Chapter 3
Risks and Capital Adequacy

In the course of their activity the banks are exposed to a wide range of risks, including credit risks, market risks, liquidity risk, operational risks and legal risks. In this section, we will focus on credit risks, market risks and liquidity risk. We will analyze the changes that have occurred in capital adequacy, which acts as a cushion for absorbing unexpected losses which the banks could incur if those risks actually materialize, we will calculate the Risk Adjusted Return on Capital (RAROC) and describe the development of the Robustness Index for examining the resilience of the Israeli banking system over time.

The banking system's aggregate credit risk exposure continued to decline in 2007 as a result of the sustained growth in the economy. However, the global credit crunch, which developed in the second half of 2007 began to be felt towards the end of the year, when the volatility in the financial markets and the risk premium on corporate bonds increased. This trend became even more apparent in the first quarter of 2008 and was reflected by a slower pace of growth. We expect that these changes in the business environment in which the banks operate to lead to a growth in their aggregate credit risk.

Credit risk is analyzed on the basis of three criteria: the quality, the concentration and the size of the credit portfolio. Credit quality improved in 2007, and the improvement was apparent in most principal industries as well as among private customers. A negative development was an increase in the concentration of the credit portfolio due to the higher proportion of the financial services and the construction and real estate industries. The industries, which were dominant in the portfolio from the outset, accounted for a third of bank credit in 2007. The size of the credit portfolio also expanded, at a higher rate than the growth in the economy. During the year reviewed, the banks' exposure to market risk increased due to the high level of volatility in the financial markets, interest rates and exchange rates. But despite the increased volatility, their level of exposure remained low. The ratio of capital to risk-weighted assets rose slightly due to a growth in Tier I capital. The capital base expanded *inter alia* because the Banking Supervision Department recently instructed the banks to include a capital target of 12 percent in their business plans by the end of 2009.

1. CREDIT RISK

Credit risk is the principal financial risk to which a bank is exposed in the course of its activity. In this section we will analyze exposure to credit risk in terms of the size, quality and concentration of credit. We will also examine the development of loan activity and risk in the principal industries.

The improvement in the quality of the credit portfolio, which began in 2005, continued in 2007 and was reflected by the portfolio quality indices. However, the size of the credit portfolio and its concentration increased, as reflected by a growth in the proportion of the financial services industry and the construction and real estate industry. The global credit crunch, which developed in the second half of 2007, began to be felt towards the end of the year when the volatility in the financial markets and the risk premium on corporate bonds increased.

a. The size of the credit portfolio[1]

The credit portfolio expanded by 10 percent in 2007 compared with 7 percent in 2006, thereby increasing the banks' exposure to credit risks. The expansion of the portfolio was reflected in balance-sheet items (9 percent) and in off-balance-sheet items (13 percent), and encompassed all principal industries and especially the financial services industry and the construction and real estate industry, credit to which accounted for approximately one third of the entire credit portfolio. In addition, the rate of expansion in balance-sheet credit exceeded the growth rate in the economy for the first time since 2002 (Table 1.4),[2] a development that is indicative of an increase in credit risk. At the same time however, the ratio between this credit and the capital base, which is intended to absorb the banks' losses including their losses, in respect of credit risk, rose slightly, by 7 percentage points.

b. The quality of the credit portfolio

In 2007 as well, the favorable pattern of economic developments since the end of 2003 had the effect of increasing borrowers' repayment ability and reducing the materialization of credit risks. The result was an improvement in the quality of the credit portfolio as reflected in the majority of indices based on the annual financial statements.[3] The onset of the global credit crunch in the second half of 2007 triggered an economic slowdown

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1 The size of the credit portfolio includes balance-sheet credit risk and off-balance-sheet credit risk, on the basis of the aggregate credit risk reported to the public in Appendix F to the financial statements. See Chapter 1 for further details.

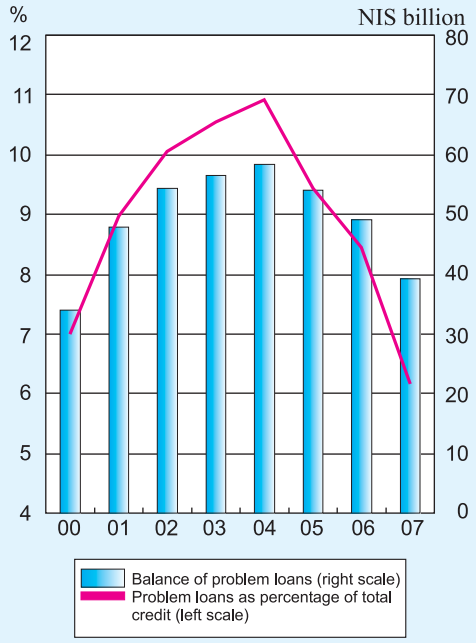
2 See Chapter 1 for more details.

3 The credit quality indices express the probability of a borrower or borrower group failing to repay part of their liabilities to the bank (principal and/or interest) on time.

in many countries. The moderate impact of the credit crunch on the Israeli economy was apparent from the increased volatility in the market and the rise in the risk premium on corporate bonds, which reflect the credit risk of companies in the economy, from the reduced volume of issues by high-risk companies, and from forecasts of a slower pace of annual growth in the economy.

The analysis of the quality of the credit portfolio in this review is based on the indices generally employed for measuring the quality of the portfolio, which are derived from the financial statements, on the quarterly credit exposure report[4] via which the banks report on their credit exposure to large borrowers, and on indicators from the capital market. Part of the indices show an improvement in credit quality, part of them are indicative of stability, and part of them show an increase in credit risk.

Figure 3.1
Problem Loans as a Proportion of Total Credit vis-à-vis Problem Loan Balance in the Five Major Banking Groups, 2000-07



SOURCE: Based on published financial reports.

The proportion of balance-sheet credit to problem borrowers to total credit fell by 2.3 percentage points and amounted to 6.2 percent, the lowest level since the end of 1999 (Table 3.1, Figure 3.1). The decrease encompassed all five banking groups. Balance-sheet credit to problem borrowers, which account for 87 percent of total problem loans, contracted by NIS 10 billion to NIS 39 billion (Table 3.2, Figure 3.1). The improvement in problem loans encompassed all five of their components (Table 3.2).[5] As compared to the improvement in problem loans in respect of credit to the public, the volume of problem borrowers' bonds increased by NIS 471 million, a development that resulted from the subprime crisis (Table 3.2). Off-balance-sheet risk to problem borrowers, which accounts for only 13 percent of total exposure to such borrowers, remained unchanged in 2007, and total exposure to problem borrowers fell to NIS 45 billion (Table 3.2).

4 As defined in the directives for reporting to the Banking Supervision Department 810D.

5 Balance-sheet problem loans are divided into 5 sub-categories as defined in Proper Conduct of Banking Business Regulation 314. The components of problem loans in order of their severity, beginning with the most serious category are: non-performing loans, rescheduled loans, loans designated for rescheduling, loans in temporary arrears and loans under special supervision.

Table 3.1
Indices of Credit Portfolio Quality the Five Major Banking Groups, 2002-07

		Hapoalim	Leumi	Discount	Mizrahi–Tefahot	First Intl.	The five groups
Ratio of risk-weighted assets to total assets[a]	2002	0.715	0.701	0.571	0.653	0.656	0.675
	2003	0.711	0.685	0.581	0.645	0.654	0.669
	2004	0.714	0.674	0.588	0.670	0.617	0.667
	2005	0.719	0.679	0.600	0.673	0.614	0.673
	2006	0.722	0.670	0.598	0.666	0.613	0.669
	2007	0.728	0.690	0.619	0.682	0.591	0.681
Share of balance sheet credit to problem borrowers[b] in total credit to the public (%)	2002	10.4	9.8	12.4	7.5	9.1	10.1
	2003	11.3	9.8	11.9	7.6	12.3	10.6
	2004	11.9	11.0	10.7	6.6	12.9	10.9
	2005	9.9	9.6	9.0	6.8	11.9	9.4
	2006	8.5	9.8	7.8	6.0	7.6	8.4
	2007	6.4	6.5	6.3	5.0	5.1	6.2
Share of non-performing loans in total credit to the public (%)	2002	2.1	2.3	3.9	1.7	2.9	2.5
	2003	2.9	2.3	3.8	1.3	2.5	2.6
	2004	3.3	1.5	3.7	1.5	3.4	2.6
	2005	2.9	1.3	3.1	1.5	2.7	2.3
	2006	2.4	1.4	2.8	1.4	1.6	1.9
	2007	1.9	0.8	2.2	1.3	1.2	1.5
Ratio of annual loan-loss provision to total credit risk[c] (multiplied by 100)	2002	1.18	0.78	0.74	0.40	1.00	0.90
	2003	0.90	0.79	0.72	0.40	0.81	0.78
	2004	0.62	0.63	0.73	0.43	0.56	0.61
	2005	0.41	0.55	0.50	0.34	0.36	0.45
	2006	0.30	0.35	0.37	0.33	0.25	0.32
	2007	0.14	0.14	0.25	0.23	0.19	0.17
Share of the balance of the loan-loss provision in total problem debts *plus* the balance of the loan-loss provision (%)	2002	29.9	28.6	32.8	29.5	28.5	29.9
	2003	33.3	31.7	36.3	31.9	25.6	32.5
	2004	34.7	30.8	40.5	37.1	29.9	34.2
	2005	38.2	34.6	42.8	37.4	30.8	37.1
	2006	41.0	34.0	46.4	40.4	41.2	39.3
	2007	44.4	40.4	48.1	43.9	50.1	44.2

[a] Total risk assets are total balance sheet and off-balance-sheet assets weighted by risk. Total assets are total balance sheet and off-balance-sheet assets without risk weighting.

[b] Including non-performing loans, restructured loans, loans to be restructured, loans temporarily in arrears, and loans under special supervision.

[c] Credit risk *minus* bonds and *minus* credit risk on derivatives.
SOURCE: Based on published financial reports.

