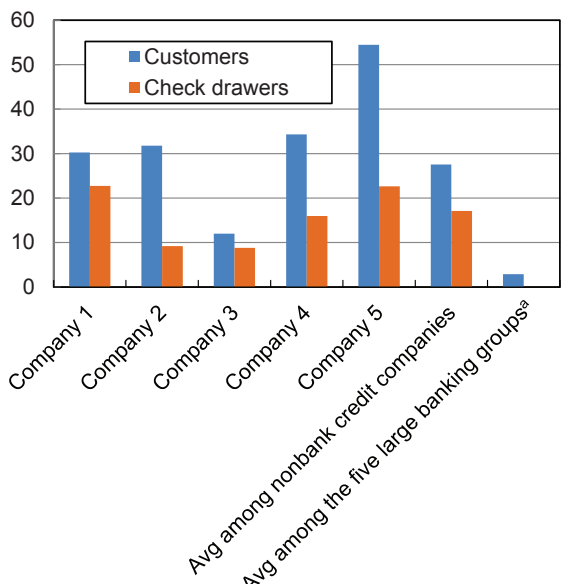
It should be noted that both the industry distribution and the customer and withdrawer distribution may change significantly from one period to another, because in most cases, the companies provide business credit for short terms.

Figure 1
The Yield of Unindexed Corporate Bonds, February 2016 to October 2017
(percent)



[a] With a similar duration to that of the bonds of the nonbank credit company.
SOURCE: Bank of Israel calculations.

Figure 2
The Ten Largest Customers and Ten Largest Check Drawers As A Share of The Total Credit



[a] The large borrowers excluding banking corporations.
SOURCE: Based on published financial statements.

6 Those writing the checks that the borrowers endorse to the credit companies during discounting.

7 At a few companies, self-issued payments account for a considerable part of the credit portfolio, leading to partial overlap between the customers and their check drawers.

5. Conclusion

The foregoing survey shows that the regulatory changes—particularly possibility given to the credit companies at the end of 2015 to raise capital by issuing bonds—alongside businesses' demand for liquidity allowed the nonbank credit market to expand and credit volumes in that market to grow. Moreover, there is evidence that it has the potential to expand even more. In recent years, institutional investors bought shares in a number of credit companies (the institutional investor is even the controlling owner in one of the large credit companies), and it seems that they are of the opinion that the market will continue expanded. Moreover, this cooperation may increase, providing the companies with another significant source of financing for their operations and for further expansion.

The growth of the nonbank credit industry, and its potential for further growth, will contributed to increased competition in the financial system, but will also require continued monitoring. With that, the public companies still provide only a little credit compared with the banking corporations and the institutional investors, and the volume of debt they owe the banks and the public remains relatively low. As such, at this stage, the nonbank credit industry cannot be seen as a source of macroprudential risk.

Box 2
Overlapping credit portfolios and multiple lending in the Israeli banking system

Konstatin Kosenko and Noam Michelson

- The banks' credit portfolios are liable to contain overlapping credit as a result of exposure to joint borrowers. This phenomenon creates a channel of linkage through which a shock that is unique to a particular bank may propagate to other banks and become systemic.
- The Israeli banking system does not have a significant volume of intentional overlap (syndication transactions), with most of the overlap being unintentional (de-facto syndication). Such overlap is created, inter alia, due to the regulatory limits of a single bank's exposure (restricted exposure to a borrower, group of borrowers, or industry), since the regulations force borrowers with large credit needs to borrow from a number of banks.
- The likelihood that a bank will provide credit to a borrower that has received credit from other banks increases with (a) the extent of the bank's interaction with the borrower's business, whether through existing loans to a group of borrowers to which the borrower belongs, or through acquaintance with the industry in which the borrower operates, and (b) the extent of overlap between the bank's asset portfolio and the asset portfolio(s) of the other lending bank(s).
- An analysis of the data on large credit exposures between 2005 and 2015 shows that while the extent of overlap between the banks' credit portfolios in Israel has declined, it remains significant.

1. Introduction

Since the Bank of Israel's mission includes the support for financial stability, the Financial Stability Division at the Bank of Israel monitors the relationships between the large financial institutions in the economy, which have the potential to act as channels for the propagation and strengthening of risks and for converting them into systemic risks. This box examines the indirect relationships in the Israeli banking system between 2005 and 2015, based on quarterly reports of large credit exposures that the banks are required to send to the Banking Supervision Department.

There are two types of relationships that may turn an idiosynchratic shock into a systemic shock—direct relationships and indirect relationships. The direct relationships (direct exposures) are created between two or more financial institutions through an asset held by one that is a contemporaneous liability for another, such as an interbank loan, and the research dealing with such relationships focuses on their implications for financial stability (Allen and Babus, 2009; Gorton and Metric, 2012; Giglio, 2013). This is because if the borrowing financial institution has difficulty repaying the loan or meeting any other liability toward the lender, the lending institution experiences difficulties in meeting its liabilities toward another bank or institution in the system, and so forth. The intensity of the shock and the speed with which it becomes systemic depend on the volume of mutual exposure and on the leverage of the institutions involved in that chain of inter-institutional exposures (Duffie, 2011; Kallestrup et al., 2011; Diebold and Yilmaz, 2011). The existing data show that in Israel, the volume of direct exposure among the banks is in a downward trend (net indebtedness declined from NIS 26 billion in 2011 to NIS 12 billion in 2016).

The indirect relationships (indirect exposure) are created when a number of financial institutions hold the same assets or group of assets on their balance sheets, meaning when they are exposed to a common asset. These relationships also contain a prudential risk.

a. What is the risk in overlapping portfolios?

The evolution of risk is widely discussed in Caccioli et al. (2014) and in Greenwood et al. (2015). They describe a process in which a bank deals with an idiosyncratic shock by selling assets intended to minimize its leverage (deleveraging).[1] According to these studies, if deleveraging takes place during a crisis, when there is little liquidity due to a limited supply of buyers, the sale of assets may be accompanied by an erosion of their value. If there are other investors who also hold those assets, they will be impacted by the erosion, and they may also be swept into the circle of deleveraging. Such fire sales may cause a spiral of liquidations of assets and a collapse of their prices in the entire financial system (Shleifer and Vishny, 2011). The answer to the question of whether, and at what speed, the shock intensifies to the point of impacting the entire system depends on the extent of overlap between the asset portfolios, the intensity of the initial shock, the volume of assets being sold in the entire system and the number of entities holding those assets, the negative impact to the price of the assets being sold, and the volume of exposure to assets with declining prices. Another negative effect of overlapping portfolios was found by Blei et al. (2014), who show that the level of overlap in the system is negatively correlated with GDP growth.

b. Why are overlapping portfolios created?

Every bank strives to diversify its asset portfolio in order to reduce its exposure to risk, but decisions on the optimal diversification at the bank level may lead to a situation where similarity is created in asset portfolios at the system level—a phenomenon that increases the risk in the system as a whole (Wager, 2011). The likelihood of this increases markedly if the banks use a similar risk assessment methodology or if the market offers few investment alternatives (Wagner, 2010; Ibragimov et al., 2011).

Acharya (2009) claims that the similarity between the institutions' asset portfolios may also be a result of a conscious decision to adopt a herding strategy with the objective of creating a situation of "too many to fall"). Haiss (2010) also views the similarity between asset portfolios as an expression of herding behavior, and argues that the source of this phenomenon is incentives that encourage the banks to make investment decisions that maximize their return without taking into account the negative external effects on the entire system. Acharya and Yorulmazer (2008) argue that herding behavior may develop in response to information asymmetry.

From a practical standpoint, an overlap between asset portfolios is created through one of two ways: (a) as a result of cooperation between institutions within syndication transactions—which by definition create overlap in asset portfolios ; or (b) when lending to borrowers who have an existing loan with other banks (de-facto syndication). As opposed to de-jure syndication, there is no coordination, information sharing or joint risk monitoring between the lenders in the second instance.

