Box 5.1
Macroeconimic stress test of the banking system for 2022

- As is common practice worldwide, the Banking Supervision Department again this year carried out a macroeconomic stress test of the banking system based on a uniform scenario. The stress scenario does not constitute any type of forecast but only a hypothetical scenario that is meant to test the resilience of the banking corporations under various crisis conditions, as well as locate their focal points of vulnerability.

- The stress test involved a global shock that spreads to Israel and is manifested in a worldwide increase in interest rates as a result of high inflation levels, a severe slowdown in economic activity, and financial market declines in Israel and worldwide. Later in the scenario, after the halting of inflation, the central banks change direction by sharply reducing interest rates in an attempt to restart economic activity.

- This year, credit losses were for the first time estimated using the Current Expected Credit Loss (CECL) method, subject to the perfect foresight assumption with respect to forecasts of macroeconomic variables during the entire scenario.

- The results of the stress test this year indicate that a macroeconomic shock involving a global slowdown, which is manifested also in the Israeli economy, is expected to have a significant effect on the profitability of the banking system, but not to endanger its stability. None of the banking corporations in the stress scenario drop below the minimum level of capital required by the Banking Supervision Department (Tier 1 Capital of 6.5 percent), as a result of, among other things, relatively high capital ratios at the starting point.

- The results of the scenario show that the increase in inflation and interest rates raise net interest income in the banking system while at the same time making the situation difficult for borrowers, including mortgage holders, and as a result there is an increase in credit losses within the bank credit portfolio. At a later stage in the scenario, net interest income drops when inflation rates and interest rates decline significantly.

- As in past scenarios, credit losses are the main factor affecting capital ratios, such that over the course of the scenario there are high credit loss provisions for all segments of the economy. Under the perfect foresight assumption, together with the forward-looking CECL approach, most of the credit losses, and accordingly the decline in profits, are observed in the first year of the scenario.

The Banking Supervision Department carried out a macroeconomic stress test based on a uniform scenario[1] for the banking system[2] again this year,[3] in accordance with common practice in other countries. This enables the banking corporations to assess the results of the test through a bottom-up approach, using a variety of models and methodologies. At the same time, the test is also carried out by the Banking Supervision Department and in that context the banks are tested using a top-down approach. The process contributes to identifying focal points of vulnerability to which each of the banks and the banking system as a whole are exposed. As such, it constitutes a supplementary tool for assessing their resilience and strength and for ensuring a sufficient level of capital, given the risk originating from those loci.