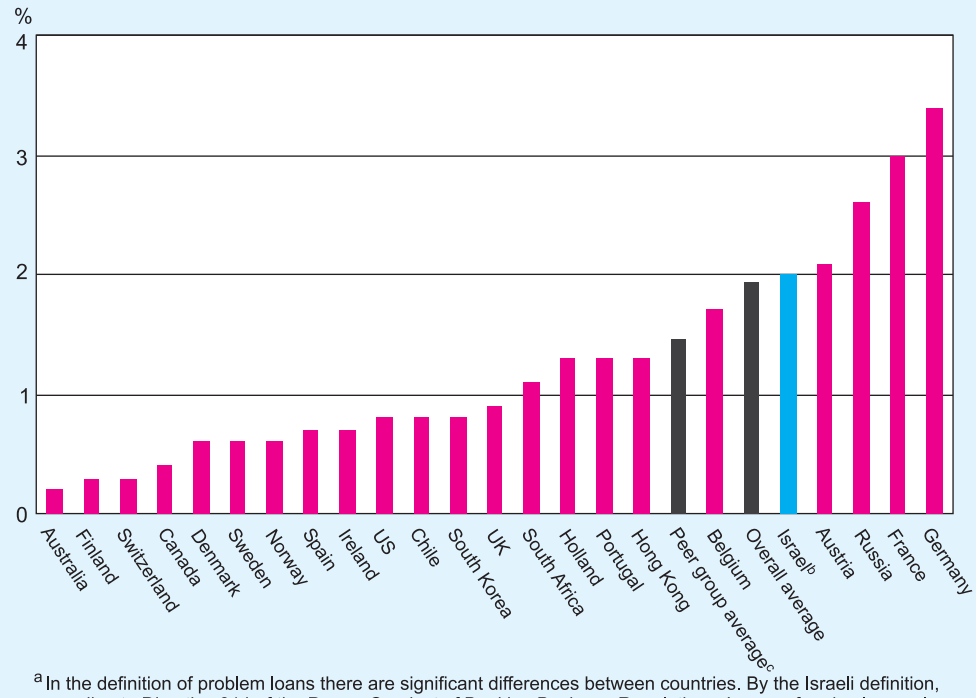
Table 3.2
Distribution of Problem Loans, the Five Major Banking Groups, 2005-07

		Hapoalim	Leumi	Discount	Mizrahi–Tefahot	First Intl.	The five groups
				(NIS million)[a]			
Non-performing	2005	5,639	2,431	2,740	996	1,188	12,994
	2006	4,496	2,519	2,529	1,003	815	11,362
	2007	3,820	1,604	2,230	934	662	9,250
Rescheduled	2005	1,473	985	457	131	221	3,267
	2006	2,339	1,179	286	172	236	4,212
	2007	1,536	929	278	185	281	3,209
Due to be rescheduled	2005	1,479	1,070	92	1	277	2,919
	2006	369	134	143	15	348	1,009
	2007	338	85	33	2	0	458
In temporary arrears	2005	1,147	698	555	1,424	261	4,085
	2006	970	658	327	1,475	224	3,654
	2007	1,164	764	387	1,027	172	3,514
Under special supervision	2005	9,319	12,404	4,034	1,897	3,305	30,959
	2006	7,727	13,548	3,771	1,579	2,349	28,974
	2007	6,261	9,618	3,520	1,582	1,696	22,677
of which: Debts for which there is a specific loan-loss provision	2005	5,831	6,936	1,592	241	761	15,361
	2006	4,715	5,484	1,325	146	405	12,075
	2007	4,085	4,666	925	120	401	10,197
of which: Housing credit for which there is a loan-loss provision according to the depth of the arrears	2005	417	592	202	797	111	2,119
	2006	431	830	210	745	117	2,333
	2007	499	523	188	670	107	1,987
Total balance-sheet credit to problem borrowers	**2005**	**19,057**	**17,588**	**7,878**	**4,449**	**5,252**	**54,224**
	2006	**15,901**	**18,038**	**7,056**	**4,244**	**3,972**	**49,211**
	2007	**13,119**	**13,000**	**6,448**	**3,730**	**2,811**	**39,108**
Total off-balance-sheet credit to problem borrowers	2005	1,850	2,060	728	446	343	5,427
	2006	1,706	2,410	928	494	288	5,826
	2007	1,512	2,438	978	616	255	5,799
Bonds of problem borrowers	2005	294	0	68	0	2	364
	2006	97	15	1	0	3	116
	2007	525	4	1	0	3	533
Other assets related to derivatives of problem borrowers	2005	3	154	1	0	0	158
	2006	10	23	10	0	0	43
	2007	1	32	22	0	0	55
Total exposure to problem borrowers	**2005**	**21,204**	**19,802**	**8,675**	**4,895**	**5,597**	**60,173**
	2006	**17,714**	**20,486**	**7,995**	**4,738**	**4,263**	**55,196**
	2007	**15,157**	**15,474**	**7,449**	**4,346**	**3,069**	**45,495**

SOURCE: Based on published financial reports.

The proportion of non-performing loans[6] to total credit to the public reached the level recorded in the year 2000 1.5 percent (Table 3.1), and non-performing loans plus loans in temporary arrears to total loans[7] fell by 0.6 percentage points, although their level is still higher than the average for Israel's peer group of countries (Figure 3.2).[8]

Figure 3.2
Ratio of Non-Performing Loans to Total Loans[a] in Selected Banking Systems, 2006



[a] In the definition of problem loans there are significant differences between countries. By the Israeli definition, according to Directive 314 of the Proper Conduct of Banking Business Regulations, 'non-performing loans plus loans in temporary arrears' is the closest definition to the internationally accepted efinition of 'non-performing Loans.'
[b] To December 2007.
[c] Israel's peer group consists of eight similar countries in terms of size of GDP and banking system: Belgium, Denmark, Finland, Greece, Ireland, Norway, Portugal and South Africa.
SOURCE: Based on data from the International Monetary Fund.

6 A non-performing loan is a debt on which the interest is not charged to the statement of income, a rescheduled loan, the balance of which (including accrued interest) before the time of the new arrangement exceeds the amount of receipts expected under the arrangement, a debt in arrears or another debt on which the charging of the interest accrued is not expected even if the debt itself it not defined as doubtful.

7 Countries differ considerably in their definition of problem loans. The Israeli term closest to NPLs is total non-performing debt plus loans in temporary arrears (which are defined in Proper Conduct of Banking Business Regulation 314).

8 The peer group includes eight countries with levels of GDP and banking systems that are similar to Israel's: Belgium, Denmark, Finland, Ireland, Greece, Norway, Portugal, and South Africa.

The amount of the loan-loss provision charged to the statement of income fell considerably in 2007 to NIS 1,776 million.[9] The decrease derived from the continued improvement in the economy and in companies' financial position, and as a result of the special provisions for housing loans recorded in 2006 in accordance with a Bank of Israel directive.[10] The large decrease in the rate of the provision together with the increased volume of credit led to a continuation of the downtrend in the ratio of the annual expense on the loan-loss provision to credit to the public, which began in 2003 and reached its lowest level since 1996 (Table 3.1). Due to the global crisis, which began in the subprime mortgage market in the USA and its rapid spread to financial and non-financial markets worldwide and in view of the slower pace of growth in the Israeli economy, it is doubtful whether the ratio of the expense on the loan-loss provision to credit to the public fully reflects the credit risk currently inherent in the banks' credit portfolios. In 2007, the proportion of the balance of the loan-loss provision to balance-sheet problem loans plus the balance of the loan-loss provision[11] increased due to the large decrease in the ratio of problem loans, although the increase was slightly offset by the reduction in the provision.[12] In contrast to the major improvement in all the credit quality indices reviewed so far, a deterioration was recorded in the ratio of risk-weighted assets to total assets,[13] reflecting the extent of the risk in the asset mix. The increase in this ratio encompassed all the banking groups except for the First International group (Table 3.1), and resulted from the expansion in credit the public,[14] which is regarded as a higher risk asset, and from the decrease in cash in hand and deposits at banks, which are notable for a low level of risk. In addition, the rate of expansion in credit during 2007 exceeded the rate of growth in GDP, which is the source for credit repayment. The ratio of credit to GDP thereby rose for the first time in four years, to a level of 1.34 (Table 1.4). The increase in this ratio expresses an increase in credit risk.

In the credit exposure report, the banks grade the credit risk of every borrower.[15] Since the grading scales reported by the banks differ, for the purpose of this review we have constructed a standard grading scale for all five largest banks, whose values range between 0 and 100.[16] The lower the value reported, the higher is the company's credit quality. We examined borrowers whose outstanding credit risk exceeded NIS 20 million,

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9 See Chapter 2 for more details.

10 See the Annual Survey for 2006, page 73.

11 This ratio measures the bank's assessment of the loan losses that will materialize in the future and which have been recognized in the statement of income, relative to the size of the credit portfolio which it has classified as problematic. A high ratio reflects a low potential for future losses from the bank's problem loan portfolio.

12 See Chapter 2 for further details.

13 The ratio between balance-sheet credit risk-weighted assets and off-balance-sheet credit risk, as calculated in accordance with the Supervisor of Banks' directives concerning the minimum capital ratio, and outstanding balance-sheet and off-balance-sheet credit.

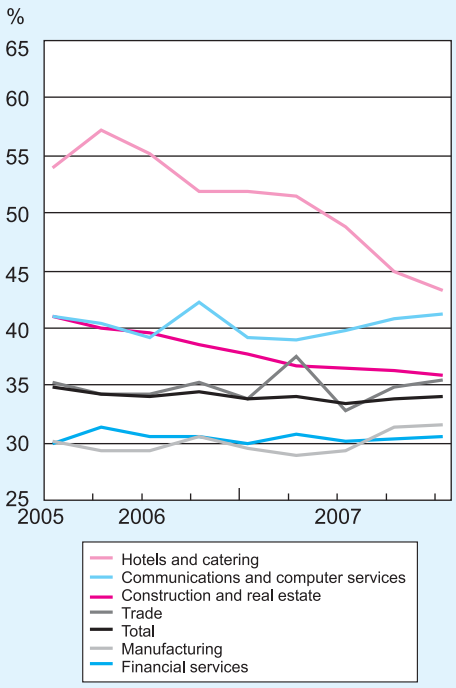
14 See Chapter 1 for more details.

15 Credit risk includes balance-sheet credit risk and off-balance-sheet credit risk after provision for loan losses.

16 The credit grade 0-36 denotes low risk, 37-57 medium risk, and 58-100, high risk.

and these accounted for 45 percent of total credit risk. An analysis of these borrowers is indicative of stability at the average credit grade[17] at the five largest banks during 2007 following an improvement in recent years (Figure 3.3). The stability in credit risk derived from two developments that exerted opposing effects – a 2.8 percentage point decrease in the proportion of high-risk borrowers,[18] to 4.8 percent of total credit risk at the end of 2007, concurrent with a 0.3 percentage point decrease in the proportion of low-risk borrowers, to 68.2 percent of total credit risk (Figure 3.4).

Figure 3.3
Average Credit Risk Rating, by Principal Industries, December 2005 to December 2007



SOURCE: Reports to the Supervisor of Banks-Report on Large Risk Credit Exposures.

Although the impact of the global financial crisis that developed in the second half of 2007 was not reflected either in the indices based on published financial statements or in the borrower ratings in the credit exposure report, it was expressed in a number of capital market indices, which showed an increase in the banking system's credit risk.[19]

The improvement in credit quality as reflected in the financial statements is also apparent from an analysis of the credit risk of the principal industries: The expansion in the activity of the principal industries, which was reflected by an increase in outstanding credit, coupled with the decrease in problem loans led a decline in the proportion of problem loans to outstanding credit in all of the principal industries (Table 3.3). The rate of provision in respect of the principal industries[20] also fell – mainly in the construction and real estate industry, the financial services industry and housing loans (Table 3.3). An analysis of credit ratings by principal industry on the basis of the credit exposure report shows that credit risk remained stable over the year, and that the principal industries differ in the extent of their risk (Figure 3.3). Although the credit quality in the tourism industry improved during recent years, the level of risk in the industry has remained high (Table 3.3, Figure 3.3). In the construction

17 The credit grade is weighted by the amount of the borrowers' credit risk.

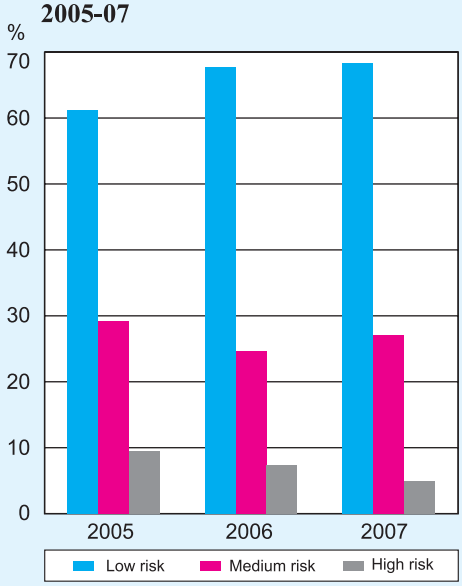
18 Borrowers with a high probability of default.