In terms of syndication loans, it is worth noting that Nirei et al. (2016) show that they act as an accelerant to the transmission of shocks from one back to another and to the system as a whole. Cai et al. (2014) use

[1] The likelihood that the bank will adopt such a strategy increases as the capital balance it requires to meet capital adequacy requirements declines. If it has a sufficiently large profit buffer, it will prefer to deal with the shock through that buffer and not by realizing assets.

a database of syndication loans in the US to create an index of linkage between banks, and find that this index is positively correlated to both the extent of systemic risk of a given bank and to the extent of risk in the entire system. Gong (2014) examines the pricing of syndication loans and shows that the lending banks sometimes—and particularly if they are small banks—properly assess the systemic risk of the borrowers. He finds that the banks derive benefit from the possibility of being similar to each other. They create a situation of "too many to fall", thereby lowering the risk of failure.

Since the phenomenon of syndication has only existed in Israel for a few years[2], we can attribute the overlap in the Israeli banking system to de-factor syndication.

2. Overlapping portfolios in the Israeli banking system

a. Data sources

The data we use in this box are taken from the quarterly reports of large credit exposures that the banks are required to provide to the Banking Supervision Department since 2005.[3] The reporting floor is flexible, and set according to the bank's capital, but the report must include at least 25 percent of the bank's total credit risk. In addition, the banks are required to report on total exposure to borrower groups if at least one company in the group exceeds the reporting floor.[4]

b. Descriptive statistics: Large credit exposures in the Israeli banking system

The database is comprised of reports on large credit exposures that the seven banks in Israel sent each quarter between 2005 and 2015 (44 quarters), and includes 304,843 loans (about 7,000 loans per quarter on average) to 19,273 individual borrowers, 536 of which are public companies.

The banks' credit portfolio accounts for about two-thirds of their total balance sheet during the period, and about half of it appears in the reports on large credit exposures (Figure 1). Figure 1 shows that in recent years, the banks have narrowed their exposure to particularly large borrowers, in accordance with Banking Supervision Department directives.[5] At the beginning of the period, the large credit exposures (in terms of balance-sheet credit[6]) accounted for 48 percent of the total credit portfolio of the banks. At the end of the period, it accounted for 41 percent.[7] However, the number of borrowers in the reporting is in a steady increase,

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2 Mainly is derives from the fact that the Banking Supervision Department increased the capital adequacy requirements (see the discussion on interconnectedness in this report).

3 Directive 810d "Quarterly Report on Large Credit Exposures" and Directive 810e "Quarterly Report on Credit Exposures", The directives are available (in Hebrew) on the Bank of Israel website at:
http://www.boi.org.il/he/BankingSupervision/SupervisorsDirectives/Lists/BoiRegulationReportOrders/810d.pdf
http://www.boi.org.il/he/BankingSupervision/SupervisorsDirectives/Lists/BoiRegulationReportOrders/810e.pdf

4 A full listing of the variables can be found in the aforementioned reporting directives.

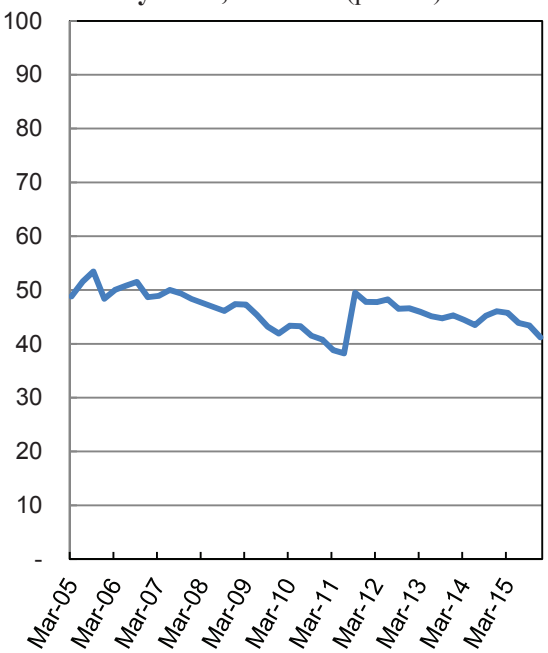
5 See, for instance, Bank of Israel (2016), "Israel's Banking System: Annual Survey, 2015". It is worth noting that borrowers belonging to the category of "Particularly large borrowers" are included in the report on large credit exposures, but this report also includes borrowers that do not belong to the category of "large borrows" at all.

6 It is more correct to use balance-sheet credit risk, since alongside balance-sheet credit, it also includes investments in the borrower's securities and liabilities in respect of OTC derivative transactions. However, we did not deduct these items since it is not possible to separate between provisions and write-offs made in respect of them and provisions and write-offs made in respect of balance-sheet credit. Therefore, we were unable to isolate the balance-sheet credit after write-offs and provisions. In any case, balance-sheet credit accounts for the vast majority (96 percent) of balance-sheet credit risk.

7 It should be remembered that the rate at the end of the period is lower than the rate at the beginning even though the reporting floor was lowered in the second half of 2011, leading to an increase in the number of borrowers.

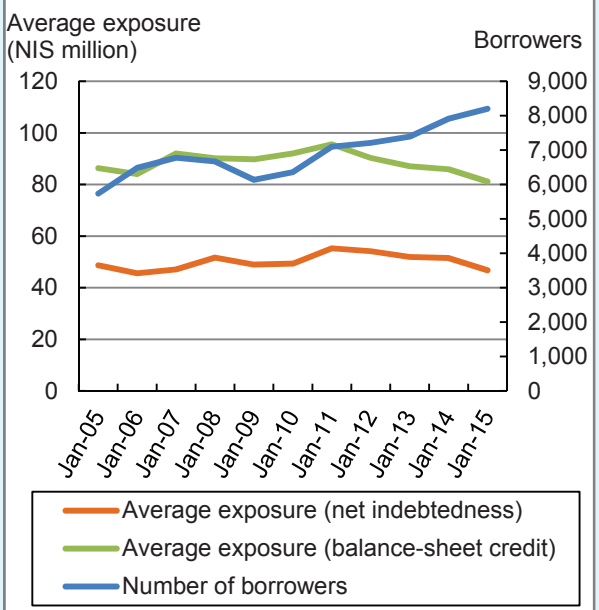
and average exposure did not change much during the period, ranging around NIS 50 million in terms of balance-sheet credit, and around NIS 90 million in terms of net indebtedness (Figure 2).

Figure 1
Large Credit Exposures as a Share of the Credit Portfolio, Entire System[a], 2005–15 (percent)



[a] The jump in mid-2011 is a result of the fact that the reporting directives were changed beginning in that quarter.
SOURCE: Bank of Israel calculations.

Figure 2
Number of Borrowers and Average Exposure[a], 2005–15



[a] Number of borrowers–Borrowers reported on, by all banks, in reports on large credit exposures;
Average exposure (net indebtedness)–Average net indebtedness of each borrower; Average exposure (balance-sheet credit)–Average balance-sheet credit of each borrower.
SOURCE: Bank of Israel calculations.

c. Descriptive statistics: The overlap between large credit exposures

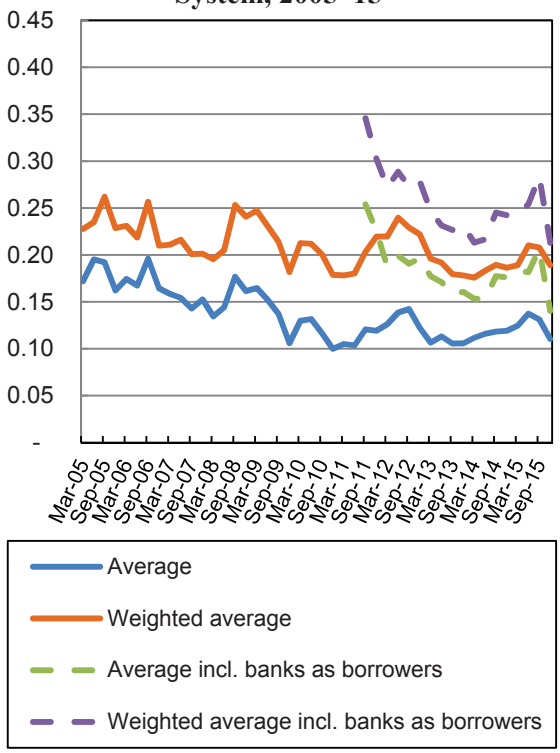
As the foregoing discussion shows, the portfolio of large credit exposures in Israel takes up a sizeable portion of the overall credit portfolio—the banks' main asset. Therefore, the extent of overlap between the large exposures shed light on the extent of overlap between all of the banks' assets.[8] In other words, the existing database (large exposures) makes it possible to examine the extent of overlap between the large exposures, and such an examination also sheds light on the extent of overlap between all of the credit portfolios of the Israeli banks. However, it is important to analyze the overlap between the large exposures because this is an illiquid asset that has a great potential to create a systemic effect.