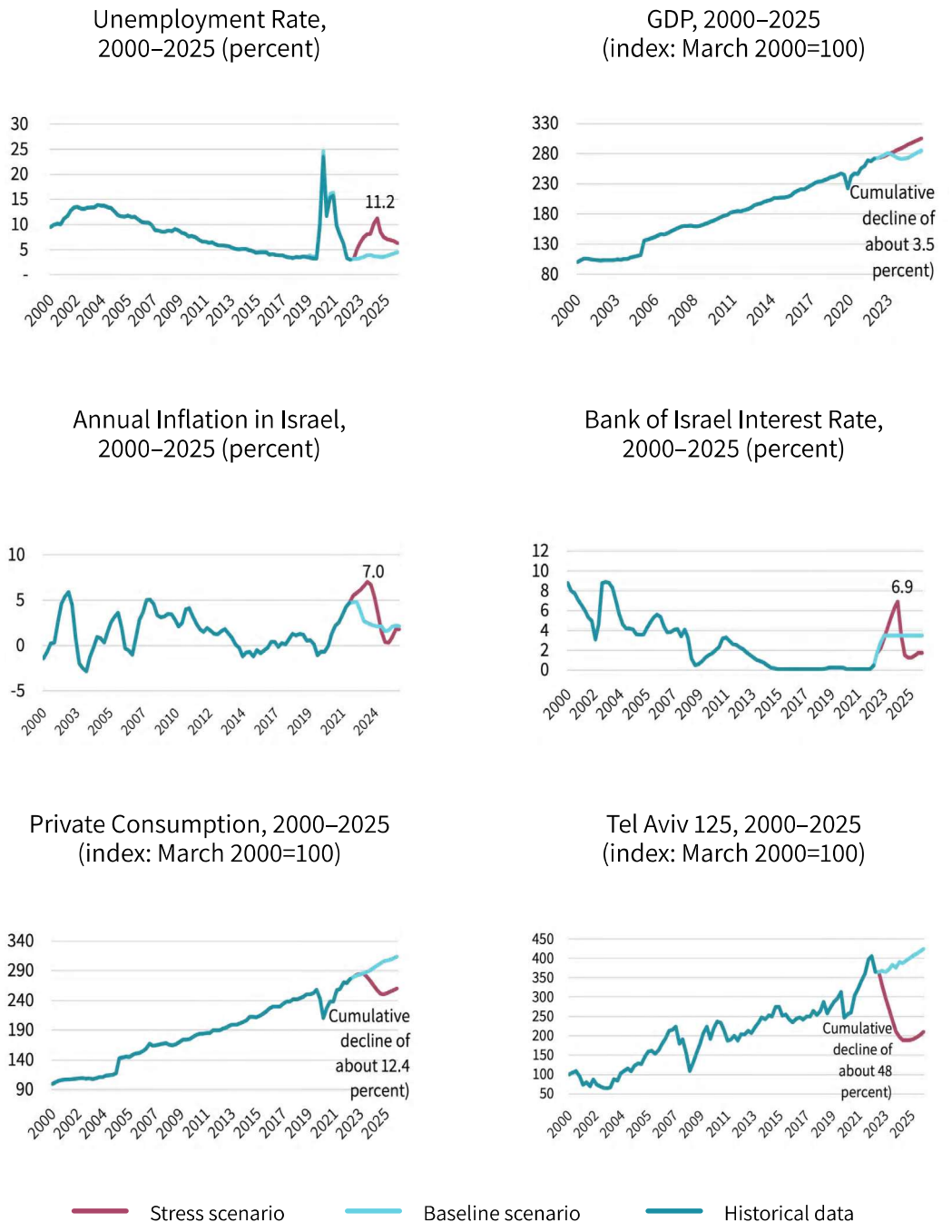
1 The test is based on a uniform scenario with the goal of determining whether the banks have sufficient capital in order to absorb the losses that will occur in an extreme macroeconomic event and without endangering their stability or the money of depositors.

2 The five banking groups and the Jerusalem Bank.

3 The Banking Supervision Department has been carrying out stress tests since 2012.

The beginning of the scenario is characterized by a significant increase in interest rates, inflation and unemployment, alongside a drop in asset prices, and a recovery later in the scenario.

Figure 5.59 Historical Macroeconomic Data, 2000–June 2022, and Development of Scenarios, July 2022–2025



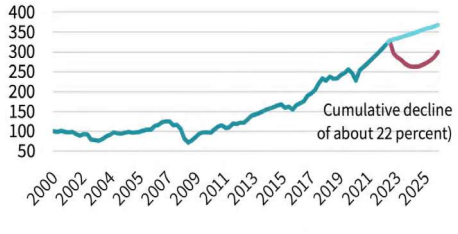
SOURCE: Historical data based on Central Bureau of Statistics and Tel Aviv Stock Exchange; Scenarios - Bank of Israel.

Yield on 10-Year Indexed Gov't Bonds, 2000–2025 (percent)

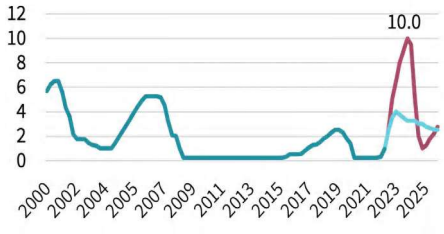
Index of Home Prices, 2000–2025 (index: March 2000=100)

Annual Inflation in the US, 2000–2025 (percent)

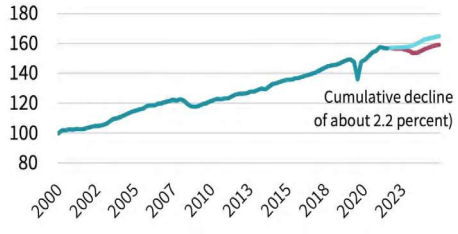
Dow Jones Industrial Average, 2000–2025 (index: March 2000=100)



Federal Reserve Interest Rate, 2000–2025 (percent)



GDP in the US, 2000–2025 (index: March 2000=100)



Stress scenario Baseline scenario Historical data

SOURCE: Historical data based on Central Bureau of Statistics and Tel Aviv Stock Exchange; Scenarios - Bank of Israel.