19 See section d. in this Chapter for further details.

20 Except for the manufacturing industry, the electricity and water industry, and non-housing loans.

and real estate industry, the proportion of problem loans to outstanding credit fell during the year, to a level of 8.2 percent (Table 3.3). The ratio of the loan-loss provision to outstanding credit fell by 0.28 percentage point to 0.29 percent (Table 3.3) and the industry's average credit rating remained stable (Figure 3.3).

Figure 3.4
Distribution of Credit Risk Ratings by Risk Level in the Five Major Banks, 2005-07



SOURCE: Reports to the Supervisor of Banks-Report on Large Risk Credit Exposures.

Despite the improvement in the construction and real estate industry's credit quality, the impact of the global crisis on companies in the real estate industry was very notable in 2007, because of the industry's exposure to real estate investments abroad and its major reliance on finance by means of debt instruments (Part of it from the capital market). As a result, the credit risk of these borrowers increased and was reflected by the large drop in the prices of real estate stocks in the second half of the year and by the large rise in the industry's risk premium. Due to the global crisis, balance-sheet credit to the real estate industry expanded considerably, leading to a large decrease in the number and volume of issues[21] on the Tel Aviv Stock Exchange, mainly among unrated companies (Figure 3.5).

In the private individuals sector,[22] which is notable for extensive diversification and a low correlation, credit risk is expected to be low compared with the other principle industries. The continued increase in real wages and the large decline in the unemployment rate, which reached its lowest level for a decade, continued to favorably impact borrowers' repayment ability in 2007. The continuation of the downtrend in the proportion of problem loans (housing and non-housing loans), which began in 2004 (Table 3.3 and Figure 3.6) and the reduction in the provision for housing loans (Table 3.3, Figure 3.7) reflected the decrease in private individuals' credit risk. The provision in respect of non-housing loans increased slightly although the rate of the provision remained lower than in 2002-2003. This was because favorable background conditions made it possible to sustain a large growth in credit while maintaining a stable level of credit risk (Table 3.3, Figure 3.7).

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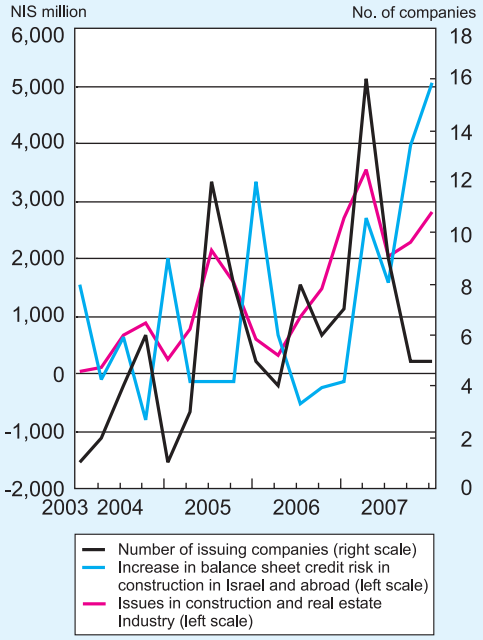
[21] Because of a large issue by one of the real estate companies in that period, the decrease in the volume of issues during the second half of 2007 was not clearly apparent (Figure 3.5).

[22] This sector includes the households sector and the private banking sector, as reported in Appendix F to the financial statements.

To conclude, the positive developments in the Israeli economy during recent years contributed to an improvement in the quality of bank credit in 2007, concurrent with an improvement in borrowers' repayment ability and the quality of collateral. The financial crisis, which impacted the capital market indices,[23] was not reflected in the indices based on companies' financial statements. But the financial crisis is not yet over and a more serious effect on the economy at later stage is feared – directly, via the financial system in Israel and indirectly, via the global economic slowdown.

Figure 3.5
Bond Issues on the Tel Aviv Stock Exchange, and Changes in Balance Sheet Credit Due to Borrowers' Real Estate Activity in Israel and Abroad, December 2003 to December 2007



SOURCE: Bank of Israel Monetary Department and published financial statements.

c. The concentration of the credit portfolio

A high concentration of the credit portfolio reflects a bank's inability to diversify the risk inherent in its portfolio between customers in a suitable manner. In this survey, the concentration of a bank's credit portfolio is estimated in two ways: (1) by principal industries[24] – the more diversified is the credit portfolio among the principal industries, the lower will be the credit risk deriving from concentration in the portfolio; (2) by size of borrower – the more widely diversified is the credit portfolio among the different borrowers, the smaller will be the exposure to credit risk and vice versa. This is detailed below.

[23] See section 6 in this Chapter for more details.

[24] Concentration by principal industry is examined on the assumption that there is no complete correlation in the activity volumes and business results, between borrowers in different industries.

Table 3.3
Distribution of Credit by Principal Industry, The Five Major Banking Groups, 2006-07

	Balance of credit to public[a]		Change in balance of credit	Distribution of credit balance		Problem loans: Balance		Problem loans: Share in total credit		Annual specific loan-loss provision		Loan-loss provision/total credit	
	2006	2007	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	(NIS million)			(percent)		(NIS million)		(percent)		(NIS million)		(percent)	
Agriculture	6,692	7,345	653	0.7	0.7	771	528	11.5	7.2	-13	-14	-0.19	-0.19
Manufacturing	138,038	147,736	9,698	14.2	13.8	10,421	9,033	7.5	6.1	395	526	0.29	0.36
Construction and real estate[b]	152,383	175,476	23,093	15.7	16.4	18,328	14,472	12.0	8.2	962	505	0.63	0.29
Water and electricity	12,575	12,209	-366	1.3	1.1	59	16	0.5	0.1	-10	1	-0.08	0.01
Commerce	85,858	92,522	6,664	8.8	8.6	3,847	2,919	4.5	3.2	314	259	0.37	0.28
Tourism[c]	18,642	19,414	772	1.9	1.8	4,648	3,962	24.9	20.4	-13	-27	-0.07	-0.14
Transport and storage	21,049	22,055	1,006	2.2	2.1	1,039	772	4.9	3.5	64	23	0.30	0.10
Communications and computer services	23,575	22,545	-1,030	2.4	2.1	2,289	2,008	9.7	8.9	231	77	0.98	0.34
Financial services	158,093	186,541	28,448	16.3	17.4	3,180	2,068	2.0	1.1	122	-185	0.08	-0.10
Other business services	36,871	44,967	8,096	3.8	4.2	1,255	1,064	3.4	2.4	156	140	0.42	0.31
Public and community services	23,748	24,231	483	2.4	2.3	1,623	1,372	6.8	5.7	54	-1	0.23	0.00
Individuals	293,127	317,504	24,377	30.2	29.6	7,723	7,281	2.6	2.3	899	727	0.31	0.23
of which: housing loans	121,459	133,088	11,629	12.5	12.4	4,551	4,077	3.7	3.1	391	159	0.32	0.12
of which: non-housing loans	171,668	184,416	12,748	17.7	17.2	3,172	3,204	1.8	1.7	508	568	0.30	0.31
Total	**970,651**	**1,072,545**	**101,894**	**100.0**	**100.0**	**55,183**	**45,495**	**5.7**	**4.2**	**3,161**	**2,031**	**0.33**	**0.19**
Municipalities	8,634	8,928	294	0.9	0.8	419	257	4.9	2.9	3	-2	0.03	-0.02

[a] Including outstanding credit to the public, the public's investment in bonds, other assets in respect of derivatives and the credit value equivalent of off-balance-sheet items in respect of borrowers' activity in Israel and abroad. Due to the lack of data relating to the Mizrahi-Tefahot group's outstanding by-industry credit in respect of borrowers' activity abroad, it is assumed that the distribution of the group's credit for this activity is identical to the distribution in the other four groups.

[b] The data for this industry are calculated without regard to the industry concentration limitation.

[c] Hotels, catering and accommodation.

SOURCE: Published financial statements.

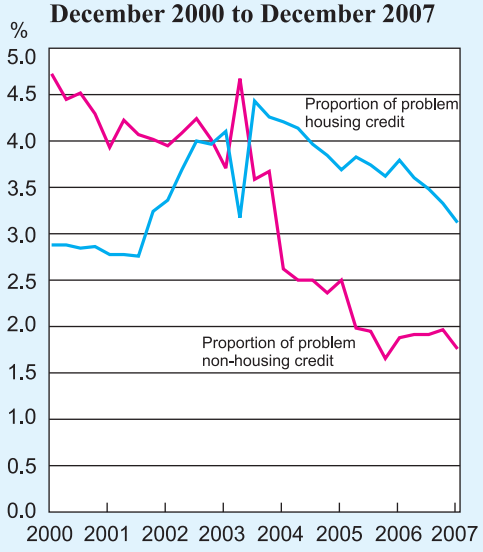
Table 3.4
Indices of Concentration in Public's Credit Portfolio, The Five Major Banking Groups, 2004–07[a]

		Hapoalim	Leumi	Discount	Mizrahi–Tefahot	First Intl.	The five groups
Concentration by principal industry							
Herfindahl-Hirschman (H) Index of concentration in the total credit portfolio[b]	2004	0.179	0.163	0.146	0.327	0.170	0.172
	2005	0.183	0.162	0.147	0.355	0.156	0.173
	2006	0.184	0.165	0.151	0.309	0.168	0.174
	2007	0.182	0.172	0.148	0.315	0.174	0.175
H-Index of concentration in the business credit portfolio[c]	2004	0.161	0.164	0.162	0.210	0.179	0.165
	2005	0.168	0.167	0.163	0.226	0.180	0.167
	2006	0.182	0.170	0.168	0.217	0.181	0.170
	2007	0.188	0.176	0.168	0.208	0.192	0.176
H-Index of concentration in the total credit portfolio excluding credit to individuals[d]	2004	0.073	0.085	0.100	0.054	0.116	0.080
	2005	0.076	0.089	0.100	0.051	0.114	0.081
	2006	0.085	0.089	0.103	0.053	0.098	0.083
	2007	0.092	0.090	0.107	0.049	0.103	0.087
Credit to individuals as percentage of total credit	2004	32.4	27.9	21.5	51.7	20.4	30.2
	2005	32.7	27.0	21.8	54.7	20.4	30.2
	2006	31.4	27.7	22.0	50.6	26.5	30.2
	2007	30.1	28.6	20.0	51.6	26.7	29.6
Concentration by borrower size							
Gini index of credit diversification by borrower size[e]	2004	0.887	0.910	0.896	0.809	0.929	0.893
	2005	0.891	0.912	0.900	0.798	0.929	0.896
	2006	0.886	0.905	0.901	0.798	0.903	0.891
	2007	0.886	0.907	0.915	0.806	0.897	0.896
Share in the group's total credit of credit given to borrowers whose indebtedness exceeds NIS 40 million (%)	2004	45.0	42.9	42.6	23.9	45.4	41.9
	2005	49.2	43.8	43.8	22.7	46.0	43.9
	2006	51.6	41.9	44.8	26.0	41.5	44.3
	2007	52.6	41.5	49.2	23.8	41.0	45.2
Share in total credit of borrowers whose indebtedness exceeds five percent of the group's equity[f] (percent)	2004	6.2	4.7	8.7	8.6	20.7	
	2005	9.3	6.5	7.8	5.8	18.5	
	2006	8.3	5.0	8.6	6.5	14.0	
	2007	8.5	6.1	11.4	5.6	15.0	

[a] On balance-sheet and off-balance-sheet basis.
[b] This index is the sum of the squares of the weights of the credit in an industry (including credit to individuals) in total credit to the public (including credit to individuals).
[c] This index is the sum of the squares of the weights of the credit in an industry (excluding credit to individuals) in total credit to the public (excluding credit to individuals).
[d] This index is the sum of the squares of the weights of the credit in an industry (excluding credit to individuals) in total credit to the public (including credit to individuals).
[e] The Gini index reflects the inequality of the distribution of credit by borrower.
[f] Plus minority shareholders' rights.