The individual data show that there is an overlap between the banks as a result of exposure to joint borrowers. In order to identify the scope, we examine the correlation coefficient between the credit portfolios of all

[8] The overlap between securities portfolios held by institutional investors in Israel is discussed in Chapter 4 of the bank of Israel Annual Report for 2012.

bank pairs in the system. In particular, we examine the portfolio that combines all borrowers in each pair of banks, and calculate the share of net indebtedness of each borrower in the credit portfolio of each bank.[9] We calculate the correlation coefficient between each possible pair, so that each bank receives six correlation coefficients each quarter. Their, weighted (by total assets) average, shows the extent of total overlap of each bank relative to the other banks in the system. In order to show the extent of system-wide overlap, we calculated the quarterly correlation coefficient of the seven individual correlation coefficients, according to the simple average and according to the weighted average (Figure 3).[10]

Figure 3
The Average Correlation Coefficient in the Entire Banking System, 2005–15



SOURCE: Bank of Israel calculations.

The figure shows that at the beginning of the period, there is a relatively large correlation, meaning a relatively high level of interconnectedness, between the credit portfolios of the banks. The weighted average is 0.23 and the non-weighted average is 0.17. At the end of the period, the interconnectedness in the system was 0.19 for the weighted average and 0.11 for the non-weighted average (excluding bilateral exposure among the banks). The simple average declined more than the weighted average due to chances in the individual correlation (level of interconnectedness) of each bank, since the correlation of the large banks declined more moderately than the correlation of the small banks. Adding the bilateral exposure among the banks increases the correlation, which shows that the banks have a similar composition of exposure.

3. The causes of certain overlaps (and not others): Empirical Analysis[11]

A look at the large credit exposures at the banks, focusing on the overlapping portfolios, leads to a number of findings regarding the question of why certain overlaps are created and others are not. Before we present those findings, we note that there is a high level of variance in the level of exposures between the various banks. We also note that the overlap that is created when a person borrows from a number of banks has to do, inter alia, with the regulatory restrictions on an individual bank, which force borrowers with large credit needs to borrow

[9] A borrower at one bank who is not a borrower at the second receives the value of 0 at the bank in which he is not a borrower.

[10] In mid-2011, a reporting requirement was added for the volume of overlap between the banks and themselves, creating a break in the series. We therefore show the series that includes the banks as borrowers alongside the series that does not include them (the series with no break).

[11] Based on Kosenko K. and N. Michelson (forthcoming), "Just Two to Tango? The Multiplicity of Lenders and Overlapping Credit Portfolios", Bank of Israel, Discussion Papers Series.

from additional banks[12] since the original bank cannot increase credit to those borrowers.

Assuming that a borrower requests credit from additional banks, what are the characteristics of the additional bank with which the borrower will in the end associate? We found that the likelihood of being the additional bank increases if the bank specializes in providing credit to the industry in which the borrower operates, and if the bank has close credit relations with the group of borrowers with which the borrower is affiliated. Interactions between the economic size of the borrower and of the lending bank, supervisory expenses on the part of the lending bank relative to the size of the borrower, and the extent of overlap between the bank and the bank in which the borrower has existing loans also increase the likelihood. Therefore, we conclude that alongside the standard elements that affect the choice of new borrowers, the lenders' love for correlation also has a significant effect on it, and therefore affects the level of overlap in the system and the level of risk inherent in it.

The analysis also showed that prior connections between the borrower and the bank (past loans) reduce the likelihood of obtaining additional credit.

4. Conclusion

This box examined the overlap between the banks' credit portfolios, since it creates a channel of interconnectedness through which a unique shock to an individual bank may propagate to other banks and become systemic. The study was based on large credit exposures, and we found that the level of overlap in the banking system declined during the reviewed period (2005–2015), but that it remained significant. The overlap between the credit portfolios was created as a result of the multiplicity of lenders for a single borrower. The likelihood that a bank will provide credit to a lender who received credit from other banks increases with (a) the extent of the bank's interaction with the borrower's business, whether through existing loans to a borrower's group in which the borrower is a participant, or through acquaintance with the industry in which it operations, and (b) the extent of overlap between the bank's asset portfolio and the asset portfolios of the other banks. Understanding measuring the channel of interconnectedness created as a result of overlapping credit portfolios enables the Bank of Israel to improve the existing stress tests and to also examine the mutual effects derived from it.

[12] This situation is preferable to a situation in which there is no restriction on individual borrowers, since the risk of overlapping portfolios is secondary in importance to the risk of an individual borrower.

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Box 3
Investment in housing and in the capital market: A comparison from an historical perspective

Orr Yidov

- In the past decade, investments in housing have generated higher returns than investments in the capital market.
- However, if we look at investment performance in the various channels from a long-term perspective, we find that in the past three decades (1988–2017), investments in equities generated higher average returns than parallel investments in housing or in government bonds.[1] This result remains in place even after taking into account the costs involved in investing in the various channels.
- It is important to emphasize that investment in a dwelling differs in many ways from investments in the capital market, including the extent of liquidity, diversification ability, the level of leverage, the transaction and maintenance costs, taxation terms, the correlation with the returns on other assets, and more. These characteristics also have an effect on investment decisions.

Background

Since 2008, prices in the housing market have increased rapidly, accompanied by a rapid increase in the volume of mortgages. In order to reduce the upward pressure on prices, policymakers have in recent years adopted measures aimed at investors in the housing market, including increasing the tax conditions imposed on them, with the aim of reducing the attractiveness of the investment.[2] These have led to a decrease in the proportion of investors in the total amount of purchase transactions, from more than one-quarter in 2014–15 to 17 percent in 2017.[3] Price increases, the low interest rates on mortgages, and the low returns in other investment channels have put the question of whether investing in a dwelling is preferable to investing in the capital market on the public agenda.

A study by Mehra and Prescott (1985)[4] serves as a milestone in the literature on the differences between various investment channels. The researchers estimated the risk premium on an investment in equities relative to an investment in short-term low-risk debt, and examined whether it could be explained by the Arrow-Debreu model of general equilibrium. They found that between 1889 and 1978, the average premium on an investment in the S&P 500 index was 6.2 percent, a result that was not consistent with the model, since it is much higher than the model expects. In a later study, Dimson, Marsh and Staunton (2016)[5] focused on 17 countries between 1900 and 2005, and found a that the average premium was lower, but still "too high"—4.7 percent relative with the yield on short-term government bonds.