The test is based on two macroeconomic scenarios that were constructed together with the Research Department at the Bank of Israel (Figure 5.60). **It is important to emphasize that these scenarios do not constitute any sort of a forecast but rather are intended to test the resilience of the banking corporations in a macroeconomic crisis environment.** The scenarios are as follows:

1. **Baseline scenario –** This scenario reflects the expected path of convergence for the economy and is based on the assessments of the Research Department at the Bank of Israel, the macro forecasts of international organizations regarding global developments and other assessments of economic developments in Israel and worldwide;

2. **Stress scenario –** This scenario is based on a global shock that is the result of disruptions to the supply chain and the war in Ukraine and that brings about a shortage in basic raw materials worldwide. As a result, the economy's production capacity becomes constrained. In parallel, the cost of services begins to rise and inflation increases sharply in both the leading economies and in Israel. In order to restrain inflation, the central banks maintain their contractionary monetary policies and raise monetary interest rates significantly and rapidly. The large and rapid hikes in interest rates lead to a major increase in the cost of credit which in turn leads to a widening of bond spreads, particularly in the real estate industry. Alongside the increase in inflation, this leads to a prolonged slowdown in domestic and global economic activity, which is accompanied by a significant increase in unemployment, a decline in private consumption, a contraction in Israel's exports and imports and declines in stock and bond prices. The prolonged slowdown leads to a reduction in investment, which results in a large depreciation in the shekel. The aforementioned, alongside the halting of inflation, and in an attempt to prevent a worse recession and revive economic activity, leads the central banks, including the Bank of Israel, to adopt an accommodative monetary policy by sharply lowering interest rates. Towards the end of the scenario there is a recovery in economic activity in Israel and worldwide, inflation converges to its target and accordingly the Bank of Israel starts to gradually raise the interest rate.

The Banking Supervision Department carried out the stress test based on various assumptions, which were intended to facilitate the analysis of the scenario's effect on each of the banks and identify focal points of vulnerability both at individual banks and in the banking system as a whole. These assumptions include: a dynamic balance sheet (that is, the credit portfolio and the public's deposits develop according to the

scenario); [4] the banks are permitted to raise additional capital during the scenario; and no account is taken of actions that the banks' managements might take in response to the crisis. **The results of the stress test demonstrate the direct effect of the scenario on capital, profitability, the credit portfolio and the equity portfolio, though they do not include an assessment of the banks' liquidity or any indirect effects, such as the lowering of the banks' ratings or a decline in investor confidence.**

The credit losses in the scenario were measured this year according to the CECL standard. According to that standard,[5] the credit loss allowance is calculated according to the expected loss over the life of the credit, using forward-looking information that reflects reasonable forecasts of future economic events. In order to estimate the credit losses according to the CECL standard, a number of modifications were made to the models and the scenario assumptions. The main assumption in the new methodology is "perfect foresight" with respect to the development of macro variables during the period of the scenario, as in stress tests carried out by the BOE and the EBA.[6] The significance of this assumption, together with the forward-looking CECL approach, are reflected in the fact that in all segments of the economy, most of the credit losses are observed during the first year of the scenario (i.e., 2023), which leads to a peak in the scenario's effect on capital ratios and banking system profitability relative to the previous estimation methodology, in which credit losses were spread out over the three years of the scenario. (This was due to, among other things, the rapid occurrence of failures combined with the trends in macroeconomic variables and the lack of synchronization of failures between the various segments of the economy).[7]

[4] Up until 2020, the stress tests were carried out under the assumption of a static balance sheet, such that the banks' balance sheets remain unchanged during the course of the scenario, with respect to both total credit and total deposits of the public. The transition to a scenario under the assumption of a dynamic balance sheet was based on the understanding that stress events also have implications for the banks' balance sheets, which creates additional risk not estimated under the assumption of a static balance sheet (in which the balance sheet remains fixed during the course of the scenario). This assumption has opposing effects, since on the one hand it works to increase interest income due to the increase in total credit while on the other hand the increase in credit works to increase risk assets, which constitutes one of the main factors adversely affecting the Tier I Equity Capital Ratio during the scenario. As in the case of the macroeconomic scenarios, the path of growth in credit and deposits in the scenarios does not constitute a forecast but rather is only hypothetical.

[5] Current Expected Credit Loss.

[6] EU-WIDE STRESS TEST 2021, July 2021, EBA and Financial Stability Report December 2019, The results of the 2019 stress test of UK banks, BOE.