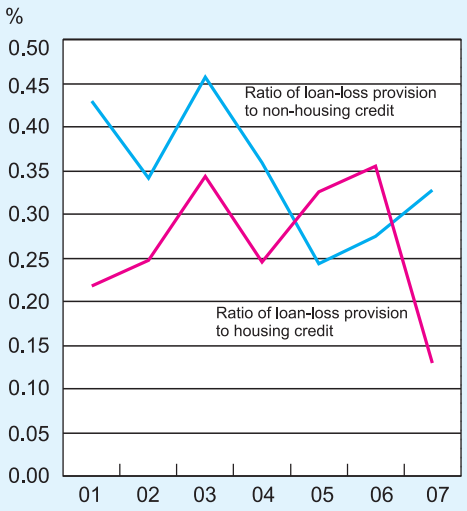
SOURCE: Based on published financial statements.

Figure 3.6
Problem Credit as a Proportion of Total Credit to Individuals, the Five Major Banking Groups, December 2000 to December 2007



SOURCE: Published financial statements.

Figure 3.7
Ratio of Specific Loan-Loss Provision to the Balance of Credit to Individuals, 2001-07



SOURCE: Published financial statements.

(1) The concentration of the credit portfolio by principal industries[25]

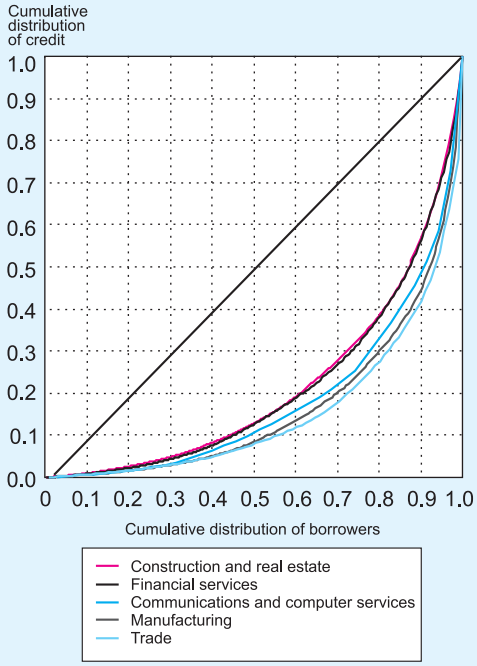
A deterioration in the concentration of the credit portfolio by principal industries was recorded in 2007. The deterioration was reflected by a rise in the Herfindahl concentration index for the aggregate credit portfolio, excluding credit to private individuals,[26] and by an increase in the Herfindahl business credit portfolio concentration index (Table 3.4). The deterioration in the indices is attributed to the increased share of two industries that are dominant in the business credit portfolio – the financial services industry and the construction and real estate industry – which together account for approximately half of the business credit portfolio (Table 3.3). The increased share of the financial services industry is part of an upturn that began in 2001, from 13 percent in December 2000

[25] The principal industries are those detailed in Table 3.3, except for credit to private individuals. The credit portfolio contains outstanding credit to the public, the public's investments in shares, others assets in respect of derivative instruments and the credit value equivalent of off-balance-sheet items in respect of borrowers' activity in Israel and abroad.

[26] Private individuals, whose proportion to total credit amounted to 29.6 percent in 2007, are very heterogeneous – the correlation between private individuals is low – while the correlation between this credit and total credit to the economy is high and should not therefore be defined as an industry. For more details, see H. Bar, A. Barnea and Y. Landskroner (1998), "Consumer Credit – its Characteristics and the Risk Inherent in it," Discussion Paper 98.03, Banking Supervision Department, Research Unit.

to 25 percent in December 2007. Most of the increase in the financial services sector derived from the expansion in the activity of investment houses, and from the sale of the provident funds and the mutual funds under the implementation of the Bachar Reform and the resulting credit lines which the banks extended to the purchasers of the funds. The increase in the share of the construction and real estate industry followed several years when real estate companies had raised debt via non-bank sources. As a result of the global financial crisis in the second half of the year, real estate companies reduced the amount of capital raised by means of bond issues on the Tel Aviv Stock Exchange and increased their uptake of bank credit. Both the financial services industry and the construction and real estate industry are notable for greater diversification than other industries, as reflected by the Gini index, which expresses inequality in the distribution of sector-specific credit:[27] In 2007 the index amounted to 0.57 and 0.58 in the construction and real estate industry and the financial services industry respectively, compared with 0.67 in the manufacturing industry and 0.69 in the commerce industry (Figure 3.8). The diversification in the financial services industry and the construction and real estate industry slightly moderates the impact on credit concentration of the increase in these industries' share.

Figure 3.8
The Gini Index of Credit Distribution by Borrower Size in Different Industries, the Five Major Banking Groups, December 2007



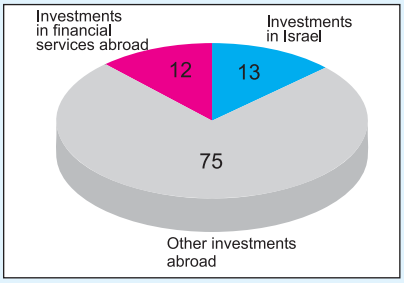
SOURCE: Reports to the Supervisor of Banks-Report on Large Risk Credit Exposures.

An analysis of the concentration of the public's bond investments, which account for 6 percent of balance-sheet credit to the public, shows that the investment portfolio is notable for high concentration. 75 percent of the public's bond investments are in the financial services industry abroad (Figure 3.9).

[27] This index is estimated by calculating the area between the credit portfolio distribution curve (the cumulative percentage of credit to the cumulative percentage of borrowers) and 45 degrees, which reflects equal distribution, and its value ranges from 0 (complete equality) to 1 (maximum inequality). The analysis is based on the credit exposure report.

The onset of the global financial crisis in the second half of the year and the high proportion of investment in that industry to total bonds of the public led to a rise in the credit risk of part of the banks.[28]

Figure 3.9
Distribution of the Investments in Corporate Bonds, the Five Major Banking Groups



SOURCE: Reports to the Supervisor of Banks.

(2) Credit concentration by borrower size

Another index employed for examining the concentration of the credit portfolio is the extent of the portfolio's diversification between different borrowers. The banks' credit portfolio is notable for high concentration by borrowers: The credit risk of the ten largest borrowers was equivalent to 4.1 percent of total credit risk and 73.4 percent of shareholders' equity in 2007, and the proportion of the six largest borrowers groups amounted to 9.4 percent of total credit risk and 160 percent of shareholders' equity.[29] Although large business firms increased their bond issues on the Tel Aviv Stock Exchange in recent years, which favorably affected the distribution of the bank credit portfolio,[30] the proportion of large borrowers in the banking system remained high.

The increase in the concentration of the credit portfolio by borrower size in 2007 was expressed by a number of indices: The Gini index of credit portfolio diversification by borrower size at the five largest banking groups rose slightly during the year, from 0.891 to 0.896 (Table 3.4), because the rate of expansion in business credit exceeded that in credit to private individuals – a group notable for high diversification among small borrowers.[31] The changes in the composition of the credit portfolio in 2007 followed several years of a static level of business credit and a large increase in credit to private individuals resulting from the increased availability of non-bank credit substitutes for business firms concurrent with the lack of such credit substitutes for private individuals. The proportion of credit to large borrowers with an obligo in excess of NIS 40 million to total credit rose by one percentage point (Table 3.4). The proportion of credit to the ten largest and six largest borrowers to total credit increased by 0.5 percentage point and 0.2 percentage point respectively.

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[28] See Box 3.1 for further details.

[29] Source: Credit exposure report.

[30] For further details on this subject, see M. Zilberberg and D. Ruthenberg (2008), "Characteristics of Business Firms with Indebtedness to the Bank which Issued Bonds on the Tel Aviv Stock Exchange in Recent Years," Bank of Israel, Banking Supervision Department, Research Unit, Discussion Paper 08.01.

[31] See Chapter 1 for more details.

2. MARKET RISK

a. General

Market risk is defined as the risk of erosion in a bank's net work due to unexpected changes in market prices (interest rates, share prices, the exchange rate and inflation).

The analysis of market risks in this survey is based on Value at Risk (VaR). This value expresses the maximum loss to be expected on the holding of financial instruments that are sensitive to changes in market prices for a given planning horizon and a given confidence level at a particular point in time. In this section VaR is calculated in respect of the interest-rate risks in the three indexation segments (the unindexed local currency segment, the CPI-indexed segment and the foreign currency segment) and in respect of indexation base risks (exchange rates and inflation), by means of the normal distribution approach, which is based on the following assumptions: (1) a normal distribution of risk factors;[32] (2) a planning horizon of 10 days; (3) a confidence level of 99 percent; (4) no account is taken of correlations between changes in different market prices; (5) daily data for the past year are used; (6) the positions are based on the data presented in the bank's financial statements (including the effect of futures transactions).

b. Interest-rate risks

(1) General

Interest-rate risk is the risk that unexpected changes in interest rates will cause a bank's financial position to deteriorate (or will reduce the bank's net worth[33]). This risk arises when the relative sensitivity of the bank's assets to unexpected changes in interest rates differs from that of its liabilities. The exposure to interest-rate risk, which is reflected

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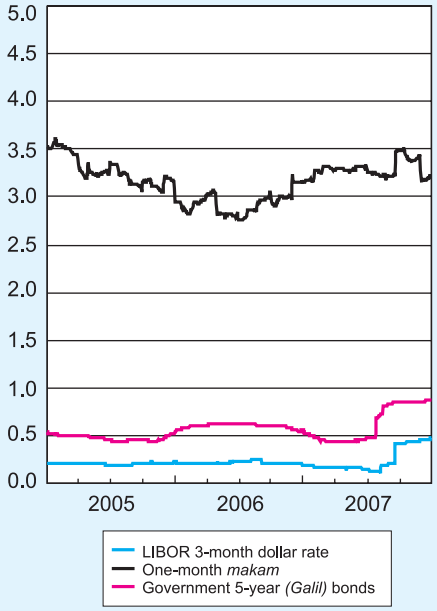
[32] There are two other approaches for estimating VaR: the Monte Carlo simulations approach and the historical simulations approach. The former is built on a specific distribution while the latter does not assume the existence of a specific model, and is based on the prices of assets in the past. Each of the methods has its advantages and disadvantages. The Monte Carlo simulations approach is difficult to apply and the risk inherent in it is that the distribution selected for a scenario may not reflect the future. The historical simulations approach requires a long data-sampling period in order to calculate VaR over a time interval. As an example, in order to calculate VaR over 10 days, a data base ten times larger than that required in the normal approach is necessary. This approach could be heavily affected by past events. The normal distribution approach assumes that daily yields are not interdependent, with the result that a change in prices over a period of 10 days is distributed normally with an average and variability equal to 10 times the average and the daily variability. It should be noted that the assumption of the normality of changes in each of the risk factors is reasonable (if not accurate) – except in the case of options, which do not behave normally, but it is assumed that the gap between this behavior and normal behavior is not significant.