1 See Figure 7.

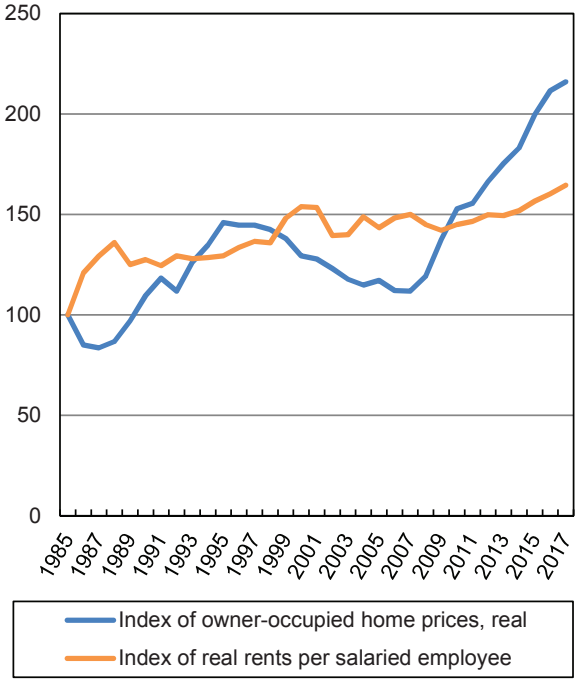
2 In 2014, the exemption from betterment tax for investors who sold a dwelling four or more years after their previous sale was cancelled. In 2015, the purchase tax for investors was increased, and in 2016, the period in which those upgrading their home are entitled to own two homes and obtain an easement on purchase tax was shortened from two years to one-and-a-half years.

3 Including dwellings purchased by nonresidents. See Figure 2.

4 Mehra, R. and E. C. Prescott (1985), "The Equity Premium: A Puzzle", *Journal of Monetary Economics* 15(2), 145–161.

5 Dimson, E., P. Marsh, and M. Staunton (2006), "The Worldwide Equity Premium: A Smaller Puzzle", in R. Mehra (Ed.), *Handbook of the Equity Risk Premium* (pp. 467–514).

Figure 1
Development of Home Prices and Real Rents in Israel, 1985–2017 (percent)



SOURCE: Central Bureau of Statistics.

Figure 2
Investors as a Share of Total Housing Transactions[a], 2003–17 (percent)

[a] The number of purchases made by local and nonresident investors as a share of total purchases made over the year.

SOURCE: CARMEN database.

Knoll, Schularick and Steger (2016)[6] examined how home prices developed in 14 advanced economies between 1870 and 2010, and found that from the middle of the 19th century until the middle of the 20th century, prices remained constant in real terms, but that in the following decades, they increased sharply. This increase was a result of an increase in residential land prices, and this was found to be the main factor in determining home prices over the long term.

In the most up-to-date study in the field, Jorda et al. (2017)[7] compared the historical returns on investments in equities, government bonds and housing, in a comparison that encompasses 16 advanced economies over the course of 146 years (1870–2015). They found that investments in housing and in equities generated similar average real returns during the period—7 percent and 6.9 percent respectively—while investment in government bonds generated a much lower average yield of 2.5 percent. They also found that in later periods, equities generated significantly higher returns than housing—8.3 percent compared with 7.4 percent since 1950, and 10.7 percent compared with 6.4 percent from 1980 onward. The equity channel showed much higher volatility than the other channels in all periods.

We will concentrate on Israel, and examine the differences between investment in housing and investment in the capital market, relating both to return and risk aspects and to other aspects of the characteristics of

6 Knoll, K., M. Schularick, and T. M. Steger (2016), "No Price Like Home: Global House Prices, 1870–2012", *The American Economic Review* 107(2), 331–353.

7 Jorda et al. (2017), "The Rate of Return on Everything, 1870–2015", NBER Working Paper 24112, National Bureau of Economic Research.

the investments. We focus on the period from 1988 to 2017, and compared investments in housing with investments in the Tel Aviv 125 index[8], the S&P 500 shekel index[9], and the general government bonds index.

1 . The considerations involved in investment decisions

This section discusses the various characteristics of investments in housing and in the capital market, and presents in brief the main advantages and disadvantages in each of the channels. These advantages and disadvantages have a material effect on investment decisions, together with return and risk—aspects that will be discussed in the next section.

The advantages of investment in housing over investment in the capital market

On-going income: Investment in an income-producing dwelling generates a fixed and relatively stable income, resulting from the rent paid by the tenant each month throughout the rental period (if the dwelling is rented and the tenant meets his obligations). Investment in equities generates on-going income (dividends) that is less stable, since its source is in cash flows from the operations of the issuing entity, and payment depends on the company's profitability and its preparedness to distribute a dividend to investors. While a capital market investor can generate on-going income through the exercise of assets in fixed equities, this involves transaction costs and generally requires the active involvement on the investor, as opposed to rental income.

Correlation with other assets: Home prices and the prices of financial assets are generally weakly correlated (and sometimes negatively correlated). As such, if we include housing and financial assets in the investment portfolio, thereby diversifying the portfolio, it may reduce the overall risk of the portfolio and maintain a more stable rate of return even in periods when the capital market shows weak or volatile performance. Jorda et al. (2017) found that between 1870 and 2015, the moving 10-year correlations between the returns on housing and the returns on equities are between -0.1 and 0.6. We found the following overall correlations between the monthly returns in the various channels:

Correlations between the monthly returns on investments in housing and the capital market, 1988–2017

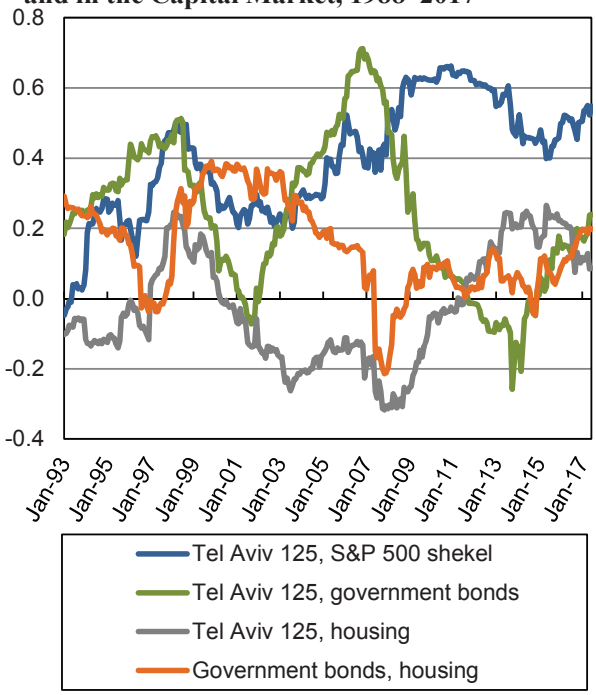
	Tel Aviv 125	S&P 500 shekel	General gov't bonds	Housing
Tel Aviv 125	1			
S&P 500 shekel	0.31	1		
General gov't bonds	0.22	0.12	1	
Housing	-0.05	0.03	0.18	1

8 Until February 2017, the Tel Aviv 100 index.

9 The multiplier of the total return index by the shekel/dollar exchange rate. This includes the effect of changes in the exchange rate on the value of the investment.

When we examined the moving 5-year correlations between the monthly returns on housing and the returns on the capital market as well, we found that there generally is a low correlation between investment in housing and investment in financial assets (Figure 3).

Figure 3
The Moving 5-Year Correlation Between Monthly Returns on Investments in Housing and in the Capital Market, 1988–2017



SOURCE: Based on Tel Aviv Stock Exchange and Central Bureau of Statistics.

Leverage: When a typical investor takes out a mortgage to purchase a dwelling, he essentially significantly leverages his equity, and is thereby able to obtain an improved return on the investment. That investor will have difficulty borrowing a similar volume under similar terms in order to purchase securities, since securities serve as a less stable collateral for the lender. For that reason, the interest rate on credit to finance an investment in the capital market is higher than the interest rate on mortgages. Leverage becomes even more attractive during periods in which the interest rate is low and brings down the cost of financing the investment. But it is important to remember that leverage brings with it an increase in the risk level of the investment, and it is therefore unclear whether the possibility of leveraging is an advantage—it depends on the investor's risk preferences.