[7] For example, in the past, the credit loss provision for housing credit was calculated according to the length of the lag, which led to the recognition of credit losses in this segment at a relatively late stage of the stress scenario.

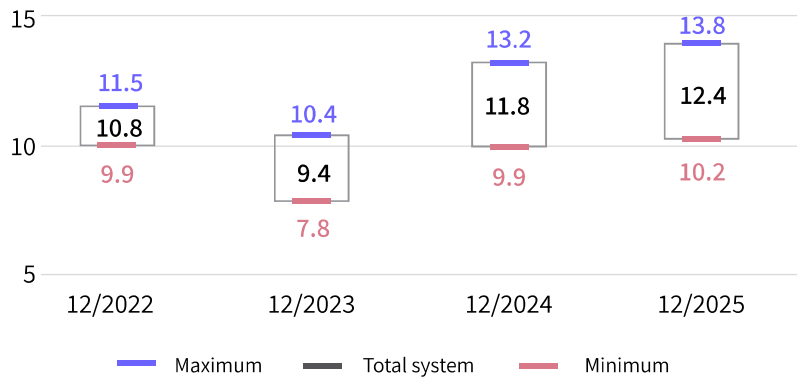
The test results

The results of the stress test this year indicate that a macroeconomic shock involving a global slowdown, which also leads to a recession in the Israeli economy, is expected to have a significant impact on the profitability of the banking system, but not to endanger its stability. Under the assumption of perfect foresight, there are significant credit losses during the first year of the scenario (i.e., 2023), which is in accordance with the path of the macroeconomic variables during the scenario, including a rise in the unemployment rate, the Bank of Israel interest rate and inflation, which increase the burden of debt repayment on borrowers. Nonetheless, the increase in inflation and the interest rate have a moderating effect on the losses to the banks since they lead to an increase in net interest income.

The Israeli banking system is stable and possesses sufficient capital to withstand this scenario, notwithstanding the significant losses it would incur. There is no banking corporation that drops to below the minimal capital level required by the Banking Supervision Department (Tier 1 Capital ratio of 6.5 percent) as a result of the stress scenario. The average Tier 1 Capital ratio in the system falls by 1.4 percentage points in the stress scenario, from 10.8 percent in 2022 to about 9.4 percent at the end of 2023 (which is the peak of the crisis in the scenario; Figure 5.60). This is similar to the decline in the scenario simulated last year and is higher than in the scenarios carried out in previous years.[8] With respect to the individual banks, there was variation across the banks which was a result of their capital ratios at the starting point, the mix of their asset portfolios and the quality of their credit portfolios.

There were no banking corporations in the stress scenario that fell below the minimal capital ratio required by the Banking Supervision Department.

Figure 5.60 Development of Tier-1 Capital Ratio in the System Throughout a Stress Scenario, (percent)



SOURCE: Banking Supervision Department.

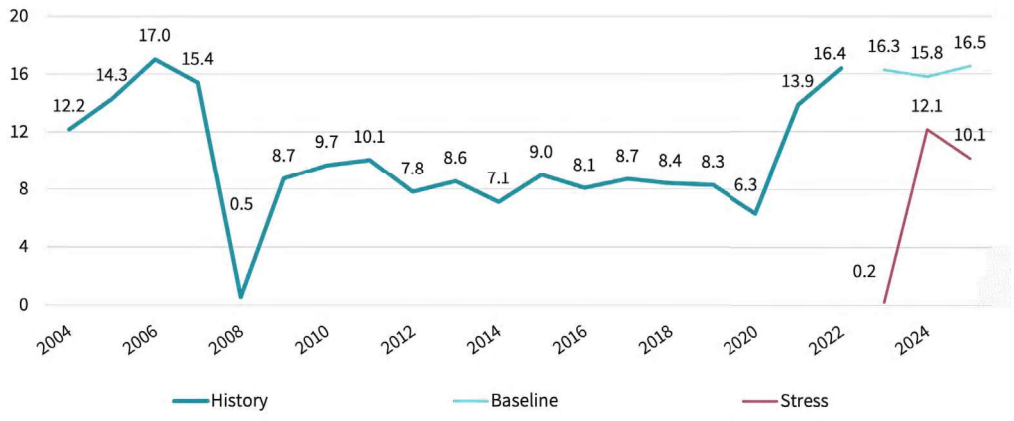
[8] Relative to scenarios carried out from 2017 to 2020, in which the decline was between 0.5 and 0.9 percentage points.