[33] The economic value of a bank's financial capital (net worth) is calculated by means of the difference between the present value of assets and the present value of liabilities. The present value of assets and liabilities is obtained by discounting the future flow (principal and interest) by the market interest rate in accordance with the timing structure of the relevant interest rates for each segment, i.e., for every asset and liability with a similar duration.

by the VaR of the bank's positions[34], is affected by three elements: (1) the difference between the present value of assets and the present value of liabilities plus the effect of futures transactions (hereinafter: the position);[35] (2) the position's sensitivity to changes in interest rates, which is measured via duration (average term to maturity), or adjusted duration; (3) the maximum change in the interest rate during the planning horizon. The first two elements are dependent on the distribution of the assets and liabilities of each and every bank and their characteristics over time, while the third is uniform for all of them since it is derived from the volatility in interest rates.

Figure 3.10
Standard Deviation[a] of Changes in Selected Interest Rates, 2005-07



[a] Calculated on a daily basis over the previous year.
SOURCE: Bank of Israel.

(2) Value at interest-rate risk

Total value at interest-rate risk rose during the year at most of the banking groups except the First International, and amounted to NIS 2.4 billion compared with NIS 2.0 billion in 2006 (Table 3.5). The value at interest-rate risk at the five banking groups ranged between 3.4 percent and 5.8 percent of net worth except at the Discount group, where the ratio was particularly high and amounted to 23.5 percent.

Most of the growth in the value at interest-rate risk during 2007 was recorded in the foreign-currency segment. The value at interest-rate risk in the foreign-currency segment is generally lower than in the local currency segments due to the banks' policy of maintaining

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[34] This value is the change expected in the economic value of a position in the event of the maximum change expected in the interest rate, and is calculated by means of the following equation:

$$VaR_p = P \cdot \frac{D_k}{(1+i)} \cdot \Delta(1+i)$$

where P – the position, D_k – the duration of the economic value of the bank's capital , i – the discount interest rate and $\Delta(1+i)$ – the maximum change in the interest rate at a probability of 99 percent (that is, the change in the interest rate will be less than it at a probability of 99 percent and greater than it at a probability of 1 percent). The second term on the right-hand side of the equation is the adjusted duration of the capital. The longer is the adjusted duration of an asset, the larger will the change in the asset's present value resulting from an interest rate adjustment, and thereby reflects a high interest-rate risk. See Table 3.5 for details.

[35] Based on the accounting report in Appendix D to the published annual report.

Table 3.5
Exposure to Changes in Interest Rates, the Five Major Banking Groups, 2006-07

	Hapoalim		Leumi		Discount		Mizrahi-Tefahot		First International	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Unindexed segment										
Total exposure[a] (NIS million)	2,841	6,897	5,613	7,003	1,493	3,608	1,996	2,172	792	3,505
Duration of assets (years)	0.60	0.50	0.55	0.50	0.77	0.55	0.38	0.34	0.55	0.33
Duration of liabilities (years)	0.28	0.27	0.27	0.26	0.22	1.17	0.22	0.23	0.19	0.17
Duration gap[b] (D_{gap}) (years)	0.32	0.24	0.29	0.25	0.56	-0.56	0.17	0.12	0.37	0.17
Modified duration of capital[c] (percent)	11.46	4.42	5.22	3.90	20.74	-13.03	3.07	2.19	20.05	2.31
Maximum change of interest[d] (percentage points)	1.47	1.50	1.47	1.50	1.47	-1.50	1.47	1.50	1.47	1.50
Value at risk[e] (VaR)	480	457	432	409	456	704	90	71	234	121
Indexed segment[f]										
Total exposure[a] (NIS million)	9,389	8,254	5,023	6,719	2,087	2,032	1,797	2,827	1,641	579
Duration of assets (years)	3.98	3.99	4.09	3.89	4.80	5.22	3.91	3.88	4.32	4.14
Duration of liabilities (years)	4.81	4.59	4.01	3.78	4.58	4.93	3.62	3.94	3.53	3.12
Duration gap[b] (D_{gap}) (years)	-0.07	-0.02	0.41	0.50	0.65	0.69	0.47	0.23	1.14	1.12
Modified duration of capital[c] (percent)	-0.44	-0.18	4.77	4.72	6.74	8.19	9.32	3.07	11.34	34.42
Maximum change of interest[d] (percentage points)	-0.26	-0.40	0.26	0.40	0.26	0.40	0.26	0.40	0.26	0.40
Value at risk[e] (VaR)	11	6	62	128	36	67	43	35	48	80
Foreign-currency segment[g]										
Total exposure[a] (NIS million)	2,340	1,163	353	-3,018	-335	-1,669	139	-219	-185	-231
Duration of assets (years)	0.96	1.33	0.54	0.62	1.04	1.24	0.55	0.50	0.41	0.28
Duration of liabilities (years)	0.84	1.00	0.47	0.31	0.52	0.22	0.32	0.77	0.47	0.22
Duration Gap[b] (Dgap) (years)	0.13	0.34	0.07	0.30	0.52	1.02	0.23	-0.27	-0.06	0.06
Modified duration of capital[c] (percent)	7.05	37.16	25.51	12.58	115.03	43.99	41.46	-28.85	-8.37	6.96
Maximum change of interest[d] (percentage points)	0.08	0.22	0.08	0.22	0.08	0.22	0.08	-0.22	-0.08	0.22
Value at Risk[e] (VaR)	14	95	8	84	32	162	5	14	1	4

(cont'd.)

Table 3.5 (cont'd.)
Exposure to Changes in Interest Rates, the Five Major Banking Groups, 2006-07

	Hapoalim		Leumi		Discount		Mizrahi-Tefahot		First International	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Net worth[h] (NIS million)	14,570	16,313	10,990	10,704	3,245	3,970	3,932	4,781	2,248	3,852
Total value at risk[i] (NIS million)	505	558	501	620	525	933	138	120	283	205
As percent of net worth	3.46	3.42	4.56	5.80	16.18	23.50	3.52	2.51	12.60	5.32

[a] Present value of assets less present value of liabilities including effect of futures and options. The present value of the assets and liabilities are obtained by discounting the future cash flow (principal and interest) at the market interest rate according to the time structure of the interest rate relevant in each segment.

[b] The duration gap measures the sensitivity of a bank's net worth to changes in the interest rate in terms of time, and thus enables it to calculate the average duration of the assets/liabilities that should be bought/sold to immunize itself against interest risk. It is calculated as $D_{gap} = D_A - D_L \cdot L/A$, where D_A is the average duration of assets, D_L is the average duration of liabilities, A is the current value of assets, and L is the current value of liabilities.

[c] The modified duration of capital is calculated as $D_k/(1+i)$, where $D_k = D_{gap} \cdot A/L$, the average duration of the bank's net worth, and i is the interest rate. The modified duration may also be taken as the rate of exposure of a position to a one-percentage-point change in the interest rate. When its sign is positive, an unexpected rise in the interest rate will reduce net worth, and a drop in the interest rate will increase net worth, and vice versa when the sign is negative.

[d] The maximum change in the yield to maturity on one-month *makam* in the unindexed segment, on five-year indexed bonds in the indexed segment, and on three-month Libor in the foreign currency segment is derived from the daily changes in the previous year, assuming a normal distribution, at the 99% significance/ confidence? level.

[e] The change in a bank's situation that would result from the maximum change in the interest rates, calculated from the VaR model: $VaR = P \cdot [D_k/(1+i)] \cdot \Delta(1+i)$, where, P is the position, D_k is the average duration of the bank's net worth, i is capitalization interest, and $\Delta(1+i)$ is the maximum change in the capitalization interest.

[f] Including the CPI/$ indexation option.

[g] Including foreign-currency-indexed.

[h] Total present value of assets less present value of liabilities including effect of futures and options for all segments.

[i] The total value subject to interest rate risk obtained by simply adding the adjusted value at risk in the three segments under the strong assumption of the worst scenario, from the bank's point of view, in all the segments.

SOURCE: Based on published financial statements.

small positions and the low volatility of the interest rate in it, as reflected by the implied volatility of the Libor interest rate (Figure 3.10). In 2007 however, the positions at the Leumi and Discount groups increased and interest-rate volatility rose during the second half of the year because of the Fed's rate cut, which was aimed at weakening the impact of the credit crunch.

In the unindexed local currency segment, the value at interest-rate risk fell at most of the banking groups, despite the increased position, due to a contraction of the duration gap, The price in that segment, which is derived from volatility in the yields-to-maturity of Treasury bills (Makam), did not change compared with 2006 and remained high relative to the CPI-indexed segment and the foreign-currency segment (Figure 3.10).

c. Indexation-base risks

(1) General

Exposure to indexation-base risk is affected by two elements: One element is the quantity effect – the difference between the value of assets and the value of liabilities, plus the net effect of futures transactions (hereinafter: the position).[36] The other element, the price effect, is an unexpected change in the relative prices between the different indexation segments. The analysis in this survey is centered on the three indexation segments alone (without reference to diverse foreign currencies), on the assumption that financial capital is defined as unindexed. Accordingly, market risk in the CPI-indexed local currency segment materializes in the event of an unexpected decrease in prices (deflation) that erodes its liabilities (when the value of the liabilities is higher than the value of the assets. Similarly, market risk in the foreign-currency segment materializes when an unexpected rise in the nominal exchange rate of the shekel against the dollar (a deprecation) erodes a bank's liabilities, when the value of liabilities exceeds the value of assets, and when an unexpected fall in the exchange rate (an appreciation) erodes the bank's assets when the value of assets exceeds the value of liabilities.

The consumer price index rose by 3.4 percent in 2007, above the upper limit of the level defined as price stability (1 percent to 3 percent). The deviation from the upper limit of price stability and from the inflation expectations derived from the capital market (break-even inflation), which amounted to 1 percent at the beginning of the year, had the effect of increasing the net worth of the five large banking groups, which had a surplus of assets over liabilities in the CPI-indexed segment (Table 3.6). The 9.0 percent strengthening of the shekel against the dollar during 2007 concurrent with the five largest banking groups' liability surplus in the foreign-currency segment also led to an increase in net worth, although its impact was less notable because of the small positions in that segment at most of the banks. In 2007 the level of risk rose compared with the previous year, reflecting the high implied volatility of the exchange rate of the shekel against the dollar and price developments in the Israeli economy (Figure 3.11).

[36] On the basis of Note 16 to the published annual report.