Psychological aspects: Some investors may derive psychological benefit from investment in a dwelling, for instance through a sense of security and certainty due to ownership of a physical asset, or because their acquaintance with the characteristics of the asset is better than their acquaintance with the characteristics of assets traded on the capital market.

The advantages of investment in the capital market over investment in housing

Transaction costs: The purchase or sale of a dwelling generally involves heavy transaction costs. These mainly include legal fees (about 1 percent of the value of the transaction), searching costs (in a purchase—looking for a dwelling; in a sale—looking for buyers), and in many cases agency fees (1–2 percent of the value of the transaction). In addition, purchase tax must be paid at the time of the purchase (for a more in-depth discussion see below). In contrast, transaction costs in the purchase or sale of securities include purchase or sale commissions, which are paid at rates that differ for each transaction and are generally significantly lower than housing transaction costs.

Since a housing transaction involves high expenses and purchase tax, it is generally not worthwhile to invest in housing for the short term. The effect of the one-time expenses on the net return dissipates the longer the duration of the investment is and expenses are spread out over many more years. Investments in the capital market involve much lower transaction costs, and may therefore be worthwhile in the short term as well.

Holding costs: Investment in a dwelling involves significant holding costs, including depreciation and maintenance, renovation, insurance, and costs derived from the need to find tenants over the investment period. Investing in the capital market entails significantly less holding costs, mainly various management fees and handling commissions at varying rates.

Non-rental risk: An investor in a dwelling may have difficulty finding tenants, and suffer a loss of return during periods in which the dwelling lacks tenants. Moreover, during such periods, the investor himself will have to bear the costs generally imposed on tenants (such as municipal tax and building committee payments). The difficulty in finding tenants varies according to the characteristics of the various dwellings and areas, and generally increases with the distance from high-demand areas. An investor in the capital market is not exposed to such risk.

Liquidity: While the purchase and sale of securities are relatively rapid and simple, the process in the housing market is cumbersome and involves significant costs and time resources. Moreover, investments in securities can be realized in part, according to the needs of the investor, while investment in a dwelling can generally be realized only in whole. Therefore, investment in the capital market offers higher levels of tradability and liquidity, and from this standpoint is preferable (we would basically expect to find an illiquidity premium on investment in a dwelling).

Minimal capital: The price of a typical dwelling is much higher than the prices of most financial assets. Therefore, investment in the housing market requires much greater initial capital than investment in the capital market.

Diversification: A capital market investors can easily diversify his investment by investing in a large number of assets and financial instruments from various markets and industries, thereby reducing the risk level to which he is exposed without negatively impacting the expected return from the investment. In contrast, the typical housing investor must invest a large amount in a single asset. He can therefore generally purchase one or, at the most, a small number of dwellings. He is therefore much more limited in his ability to diversify the investment, and is greatly exposed to events in the housing market. Moreover, investment performance is solely dependent on the particular dwelling he owns, which may differ from the average in the housing market and even suffer from greater volatility (to borrow a term from the capital market. This is similar to investment in a single equity compared with a diversified investment in a varied composition of assets). From this standpoint, investment in a dwelling is more risky. This risk is not reflected in the data that will be presented below, which are derived from home price and rent indices, and therefore represent diversification over all dwellings in the market, even though actual diversification is not possible in a direct investment in housing.

Taxation aspects

Taxation on current income: Taxation terms on current income from investment in a dwelling—rental income—are more lenient than the taxation terms on current income from securities (dividends on equities and interest payments on bonds). While rental income is largely exempt from tax[10], current income in the capital market is taxable at a uniform rate of 25 percent of the real profit from the first shekel (other than unindexed bonds, which are taxed at 15 percent of the nominal profit). From this standpoint, investment in a dwelling has an advantage over investment in securities.

Capital gains tax: When selling a dwelling, the sellers pay betterment tax of 25 percent of the real profit (the difference between the sale price and the purchase price, minus purchase and betterment expenses). When realizing an investment in the capital market, investors pay a capital gains tax of 25 percent of the real profit (15 percent of the nominal profit in the cast of unindexed bonds). Form this standpoint, there is no difference between housing and the capital market. However, those owning a single dwelling are exempt from betterment tax, which provides an additional taxation benefit for investing in a dwelling when the investors do not own another dwelling (for investment or residence).

Purchase tax: Those purchasing an investment dwelling must pay purchase tax of 8 percent of the purchase price, up to a ceiling price of NIS 4.97 million, and a marginal rate of 10 percent beyond that.[11] In contrast, those purchasing a single dwelling are exempt from paying purchase tax up to a ceiling of NIS 1.62 million, and must pay a marginal tax in increasing brackets beyond that.[12] Capital market investors are not required to pay any tax at the time of purchase, with tax applying to the profits only. From this standpoint there is an advantage to investing in the capital market (unless the comparison is to purchasers of a single dwelling with a price below the tax threshold). The shorter the investment duration, the more significant this advantage becomes. To illustrate, for a two-year investment, the purchase tax consumes the entire return from rental income (assuming it is 3-4 percent per year; see the table in the Appendix).

Offsetting losses: Another tax advantage for the capital market involves the ability to offset losses from some investments against profits from others in the same year or in previous years, thereby minimizing tax indebtedness in respect of total profit. In contrast, a loss on an investment in a dwelling cannot be offset against profits from investments in other dwellings or assets (unless the income from the dwelling is classified as a business expense, which can be offset against profits from other sources).

2. Comparing returns from investments in housing and in the capital market

This section compares the performance of investments in housing and in the capital market between 1988 and 2017. It shows the development of the value of the investments in different time segments, the returns that

[10] Rent of up to NIS 5,010 per month is completely exempt from income tax. Rent of up to NIS 10,020 is partially exempt. The taxable amount is taxed at the marginal tax rate applying on all of the landlord's income (but in any case is not less than 31 percent), and is calculated minus transaction and holding costs. Alternatively, the landlord can choose between two tracks to pay tax on all rental income: a reduced tax rate of 10 percent without excluding expenses, or tax at the marginal tax rate on all of the landlord's income minus transaction, holding and depreciation costs.

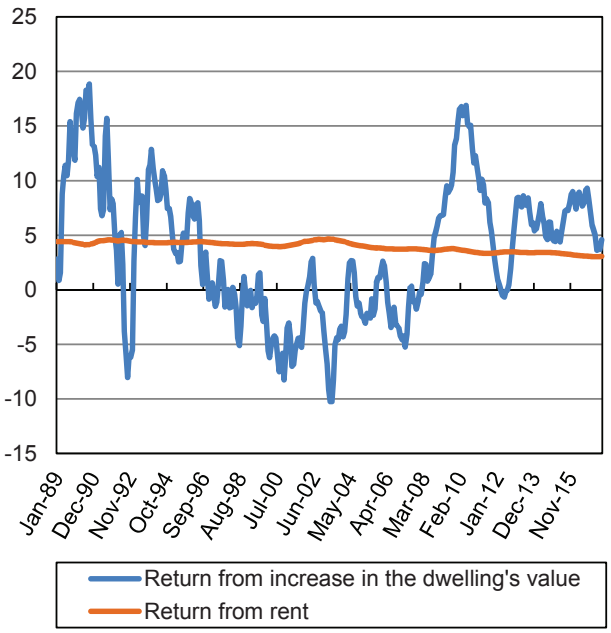
[11] The purchase tax for investors was increased in July 2015. Before that, it was 5–7 percent to a ceiling of NIS 4.64 million, and 8 percent for amounts in excess of the ceiling.

[12] 3.5 percent to a ceiling of NIS 1.93 million, 5 percent to a ceiling of NIS 4.97 million, 8 percent to a ceiling of NIS 16.56 million, and 10 percent thereafter.

they generated, and the levels of volatility that accompanied them.[13] In addition, we evaluate the costs inherent in investments in the various channels, in order to adjust for them and to estimate the net returns.