The stability of the banks over the course of the scenario is a result of the policy of capital reinforcement, in which the Banking Supervision Department has taken a leading role in recent years, and which contributed to relatively high capital ratios at the starting point of the scenario. Furthermore, the path of the scenario—which in the first 18 months includes high rates of inflation and interest rates—works to increase net interest income in the banking system due to its surplus of interest-bearing assets over interest-bearing liabilities (see Chapter 3 in this survey). Nonetheless, this surplus diminishes over the course of the scenario due to the shift from non-interest-bearing deposits to interest-bearing deposits as a result of the increase in interest rates. However, the slowdown in the economy and the increase in unemployment, together with high inflation and interest rates, create a burden on borrowers, including the business sector and mortgage holders. The result is an increase in credit losses in the business credit portfolio and in the housing portfolio, alongside significant losses in the rest of the segments. Another channel that leads to a reduction in the capital ratio at the peak of the scenario is the increase in bond yields during the first year of the scenario (Figure 5.59), which works to reduce the value of the ready-for-sale portfolio and erodes equity capital by way of the total profit line.

The profitability of the banks is expected to be adversely affected at the peak of the scenario. All of the banks record significant losses in at least one quarter. The average return on equity in the banking system is expected to drop from 16.4 percent at the start of the scenario to about 0.2 percent at its peak, although it rebounds at the end of the scenario to a level close to the average in recent years (10.1 percent; Figure 5.61).

There is a significant reduction in return on equity during the first year of the scenario (2023).

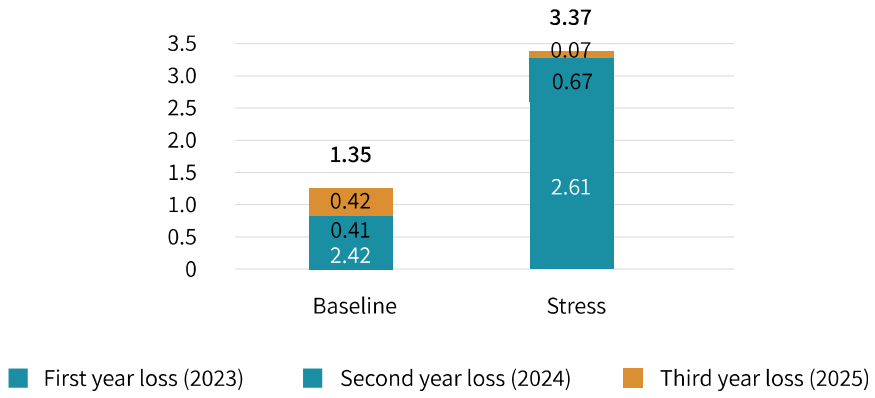
Figure 5.61 Development of Return on Equity According to the Stress Scenario, Total Banking System, 2004–2025



SOURCE: Banking Supervision Department.

Most loan loss provisions in the stress scenario are in the first year of the scenario (2023)

Figure 5.62 Loan Loss Provisions as a Share of Total Credit Portfolio, Baseline and Stress Scenarios (percent)

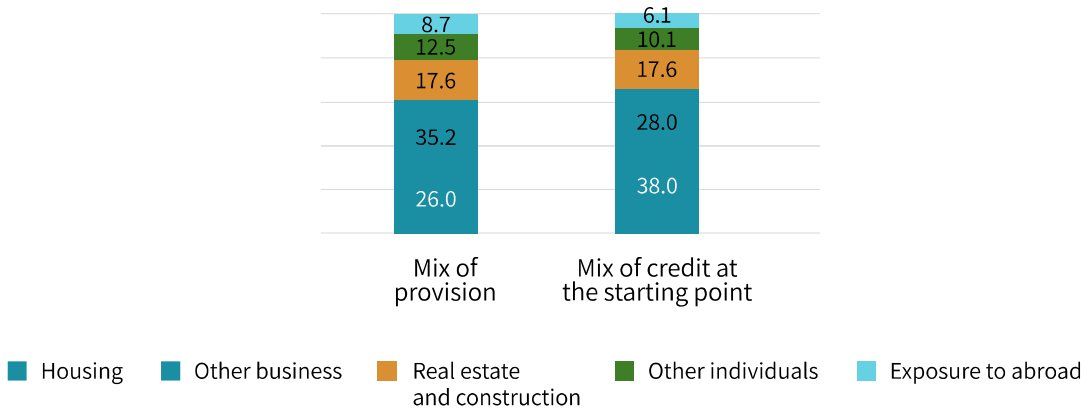


SOURCE: Banking Supervision Department.