Table 3.6
Exposure to Changes in CPI and the Exchange Rate, the Five Major Banking Groups, December 2006 and December 2007

(NIS million)

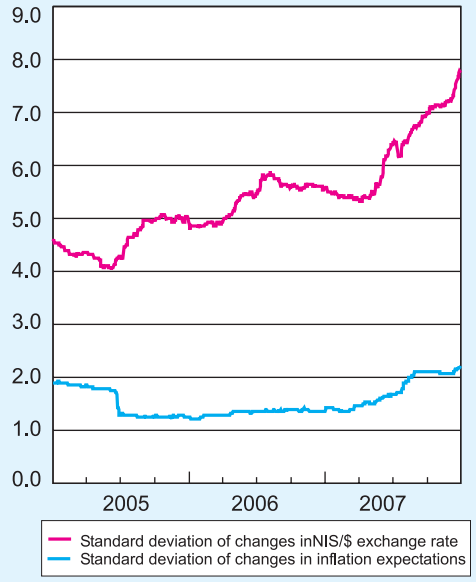
	Hapoalim		Leumi		Discount		Mizrahi-Tefahot		First International	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Unindexed segment										
Assets *minus* liabilities	-11,366	-12,180	-7,025	-2,537	-1,028	3,236	-8,167	-6,551	-5,198	-3,480
Effect of futures and options	15,194	19,755	13,097	10,822	3,052	613	10,440	8,929	6,704	6,809
Net worth[a]	12,298	12,963	9,202	9,246	2,950	2,642	3,471	4,029	2,357	3,039
Total position in segment[b]	-8,470	-5,388	-3,130	-961	-926	1,207	-1,198	-1,651	-851	290
Indexed segment[c]										
Assets *minus* liabilities	14,067	19,376	8,088	13,441	1,936	3,971	6,431	7,078	4,100	3,424
Effect of futures and options	-6,879	-13,843	-4,911	-10,035	-738	-3,064	-5,410	-5,220	-3,057	-3,395
Total position in segment	7,188	5,533	3,177	3,406	1,198	907	1,021	1,858	1,043	29
Change in CPI[d] (percent)	-0.63	-1.03	-0.63	-1.03	-0.63	-1.03	-0.63	-1.03	-0.63	-1.03
Value at risk[e]	45	57	20	35	8	9	6	19	7	0
Foreign-currency segment[f]										
Assets minus liabilities	9,597	5,767	8,139	-1,658	2,044	-4,565	5,207	3,496	3,455	3,095
Effect of futures and options	-8,315	-5,912	-8,186	-787	-2,316	2,451	-5,030	-3,703	-3,647	-3,414
Total position in segment	1,282	-145	-47	-2,445	-272	-2,114	177	-207	-192	-319
Change in real exchange rate[g] (percent)	-2.59	3.62	2.59	3.62	2.59	3.62	-2.59	3.62	2.59	3.62
Value at risk[e]	33	5	1	88	7	76	5	7	5	12
Total VaR from indexation-base risk[i]	78.6	62.0	21.3	123.4	14.6	85.8	11.0	26.5	11.6	11.8
As percent of net worth	0.64	0.48	0.23	1.33	0.50	3.25	0.32	0.66	0.49	0.39

[a] The bank's net worth is ascribed (by definition) to the unindexed segment, so that nominal exposure to indexation bases occurs in the indexed and foreign currency segments.
[b] The difference between the current value of assets and the current value of liabilities includes the effect of forward transactions minus the net worth of the bank.
[c] Including the CPI/$ indexation option.
[d] The maximum change in the CPI that was derived from the distribution of changes in that index during the last five years. The probability of a change greater than that is smaller than 1%.
[e] The change in the bank's situation as a result of the maximum change in the CPI and the foreign exchange rate calculated according to the VaR model.
[f] Including foreign currency indexed.
[g] The maximum change in the nominal foreign exchange rate of the dollar against the shekel which is derived from the distribution of changes in this index during the last five years. The probability of a change greater than that is smaller than 1%.
[i] The total VaR subject to indexation base risk obtained by the simple addition of the values subject to risk in the unindexed and foreign currency segments under the assumption that the worst scenario, from the bank's point of view, occurs in the two sectors.
SOURCE: Based on published financial statements and Central Bureau of Statistics data.

(2) Value at indexation base risk

The value at indexation-base risk increased in 2007 and amounted to NIS 309 million, less than the value at interest-rate risk. The increase in VaR occurred principally at the Leumi and Discount groups, because of their larger positions in the foreign-currency segment, where positions are usually low. The higher VaR at all of the banking groups also resulted from an increase in the price risk during 2007, reflecting the implied volatility of price changes in the Israeli economy and the implied volatility of the exchange rate of the shekel against the dollar (Figure 3.11).

Figure 3.11
Standard Deviation[a] of the NIS/$ Exchange Rate and of Changes in Inflation Expectations, 2005-07



[a] Calculated on a daily basis over the previous year.
SOURCE: Bank of Israel.

3. OPERATIONAL RISK

Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. This definition includes legal risk, but excludes strategic risk and reputational risk.[37]

Operational loss events involve a potential for appreciable additional losses, due inter alia to: embezzlement, fraud, improper transaction practices and safety at the work place, problems involving customers, products and business practices, damage to physical assets, disruptions in business activity and failures in performance, distribution and managerial processes.

For the purpose of assessing the banks' capital requirements in respect of operational risk, the Basel II recommendations permit the use of three possible approaches: the Basic Indicator Approach (BIA); the standardized approach (TSA) or alternatively, the Alternative Standardized Approach (ASA); and the Advanced Measurement Approach (AMA).[38]

As Chapter of the application of Basel II in Israel from December 2009, the banks will be required to allocate capital against operational risks and detect potential focuses for the materialization of this risk. In accordance with a decision by the Supervisor of Banks, a banking corporation will be entitled to apply the Basic Indicator Approach if

[37] Basel II, Revised Framework, June 2006, paragraph 644.

[38] See Israel's Banking System, Annual Survey 2006, pp 100–102 for more details.

it fulfills two conditions: One condition is that its shareholders' equity is less than NIS 4 billion. The other condition is that it does not have material international activity. A banking corporation that does not meet these conditions will be permitted to apply the BIA approach for a period of up to thee years from the initial date of application. In addition, a banking corporation that allocates capital in respect of credit risk by means of advanced IRB approaches will not be permitted to apply the BIA approach. Banks may apply the Alternative Standardized Approach under certain conditions.[39] The internal estimates approach is not permitted for use at this stage.[40]

A number of operational risks were realized in the banking system during 2007. Two major events created legal risks: (1) The Heftsiba company episode, as a result of which the banks involved recorded overall provisions of NIS 290 million; (2) The filing of a class action that was approved by the Tel Aviv District Court against a number of banks in January, claiming that the banks had coordinated their interest rates and fees. In 2007 the Banking Supervision Department changed the manner in which it deals with violations of the Prohibition of Money Laundering Law: In the past, the Banking Supervision Department imposed a large monetary fine of up to NIS 2 million only when an inspection report was issued on the violation. Since 2007, the Banking Supervision Department has imposed a fine in the case of any violation of the Law. As a result, the operational risk connected with violation of the Prohibition of Money Laundering Law has increased. In 2007 sanctions were taken against three banks due to violations of the Law.[41] A number of specific cases were recorded in which the banks were exposed to operational risks in the area of customer activity on the Internet.

4. LIQUIDITY RISK

Liquidity risk derives from a banking corporation's uncertainty regarding the extent of the public's withdrawals from its deposits, from the expectation that deposits will not be renewed once their contractual repayment date is due, and from unexpected demand for credit. The materialization of this risk could cause a shortage of liquidity for the bank, as the result of which it will have to sell assets at less than the market price and/or raise sources in the secondary market, such as interbank loans and loans from the Bank of Israel (monetary loans) at more than the market price. Accordingly, liquidity risk, which is a short-term risk, is mainly apparent in Israel in the unindexed local currency segment and in the foreign currency segment, where balance sheet items without a predetermined contractual repayment date exist (e.g., demand deposits, SROs,

[39] Banks will only be permitted to apply this approach if their income from the retail and corporate segments is at least 90 percent of their total income, and the probability of default (PD) is more than 3.5 percent.

[40] http://www.boi.gov.il/deptdata/pikuah/basel/h_letter_13022008.pdf (Hebrew).

[41] Bank Leumi, the First International Bank and Bank Poalei Agudat Israel.

and current loan accounts), as well as short-term deposits whose repayment dates are uncertain.

A banking corporation is required to develop an internal model for the reliable measurement of the liquid sources available to it and its liquidity requirements to ensure that it has enough liquid sources to cover its liquidity requirements during the coming month. If the banking corporation does not use an internal model, it will be required to hold liquid assets worth at least as much as its liabilities for terms of maturity of up to a month.[42]

Since the standard model is a rough model, with a very high liquid assets requirement, liquidity risk is measured and managed in the Israeli banking system by means of internal models, which estimate liquidity risk under different scenarios. The internal models developed by the banks differ in their working assumptions and calculation methods, and are derived from the characteristics of different customer bases. These models take account of additional elements such as the extent of the bank's reliance on large depositors (depositor concentration), the bank's ability to obtain credit lines from foreign banks and its parent bank, the composition of its securities portfolio, and its reputation. The banks use these internal models to calculate their liquidity requirements, taking into account the statistically calculated rate at which deposits will be rolled over, estimated credit activity and other expenses such as salary payments. At the same time, the models calculate the ability to realize specific assets, principally from the securities portfolio. On the basis of these estimates, the banks calculate their liquidity indices daily. These indices are the liquidity gap by terms to maturity (a day, up to a week, up to a month, up to three months, up to six months, up to a year, over a year) and the ratio of liquid assets to liabilities for a repayment period of up to a month for each of the indexation segments. These models need to refer to three extreme scenarios (a normal situation, a crisis at the bank and a general systemic crisis) and to define triggers for these situations. In order to test the reliability of the models, the banks must conduct stress tests and back tests, and determine restrictions for the extreme scenarios connected with a crisis situation at the bank, or a general crisis such as war, a political shock, a shock in the financial markets and an economic crisis. These tests make it possible to examine how the bank would be able to function for a month in a crisis situation, at a reasonable cost.

In 2007 the banks in Israel increased their holdings of bonds (Figure 1.15), which are highly liquid assets, and reduced their deposits at the Bank of Israel, on which the yield is lower.

The Real Time Gross Settlement (RTGS) System for the settlement of large payments (known by its Hebrew acronym, Zahav) was launched in 2007. The Zahav system makes it necessary for the banks in Israel to monitor their ability to maintain a suitable level of liquidity on a current basis and in a more precise manner as they transfer large amounts of money to other banks in the course of the business day. Following the introduction of the Zahav system, the banks have had to provide specific collateral in addition to the

[42] Proper Conduct of Banking Business Regulation No. 342.

collateral provided against monetary loans. This has increased the banking system's liquidity requirements while the ratio of liquid assets held against liquidity risks is the same as in the past.

As a result of the subprime mortgage crisis in the US, large banks worldwide experienced a liquidity crisis in 2007 and had to raise capital.[43] Although the liquidity risk of the banks in Israel were not realized because the exposure of most of them to the subprime mortgage market was limited, the level of their liquidity risk rose slightly due to growing global uncertainty and concern over the impact of the financial crisis on the money and capital markets in Israel. As result of these developments, the Supervisor of Banks ordered the banks to re-examine their liquidity risk management policy, including the suitability of their policy and models to more stringent extreme scenarios and the required level of liquidity.