We calculated the return on an investment in a dwelling from the Index of Home Prices, the average price of a dwelling, and the average rent. These represent only the average dwelling, and we therefore will not be able to derive conclusions from them regarding the patterns of behavior of dwellings with specific characteristics concerning, for instance, the geographic location, age, or number of rooms. It is certainly possible that dwellings of a certain type will show much better or much worse performance than the average dwelling. An example of the differences between dwellings with different characteristics can be found in how home prices have developed in different areas since the beginning of 2007. Home prices in Gush Dan are 180 percent higher today than what they were then, while the increases in other areas were more moderate (120 percent in the south of the country, 140 percent in the north, and 150 percent in the center excluding Gush Dan).[14]

Figure 4
Components of Return on a Dwelling: Return from Rent and Return from Increase in Value[a], 1989–2017 (percent)



[a] The gross real returns from non-leveraged investments per year.
SOURCE: Based on Central Bureau of Statistics.

The return on an investment in a dwelling can be divided into two related components: the current return from rent and the return from the increase in the value of the asset between the purchase and the sale (capital gain). While rental proceeds are spread out over the investment period and are available to the investor for current use, the capital profit (or loss) is obtained upon the sale of the dwelling, and is not ensured until the date the investment is realized.

In order to calculate the return from the increase in value of the dwelling, we took the rate of change in the Index of Home Prices for owner-occupied dwellings over the investment period and deducted the change in the Consumer Price Index during the same period. In order to calculate the return from rents, we took the total annual rent proceeds (according to the average rent calculated by the Central Bureau of Statistics)[15] and divided it by the current value of the dwelling (according to the average home price calculated by the CBS).

[13] In order to create a uniform basis for comparison between the channels, we calculated the returns assuming that equity is the only source for investments, even though investors in dwellings generally use a mortgage. Leveraged investments (including the purchase of a home with a mortgage) may generate returns that are higher than those presented below, but they involve higher risk.

[14] According to median nominal prices for dwellings of 1.5–5 rooms. Data from the Carmen file.

[15] The data are not available prior to 1998. In order to obtain an estimate of the average rent between 1988 and 1997, we concatenated the 1998 data according to the Index of Home Prices (which reflects the cost of housing services based on rental contracts).

Over the reviewed period, the real return from rent ranged in a relatively stable range of between 3 and 4.6 percent.[16] In contrast, the return from an increase in the value of dwellings showed much greater volatility (Figure 4).

We now compare the performance of investments in various channels over a number of periods. In order to calculate the returns in the capital market, we used equity and bond indices calculated on the assumption that current income (interest or dividend proceeds) is reinvested in the index. In order to create a valid comparison between the channels, we assume that rent proceeds are also fully reinvested, in this case in the return on the dwelling in the following periods. Assuming that rent is received once per month and reinvested at the end of that month, the index of the overall value of the investment in a dwelling is calculated as follows:

$$V_t = V_{t-1} * (\frac{P_t}{P_{t-1}} + R_t)$$

where V_t is the total value of the investment in month t, P_t is the price of the dwelling in month t, and R_t is the monthly return from rent in month t. In this context, it should be noted that reinvestment of the current income from the dwelling is less practical than reinvestment in the capital market, and means the purchase of "dwelling parts" from rent proceeds, or their investment in the renovation of existing assets.[17]

We first look at investments that were made in January 1988, and examine the cumulative gross real returns in the four channels on which we focused (Figure 5). In this view, investment in the Tel Aviv 125 index achieved the highest return, investments in a dwelling and in the S&P 500 achieved similar returns, and government bonds generated the lowest return. However, we cannot draw general conclusions from this result regarding returns in the various channels, since it is specific and depends on the fact that we selected 1988 as the starting point. If we look, for instance, at the cumulative gross real returns from investments beginning at the start of 2017, prior to the global financial crisis, we obtain significantly different results—as shown in Figure 6.

This time we see that the equity indices absorbed a serious hit at the beginning of the period, and until the beginning of 2009 they lost close to have of their starting value. In contrast, the value of an investment in a dwelling increased rapidly during the period, and within a decade it was 2.7 times as high as its initial level. The increase in home prices took place following a decade of real price declines, and is explained, inter alia, by the shortage that developed due to the lack of building starts and the fact that the interest rates in Israel and globally were lowered to historic lows during the period. The low interest rates helped the process from two directions—it lowered the cost of interest payments on mortgages, and also reduced the alternative returns in the bond markets—thereby increasing demand for dwellings as an investment product. These all pushed home prices upward, and made investment in dwellings at the beginning of the period much more worthwhile than investments in the other channels.

The difference between the results in Figures 5 and 6 show that they are very sensitive to the selection of the starting point and to the investment period. Such a view therefore does not show the full picture, and makes it difficult for us to compare the channels from a broad perspective. In order to make a broad comparison, we will relate to the average of the annual returns derived from investment in each channel, where the investment duration is fixed (5, 10, 15 or 20 years), but the investment start and end dates are variable at the monthly level

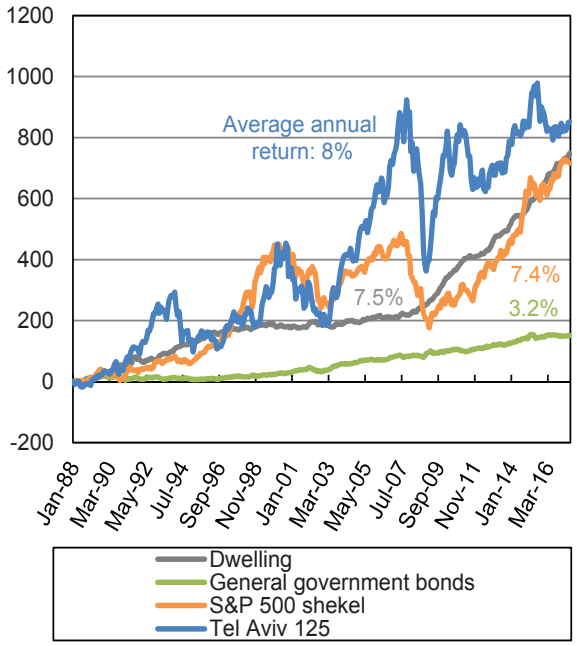
[16] Assuming that the dwelling is rented out continuously throughout the entire investment period. From this standpoint, this is an overestimation of the return from rents.

[17] Excluding the reinvestment of rental proceeds, the return on investment in a dwelling is lower than what is shown (for 10-year investments, the average real return is about 1.25 percentage points lower).

during the period (1988–2017). In this way, we calculate the average returns generated from investments at many dates, and obtain a more representative picture of the typical returns in each channel over the past 30 years (Figure 7).

Figure 7 shows that in all four periods, the ranking of the average returns generated by the channels remained

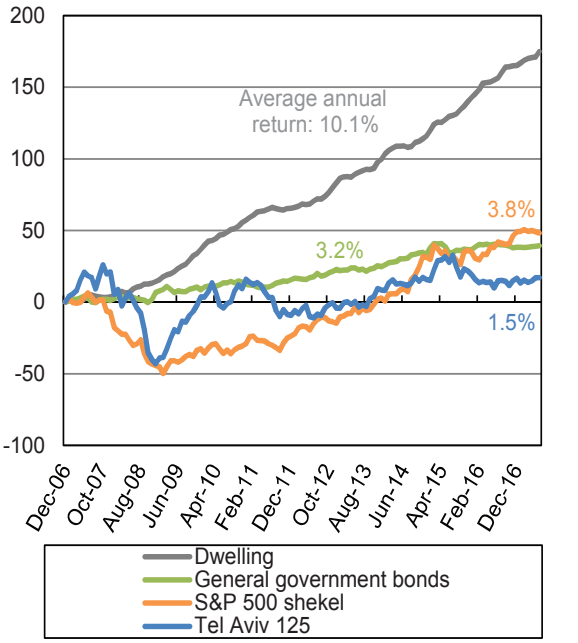
Figure 5
Cumulative Real Returns from Investments in Housing and in the Capital Market[a], 1988–2017 (percent)



[a] Assuming that the investments are not leveraged, and assuming tht the interest, dividend and rent proceeds are reinvested.