As in past scenarios, credit losses have the largest effect on the capital ratios and profitability in the banking system. In all industries, the rate of credit loss provisions is high and the credit losses are primarily recorded already during the first year of the scenario, in accordance with the CECL approach (Figure 5.62). Accordingly, and as mentioned above, there is a larger effect on the banking system's capital ratio and profitability at the peak of the scenario relative to the previous estimation methodology, in which credit losses were spread out over the three years of the scenario. Nonetheless, the average provisions rate during the scenario is 1.1 percent, which is similar to that in scenarios carried out in previous years, in which the average provisions rate ranged from 0.8 percent to 1.2 percent. Similarly, it appears that over the course of the scenario there is a disparity between the distribution of the credit portfolio and that of the credit losses. The main losses in the scenario (accounting for about 35 percent of the total) are due to the other business portfolio (the total portfolio of business credit excluding credit to the construction and real estate industry), even though its weight in the credit portfolio is only about 28 percent (Figure 5.63), which implies an average provisions rate of 1.4 percent over the course of the scenario (Figure 5.64). There also were high rates of loss in the construction and real estate industry in which the average provisions rate reached 1.1 percent. With respect to the housing portfolio, which constitutes 38 percent of the total credit portfolio, its average share of the credit loss provisions within total losses stood at 26 percent (Figure 5.63).

The share of housing credit within total losses is lower than its share of the total credit portfolio, while the share of business credit within total losses is higher than its share within the total credit portfolio.

Figure 5.63 Distribution of Credit Losses by Main Industry in a Stress Scenario Compared with Distribution of Credit Portfolio (percent)



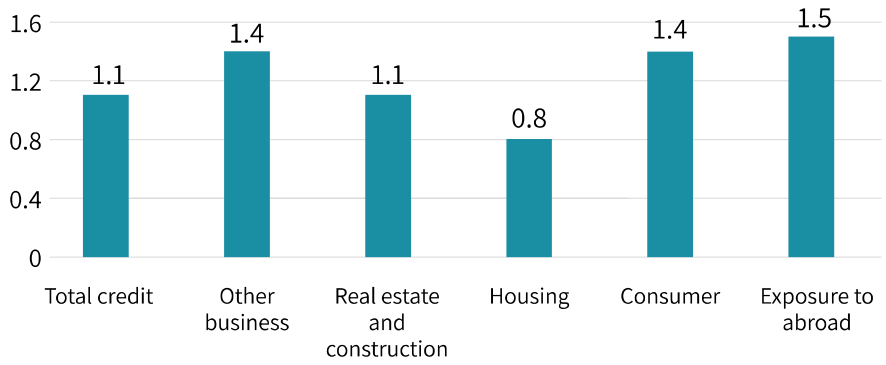
SOURCE: Banking Supervision Department.

This disparity is due to the low level of risk in housing credit relative to other segments, which is the result of a series of measures adopted by the Bank of Israel over the years in order to deal with this risk. These include limiting the payment-to-income (PTI) ratio, and the loan-to-value (LTV) ratio. Nonetheless, the risk in this portfolio has grown somewhat in recent years, with the increase in the weight of variable-rate loans and in the portfolio's average PTI ratio (see Chapter 5 in this survey) which is reflected in somewhat higher rates of loss in the current scenario, given the rise in interest rates and in the unemployment rate. The consumer credit portfolio recorded high expense rates in the scenario, which reached an average of 1.4 percent, although its weight in the total expense is relatively low due to its low weight within the total credit portfolio (Figure 5.63). The average provisions rate in the scenario due to exposure to credit provided abroad (1.5 percent) is high in this scenario and is primarily the result of the sharp deprecation in the shekel which occurs over the course of the scenario. However, its weight in total provisions is the lowest, given its low weight in the total credit portfolio.

The drop in profitability as a result of the increase in the credit loss provisions is moderated by the increases in inflation and the interest rate, since they contribute to an increase in net interest income at the beginning of the scenario, as mentioned.

There are high provision rates recorded in all segments of the economy.

Figure 5.64 Average Annual Provision in the Main Industries Throughout the Stress Scenario (percent)



SOURCE: Banking Supervision Department.