5. CAPITAL ADEQUACY

Capital adequacy expresses the amount of capital that enables a bank to absorb the unexpected losses likely to be caused as the result of the realization of the range of risks to which it is exposed. Capital adequacy is currently calculated in accordance with the recommendations of the Basel Committee and includes an allocation of capital against credit risks (as per the Basel Accord published July 1988) and the allocation of capital against market risks (the Amendment to the Capital Accord to Incorporate Market Risks, published January 1996). Accordingly, the minimum capital ratio required by the Supervisor of Banks is currently 9 percent.[44] From December 2009, the banks in Israel will be required to calculate the capital allocation in accordance with the Basel II recommendations as in the Revised Framework of June 2006. A Part from the capital requirement in respect of credit and market risks specified in the Basel I recommendations, under the Basel II recommendations an allocation of capital in respect of operational risks is required. The application of the Basel II recommendations is intended to enhance the quality of risk management and lead to more risk-focused capital requirements.[45]

Following the Supervisor of Banks' statement that he expects the banks' capital ratio to rise to at least 12 percent by the end of 2009, the banks in Israel confirmed that they would conform to this requirement. Accordingly, the risk-weighted capital ratio in the five major banking groups increased in 2007, albeit by a mere 0.13 percent point, to 10.95 percent, its highest level for the past decade. The increase in the capital ratio was

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43 See Section 6 below for further details of the subprime mortgage crisis.

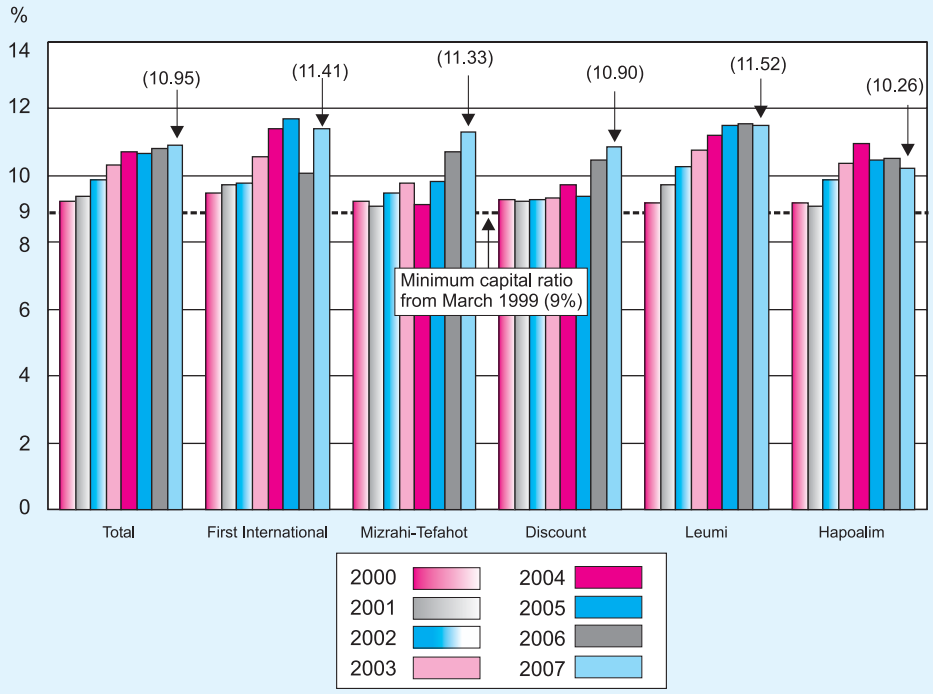
44 Although the minimum capital ratio required worldwide is 8 percent, in March 1999 the Supervisor of Banks raised the minimum capital ratio for the banks to 9 percent.

45 See Israel's Banking System, Annual Survey 2006, pp 103–109 and Chapter 4 of this survey.

not uniform and the variability between the banks was considerable (Table 3.7, Figure 3.12).[46]

Despite the improvement in the capital adequacy ratio in the Israeli banking system, Israel is still among the countries with the lowest surplus capital adequacy ratios (Figure 3.13). The Banking Supervision Department therefore expects the banks in Israel to continue raising their capital ratio in order to ensure that they are prepared for recession periods in which the risks facing them increase.

Figure 3.12
Risk-Weighted Capital Ratio of the Major Banking Groups, 2000-07



SOURCE: Published financial statements.

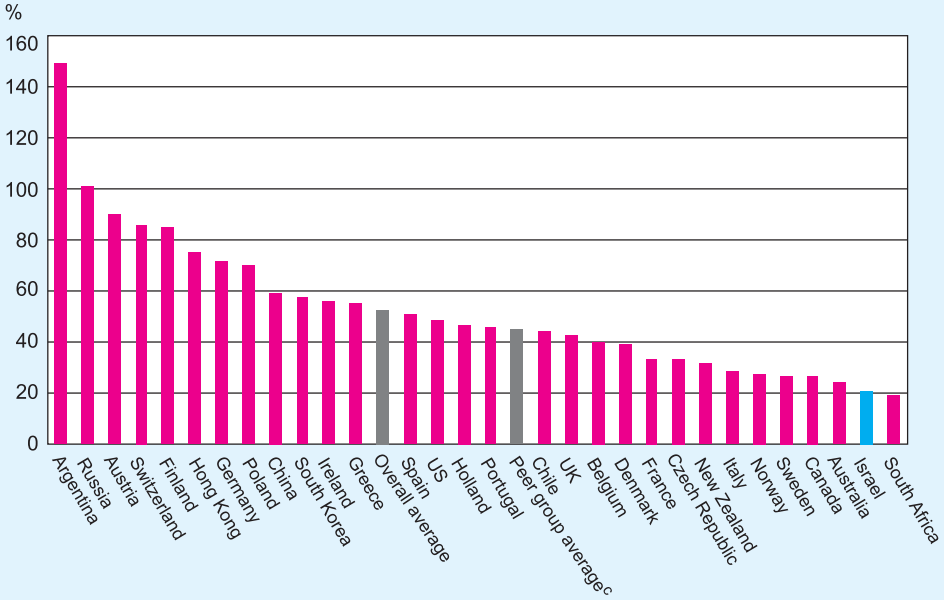
[46] The largest increase in the capital ratio, 1.31 percentage points, was recorded at the First International Bank. This was done in order to being the bank's capital ratio up to suitable level after it had fallen by 1.6 percentage points in 2006 following the acquisition of Bank Otsar Hahayal and additional shares in Israel Credit Cards. The rise in the ratio during 2007 resulted from the growth in the bank's shareholders' equity deriving from the annual profit and the issue of subordinated notes, which increased the bank's Tier 2 capital. Bank Hapoalim recorded a 0.27 percentage point decrease in the ratio to a level of 10.26 percent, the lowest ratio at the five large banking groups. The decrease resulted from a fall in profit compared with 2006 due to the bank's losses in the subprime mortgage crisis and to the retention of a dividend distribution policy, while risk-weighted assets increased at a higher rate. In addition, the Bank's Tier 2 capital decreased as the result of redemptions of its subordinated notes.

Table 3.7
The Distribution of Capital, and the Capital Ratios in the Five Major Banking Groups, 2006–07

	Hapoalim		Leumi		Discount		Mizrahi–Tefahot		First International		Total	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	(NIS million)											
Equity[a]	18,926	19,720	17,643	19,654	8,367	9,351	5,067	5,557	5,036	5,824	55,039	60,106
Tier 1 capital[b]	18,948	21,152	16,864	18,842	8,637	9,952	4,969	5,493	4,558	5,402	53,976	60,841
Tier 2 capital[b]	8,012	7,819	9,062	9,982	4,036	4,819	3,043	3,817	1,892	2,080	26,045	28,517
of which: Hybrid capital investment	752	772	511	522	3	3	451	961	0	0	1,717	2,258
Tier 3 capital	0	0	41	0	10	0	0	0	0	0	51	0
Investment in shares and subordinated notes of consolidated companies	-44	-45	-83	-87	-1,271	-1,466	0	0	-248	-318	-1,646	-1,916
Total capital for risk-weighted capital ratio calculation	26,916	28,926	25,884	28,737	11,412	13,305	8,012	9,310	6,202	7,164	78,426	87,442
	(NIS million)											
Total balance sheet	283,056	303,944	289,673	302,484	162,735	169,021	90,818	95,424	86,639	92,617	912,921	963,490
Balance of off-balance-sheet instruments (notional value)	451,898	536,702	215,146	320,494	113,590	164,747	120,527	165,444	96,789	102,084	997,950	1,289,471
Credit value of off-balance-sheet items	64,337	76,543	36,828	49,883	17,133	24,937	18,271	22,435	11,388	11,659	147,957	185,457
Weighted balance-sheet balances of credit risk	203,676	223,951	192,509	209,256	95,028	103,513	59,420	65,334	52,913	54,572	603,546	656,626
Weighted off-balance-sheet balances of credit risk	46,986	52,899	26,145	33,764	12,487	16,499	13,277	14,999	7,133	7,081	106,028	125,242
Market risk	4,967	5,067	5,184	6,531	1,649	2,126	1,791	1,866	1,355	1,152	14,946	16,742
Total weighted items	255,629	281,917	223,838	249,551	109,164	122,138	74,488	82,199	61,401	62,805	724,520	798,610
	(percent)											
Capital/balance-sheet ratio	6.69	6.49	6.09	6.50	5.14	5.53	5.58	5.82	5.81	6.29	6.03	6.24
Tier 1 risk-weighted capital ratio	7.41	7.50	7.53	7.55	7.91	8.15	6.67	6.68	7.42	8.60	7.45	7.62
Tier 2 risk-weighted capital ratio	3.13	2.77	4.05	4.00	3.70	3.95	4.09	4.64	3.08	3.31	3.59	3.57
Total risk-weighted capital ratio	10.53	10.26	11.56	11.52	10.45	10.89	10.75	11.33	10.10	11.41	10.82	10.95

[a] Equity and minority interest, according to groups' balance sheets.
[b] In accordance with the minimum capital ratio requirement.
SOURCE: Published financial statements.

Figure 3.13
Relative Excess Capital Adequacy Ratios[a] in Selected Banking Systems,[b] an International Comparison, 2007

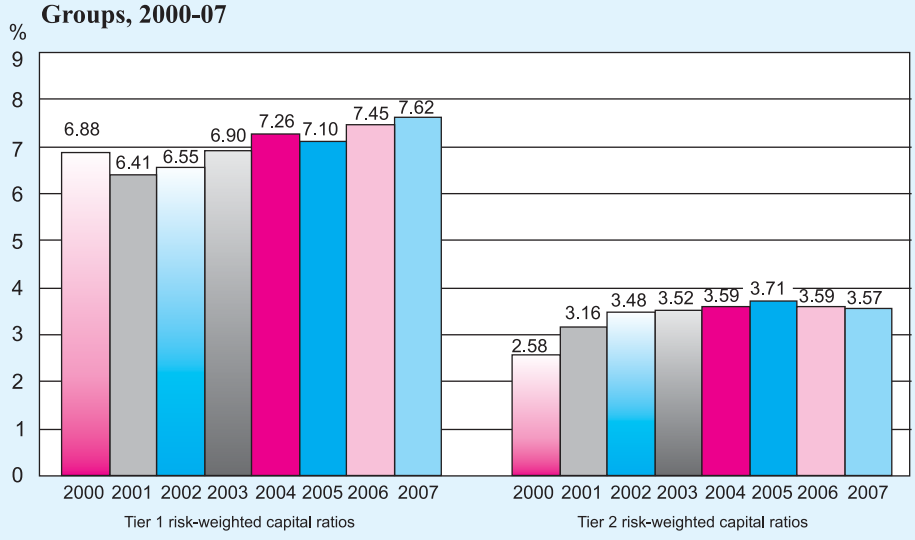


[a] The relative excess capital adequacy ratio is calculated as the percentage deviation of the actual capital ratio from the minimum required. The minimum capital adequacy ratio required in each country is 8 percent, except for Israel where the minimum required is 9 percent and South Africa where the minimum required is 10 percent.
[b] In general, values were based on the 10 largest banking groups, except for: the US, which was based on the 50 largest banking groups; Chile, Portugal, and South Korea, on the seven largest banking groups; South Africa, on the six largest; Israel, Belgium and the Czech Republic, on the five largest banking groups; and New Zealand, on the four largest banking groups.
[c] Israel's peer group consists of eight similar countries in terms of size of GDP and banking system: Belgium, Denmark, Finland, Greece, Ireland, Norway, Portugal and South Africa.
SOURCE: Based on Bankscope data.