SOURCE: Based on Tel Aviv Stock Exchange and Central Bureau of Statistics.

Figure 6
Cumulative Real Returns from Investments in Housing and in the Capital Market[a], 2007–2017 (percent)



[a] Assuming that the investments are not leveraged, and assuming tht the interest, dividend and rent proceeds are reinvested.

SOURCE: Based on Tel Aviv Stock Exchange and Central Bureau of Statistics.

the same: The Tel Aviv 125 generated the highest return, investments in the S&P 500 and in dwellings generated similar average returns, and government bonds achieved the lowest returns. From this standpoint, the results bring to mind those obtained by Jorda et al. (2017) for the later periods: average returns on equities are higher than for housing, and both are significantly higher than returns on government bonds.

We also examine the extent of volatility involved in investments in each channel, according to the standard deviation of the returns they generated between 1988 and 2017.[18] As expected, investment in equities is much more volatile than investments in the other channels. The standard deviation of returns on the Tel Aviv 125 index is 20.9 percent and that of the S&P 500 index is 14.3 percent[19], while the standard deviations

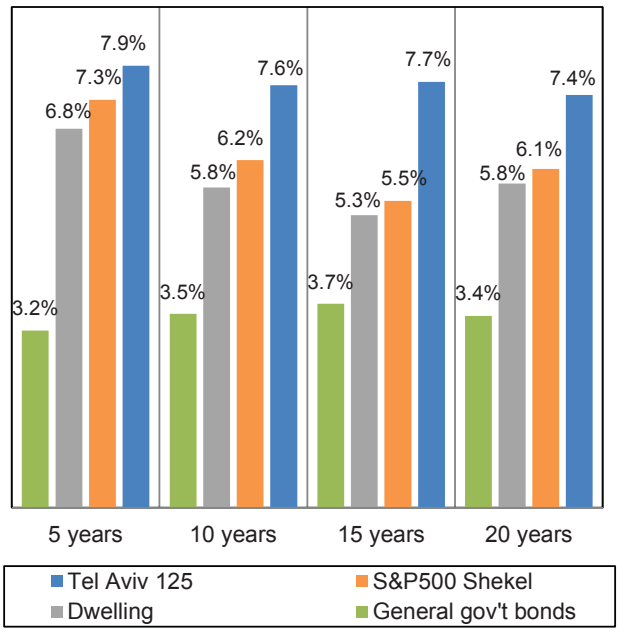
[18] We calculated the standard deviation from the monthly returns on the four channels, and converted the result to annual terms.

[19] As mentioned, we examined the S&P 500 index in its shekel version. The standard deviation of investment in this index is not derived only from the behavior of the source index, but also from changes in the shekel/dollar exchange rate. In practice, we found similar standard deviations in the returns on the dollar index and the shekel index, as well as similar average returns in all periods.

in housing and in the general government bonds fund are 4.4 percent. However, caution should be used in interpreting the standard deviation of returns on housing. As mentioned, we calculated those returns from the Index of Home Prices and the rental index, which average the returns of all dwellings in the market. Therefore, the result we show above does not properly reflect the volatility in the return on investment in a specific dwelling—it may be higher, with greater inherent risk due to low diversification.

The results above only reflect the average returns during the examined period, but it is interesting to also examine their development during the period and to identify trends. For this purpose, we look at the returns on 10-year investments in each of the four channels (Figure 8).[20] We can see that investments in dwellings generated lower returns than investments in the Tel Aviv 125 index over most of the period, and only investments in housing that ended from October 2013 onward consistently generated higher returns than the returns on the other channels. We can also see that the sharp upward trend in the return on a dwelling began with investments that ended during 2008, meaning at the beginning of the current cycle of home price increases. For earlier investments, the return on housing is higher than the parallel return on the Tel Aviv 125 in only 20 percent of cases, and it is lower than the return on the S&P 500 shekel index in all cases.

Figure 7
Average Gross Real Return from Investments in Housing and in the Capital Market[a] for 5, 10, 15 and 20 Years, 1988–2017



[a] Assuming that the investments are not leveraged and that interest, dividend and rental proceeds are reinvested.

SOURCE: Based on Tel Aviv Stock Exchange and Central Bureau of Statistics.

We will now try to estimate how the costs inherent in investments in the various channels (transaction, holding and tax expenses) affect the obtained returns. We look at investments of NIS 1 million for 10 years in three channels—the Tel Aviv 125 index, the general government bonds index, and dwellings according to the Index of Home Prices[21]—and deduct the costs from the gross returns that we found above in order to estimate the net real return in each channel.

Regarding securities, let us assume that (a) the purchase and sale commissions are 0.1 percent of the transaction value, and are collected only twice during the investment—at the beginning and at the end[22]; (b) annual management fees are 0.05 percent of the current value of the portfolio; and (c) capital gains tax is 25 percent

[20] At each point in time on the graph, the real annual returns on 10-year investments ending at that period in time are shown. For example, in January 2017, the returns on investments between January 2007 and January 2017 are shown.

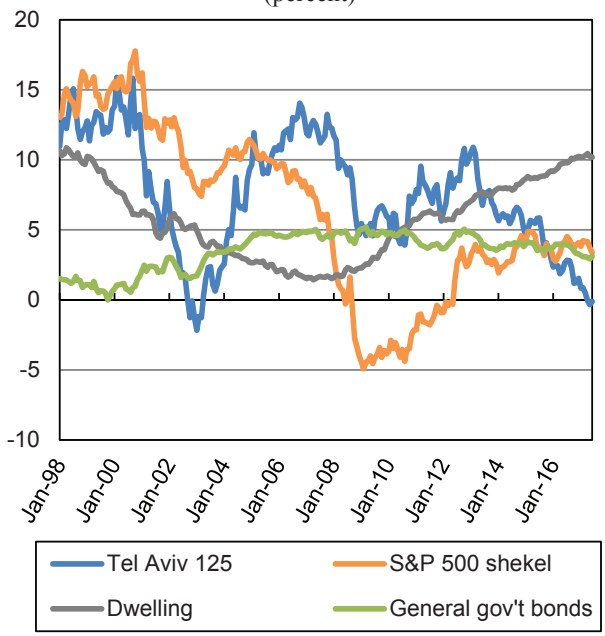
[21] This time, the S&P 500 index was not examined. The costs inherent in investment in that index may be slightly higher than the costs of investment in the Tel Avi 125 index, but are not materially different.

[22] According to trading fees in the four large investment houses in Israel.

of the real profit at sale. Regarding investment in a dwelling, let us assume that (a) purchase tax is 8 percent of the purchase price (the current base rate); (b) lawyer and agency expenses are 1.5 percent of the transaction value combined, and are paid twice—upon purchase and upon sale of the dwelling; (c) expenses for home maintenance and loss of rental during periods when the dwelling is unoccupied total two weeks rent per year combined; and (d) betterment tax is 25 percent of the real profit at sale, and rental income is tax exempt, since based on the average return from rent throughout the period, it is less than NIS 5,010 per month.

Under these assumptions, the following results are obtained (details in the appendix):

Figure 8
Real Returns from 10-Year Investments in Housing and in the Capital Market[a], 1988–2017
(percent)



[a] Assuming that the investments are not leveraged and that interest, dividend and rental proceeds are reinvested.

SOURCE: Based on Tel Aviv Stock Exchange and Central Bureau of Statistics.

Average annual return, gross and net, from a 10-year investment			
Investment channel	Gross real return	Net real return	Difference in percentage points
Tel Aviv 125 index	7.59%	6.06%	1.53
General government bond index	3.48%	2.66%	0.83
Dwelling	5.76%	4.87%	0.88

We see that even if the effect of the investment costs are weighted, the ranking of the channels by level of return remains the same. If we examine the difference between the gross and net returns in each channel, we find that the investment costs eroded the return on investment in equities in the most, while the returns on investments in government bonds and in housing were eroded less.

The net return on an investment in a dwelling shows the most sensitivity to the investment duration. The shorter the duration, the greater the effect of the transaction costs and purchase tax, and the lower the net return. For longer investments, the effect of the transaction costs diminishes, while the tax benefit on rental income becomes more significant. The net return on investments in the capital market is impacted less by the investment duration, due to lower transaction costs and fully taxed current income. As such, short-term investments show a greater gap between net returns on investments in equities and net returns on investments in housing.[23]

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To conclude, between 1988 and 2017, investments in equities for various terms generated gross and net returns that were higher than parallel investments in housing, and significantly higher than investments in government bonds. We note again that, as detailed in the first part of this box, the various investment tracks do not differ only in the returns they generate for investors, but also in other material characteristics, including tradability and liquidity, financing and leverage, diversification, taxation, and psychological aspects.

[23] To illustrate, we look at 5-year investments with identical gross returns. In this case, the net real return on a dwelling falls from 4.87 percent to 3.78 percent, while the net returns on equities and bonds change more moderately (from 6.06 percent to 5.82 percent on equities, and from 2.66 percent to 2.59 percent on bonds).

Appendix: Net returns on 10-year investments after transaction, holding and tax expenses*				
	Equities - Tel Aviv 125	Bonds - General government bonds index	Housing	Assumptions
Investment amount	1,000,000	1,000,000	1,000,000	
Transaction expenses				
Purchase and sale fees	3,079	2,408		0.1% of the transaction value at purchase and at sale
Purchase tax on a dwelling			80,000	8% of the purchase price [1]
Lawyer and agency expenses			32,624	1.5% of the transaction value at purchase and at sale
Holding expenses				
Securities management fees, per year	764	607		0.05% of the current portfolio value
Maintenance and loss of rent from an empty dwelling, per year			1,662	Rent for two weeks[2]
Taxation on current income				
Tax on rental income			-	0% [1][3][4]
Taxation on capital gains				
Capital gains / betterment tax	267,006	99,944	11,421	25% of the real profit on sale [1][5]
Total				
Real annual return, gross	7.59%	3.48%	5.76%	[6]
Transaction, holding, and tax costs for the entire period	277,728	108,417	140,663	
Real annual return, net	6.06%	2.66%	4.87%	
Difference between net and gross returns, in percentage points	1.53	0.83	0.88	

[1] Throughout the examined period, there were a number of changes in the purchase tax, the betterment tax and the capital gains tax. The data in the table are calculated assuming that the dwelling is a second dwelling under the current taxation terms.

[2] Assuming that there are no renovation or improvement expenses other than regular maintenance.

[3] Assuming that interest and dividend proceeds are reinvested, tax payments in respect of them are calculated at the end of the period as part of the capital gains tax.

[4] Full exemption on rent of less than NIS 5,010 per month.

[5] Transaction and holding costs are recognized for tax purposes.

[6] Average gross real returns on 10-year investments.

* The calculation ignores the discounting factor. Taking discounting into account makes investment in a dwelling less worthwhile than investment in securities, since when purchasing a dwelling, a larger portion of the expenses are paid at the beginning of the period, while tax expenses at the end of the period are greater than when investing in securities.

Main indicators of the stability of the financial system in Israel, 2013–October 2017
(percent)

	2013	2014	2015	2016	2017	Updated to
A. The global environment						
Global real GDP growth rate	3.4	3.6	3.4	3.2		12/31/2016
World trade growth rate	3.7	3.8	2.8	2.4		12/31/2016
Emerging Markets Bond Index (EMBI) spread[a] (periodic average)	3.2	3.3	4.2	4.1	3.3	10/31/2017
Chicago Board of Options Exchange VIX index (periodic average)	14.2	14.2	16.7	15.8	11.2	10/31/2017
B. The domestic environment						
Government debt to GDP ratio (end of period)	65.9	64.9	62.5	60.6	60.3	6/30/2017
Net external debt to GDP ratio (end of period)	-26.8	-36.3	-41.0	-42.1	-39.9	6/30/2017
Total private credit to GDP ratio (end of period)	113.5	111.8	110.1	110.6	111.4	8/31/2017
Business sector credit to business sector product ratio (end of period)	99.0	96.7	93.3	93.3	93.5	8/31/2017
Debt burden on households—the ratio of credit to households to disposable private income (end of period)	58.8	58.6	59.7	60.5		12/31/2016
Israel's sovereign risk premium (5-year CDS spread—periodic average)	1.2	0.88	0.73	0.79		
The differential between yields on 10-year unindexed government bonds and 10-year US Treasury Notes (periodic average)	1.5	0.4	-0.1	0.0	-0.30	10/31/2017
The corporate bond market spread—total bonds excluding financial corporate bonds (periodic average)	4.4	3.2	4.0	3.6		9/30/2016
C. Financial Assets						
Risk indices (periodic average)						
Implied volatility:						
of the exchange rate	11.5	10.8	10.3	12.7	11.4	9/6/2017
of the Tel Aviv 35 index[b]	17.5	15.7	20.0	21.2	17.3	2/9/2017
Actual volatility:						
of the exchange rate	6.2	5.3	8.1	5.8	5.6	10/31/2017
of the General Shares Index	8.9	9.1	13.1	12.8	9.3	10/31/2017
Prices and yields (annual terms)						
Rate of change of the shekel vis-à-vis the dollar (during the period)	-7.0	12.0	0.3	-1.5	-8.4	10/31/2017
Rate of change in the effective exchange rate (during the period)	-7.6	3.3	-7.3	-4.8	-4.2	10/31/2017
Rate of change in the General Shares Index (during the period)	15.3	11.5	6.8	-11.1	-5.5	10/31/2017
Yield to maturity on unindexed 5-year government bonds (periodic average)	2.5	1.7	1.0	0.9	1.0	10/31/2017
D. Resilience of the financial system						
The banking system[c] (end of period)						
Total core capital to risk components ratio[d]	14.7	14.2	13.9	14.7	14.5	6/30/2017
Core Tier 1 capital to risk components ratio[d]	9.7	9.6	9.9	10.9	10.8	6/30/2017
Ratio of annual loan loss provision to total balance-sheet credit to the public (multiplied by 100)	0.25	0.15	0.12	0.10	0.20	6/30/2017
Insurance companies (end of period)						
Initial capital as a share of total assets	5.7	5.6	5.4	4.5		9/30/2016
Risk assets as a share of nostro assets	42.6	44.0	45.4	43.9		10/31/2016
Provident funds[e] (end of period)						
Liquid accounts as a share of total liabilities	68.6	70.0	69.6	72.6	68.7	9/30/2017
Ratio of liquid assets to liquid liabilities	33.8	38.1	38.2	35.1	35.7	9/30/2017
E. Market liquidity						
Total trading volume in the markets[f] (periodic average, NIS billion)	4.7	4.7	4.7	4.2	4.2	10/31/2017
Spread between highest and lowest NIS/$ exchange rate quote (periodic average)	0.32	0.36	0.66	0.44	0.42	10/31/2017

a. The spread between the yield on emerging market government bonds and the yield on US Treasury bills.

b. Due to a change in TASE indices, the data throguh February 10, 2017 is based on the TA-25 Index, and from that date onward based on the TA-35 Index.

c. The five major banking groups.

d. Until 2009, according to Basel I definitions; Between 2009 and 2013, according to Basel II definitions; From 2014, according to Basel III definitions.

e. Including main provident funds for severance and advanced study funds.

f. Including trading volume of *makam* , government bonds, corporate bonds and shares.

SOURCE: Based on data from the International Monetary Fund, the Capital Markets, Insurance and Savings Authority of the Ministry of Finance, and the Tel Aviv Stock Exchange.