For the second consecutive year, the rise in the capital ratio derived from an increase in the ratio of Tier 1 capital[47] (Figure 3.14), which is the largest and most stable part of total capital. (This is compared with the increase in the capital base, which resulted from an expansion of Tier 2 capital in previous years.) Tier 1 capital grew by NIS 6.9 billion or 13 percent. Tier 2 capital expanded by 9 percent and the ratio of Tier 2 capital amounted to 3.6 percent, similar to that in 2006. The ratio of subordinated notes to Tier 1 capital at the five major banks ranged from 50 percent at Bank Leumi and Bank Mizrahi—the maximum permitted ratio under the Banking Supervision Department's restriction—to 31 percent at Bank Hapoalim.

[47] The components of Tier 1 capital are: paid-up share capital (excluding accruing or redeemable preference shares), funds (deriving from the premium paid when issuing the other shares), surpluses (exclusive of losses), receipts on account of shares and minority interest in the equity of consolidated subsidiaries).

Figure 3.14
Tier 1 and Tier 2 Risk-Weighted Capital Ratios, the Five Major Banking Groups, 2000-07



SOURCE: Published financial statements.

6. THE IMPACT OF THE FINANCIAL CRISIS ON RISKS AND CAPITAL ADEQUACY

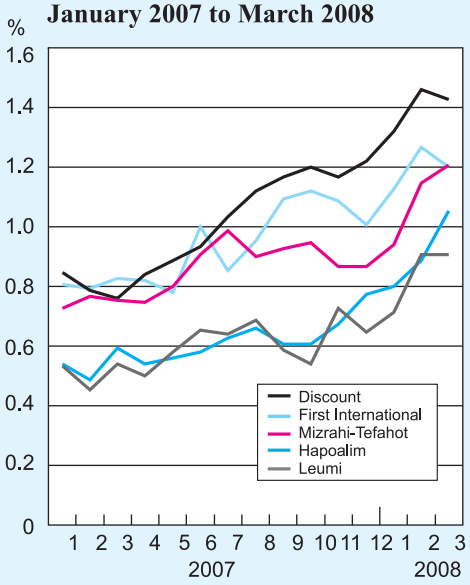
The turmoil in global financial markets that began in the second half of 2007 was not apparent in the accounting indices based on published financial reports. These showed a continued downturn in aggregate credit risk, which reached the lowest level for years.[48] Signs of the crisis were however reflected in capital market indices, where an increased level of risk was apparent. As a result of the crisis, the volatility and risk premium in the financial markets rose and the rise in asset prices typical of the markets in recent years ceased. These developments pushed up the level of credit risk in the banking system as evidenced by the rise in the risk premium of the banks' bonds (Figure 3.15).[49] The risk premium on corporate bonds—mainly those of unrated companies—rose as well.[50] The rise was particularly notable among real estate companies (Figure 3.16). This development is indicative of increased credit risk among the banks' customers. The increased level of risk resulting from the crisis is particularly apparent among real estate companies because of their considerable exposure to real estate investments abroad.

[48] See Section 1 in this Chapter for further details.

[49] This rise in the risk premium expresses a change in assessments of credit risk at the banks as perceived by investors and is a more accurate estimate of the credit risk in the banking system.

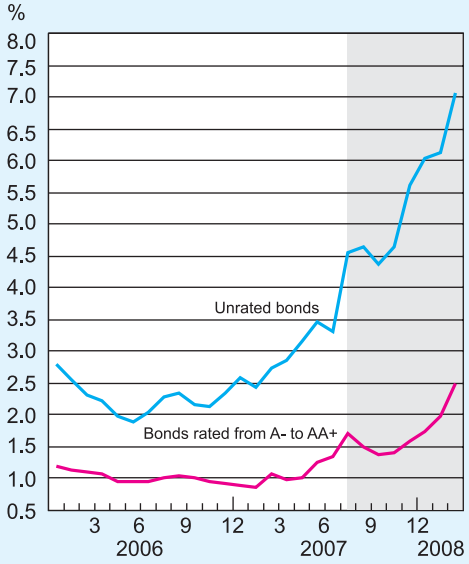
[50] The risk premium on corporate bonds is estimated from the difference between the average yield to maturity on corporate bonds and that on government bonds (which are regarded as risk-free) of similar duration.

Figure 3.15
Average Yield Gap between Bonds of the Five Major Banks and Galil Bonds of the Same Duration, January 2007 to March 2008



SOURCE: Bank of Israel.

Figure 3.16
Average Yield Gap between Corporate Bonds[a] and Galil Bonds of the Same Duration, January 2006 to March 2008*



[a] Based on data on 36 bonds rated from A- to AA+ And 50 unrated corporate bonds. Monthly averages.
* The gray area is the period of the financial crisis that started in the subprime mortgage market.
SOURCE: Bank of Israel.

The increased risk was reflected by a large drop in real estate share prices in the second half of the year and by the level of the risk premium in the real estate industry. The crisis were apparent from a change in investors' risk assessments and led to a considerable decrease in the supply of non-bank credit, especially for real estate companies, a large growth in the amount of the banks' balance-sheet credit granted to those companies, and an increase in the concentration of the banks' credit portfolio. The increased credit risk was also apparent in the finance industry, particularly in the first quarter of 2008 when stock indices plummeted worldwide and risk margins expanded. The losses posted in the indices led to a deterioration in the position of borrowers, for whom stocks account for a large part of their asset value as well as the collateral on which their lender banks rely. Credit risk also increased customers exposed to the exchange rate and commodity prices. If the crisis in the capital market continues, it could lead to a deterioration in the position of those of the banks' customers who raised capital at relatively low cost in the capital market during recent years, and which could encounter difficulties in rolling-over their debt in the future.

The rise in risk is also apparent from the decrease in the largest five banking groups' market value to book value (MV/BV) ratio, most notably in the first quarter of 2008, and

at Bank Hapoalim in particular. The decline in this ratio resulted from the adverse effect on the profitability of the banks that recorded permanent losses as a result of the crisis, and from the banking system's increased level of risk as apparent from the downturn in the prices of the banks' stocks and the rise in volatility.[51]

The impact of the financial crisis on capital adequacy was mainly apparent at Bank Hapoalim: In December 2007 the bank charged permanent losses of NIS 1.176 billion to the statement of income, at a result of which the growth in profit was less than that in risk-weighted assets. In addition, the five largest banks charged losses classified as temporary of NIS 961 million in the second half of 2007 as a decrease in the fair value of shareholders' equity (Box 3.1). These losses, although classified as temporary and not amortized in the statement of income, could become permanent losses in the future.

The financial crisis exposed the banking system to another risk, due to its reliance on the ratings issued by external credit rating companies. The standardized approach to calculating the capital requirement in respect of credit risks and market risks and reducing credit risk using the various approaches for calculating the capital requirement for credit risk in accordance with the Basel II recommendations are all heavily based on the ratings determined by external credit rating companies. The rapid reduction in ratings at the beginning of the crisis exposed deficiencies in the functioning of the international credit rating companies, and the credibility of their ratings was undermined. The banks' reliance on the ratings prescribed for their bond investments proved to be erroneous, because major losses were recorded even on bonds that had been given a high rating. These deficiencies led to a more critical approach to bond ratings. Accordingly, international organizations issued more stringent standards for the rating companies, and authorities worldwide are examining the possibility of prescribing additional terms with respect to the use of external rating companies, over and above the terms stipulated in Basel II.[52]

Box 1: The subprime crisis

The crisis in the subprime mortgage market in the USA was a major issue for the banking system as well as the capital market in Israel during the second half of 2007. The crisis concerned the securitization of financial assets, a device that has existed worldwide for many years. Most of the credit in the American mortgage market is financed by the process of securitizing mortgages and issuing them as securities to the general public, with the mortgage repayments serving to finance the public's return on their investment. The practice of asset securitization became more common in recent years and led to the creation of complex financial products. The supervisory authorities worldwide had difficulty

[51] See Chapter 2 for more details.

[52] Paragraph 91 of the Basel II recommendations.

in keeping up with the pace at which the products were being developed, and thereby also found it difficult to estimate and maintain full regulatory coverage over the risks inherent in these instruments. As a result of the burgeoning demand for investment in mortgage-backed assets, financial institutions began to offer more flexible terms for the receipt of mortgages, leading to the development of a secondary mortgage market where the quality of the borrowers was inferior to the quality that had served as the norm in the past. This was how the subprime mortgage market was created. Since subprime mortgages were usually granted at floating-rate interest, the risk of potential interest rate volatility and mismatch between such changes and the mortgage recipients' income increased. In order to market issues as high-quality securitized assets, the financial institutions pooled these assets into large mortgage pools. By expanding the diversification of the mortgages and other collateral provided for issues, they reduced the aggregate risk level of the mortgage-backed bonds. This made it possible to increase the rating of the bonds while the quality of the source assets (mortgages) remained unchanged. Investors regarded investment in bonds of this type as a stable investment, albeit with a relatively high yield – despite the fact that a high yield is usually indicative of risk. As the result of a large rise in the interest rate in the USA, borrowers had difficulty in maintaining their mortgage repayments, thereby delaying the cash flows deriving from the bonds. The legal entities (SPVs – Special Purpose Vehicles[1]) that had issued the bonds experienced serious liquidity problems and the financial institutions behind them had to inject cash in order to prevent their bankruptcy. Due to the sharp rise in the interest rate and borrowers' inability to repay their loans, the real estate industry in the USA entered a serious recession. This recession exacerbated the crisis because the value of assets underlying the securitization and serving as collateral for the bonds declined. As a result, the value of the bonds plummeted. This process led to the bankruptcy of the issuing entities, plunging the market into a spiral whose outcome has yet to be become apparent.

The impact of the subprime crisis on Israel's banking system

In view of global developments and Israeli banks' growing activity in asset-backed financial instruments, the Supervisor of Banks required the matter to be subjected to due disclosure in the banks' financial statements with effect from September 30 2007. The reports of the five large business groups for that date show that their exposure to the subprime market is immaterial. Their exposure to asset-backed instruments amounted to NIS 40 billion. The largest exposure, NIS 17.7 billion (Table1) was at the Bank Hapoalim group.

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1 These are stand-alone legal entities that serve as a divide between entrepreneurs and investors. Under the law, an SPV is exempt from tax and is bankruptcy remote.

Table 1
The Israeli banking system's exposure to complex financial instruments, five largest banks, December 2007 (NIS million)

	First International	Mizrahi-Tefahot	Discount	Hapoalim	Leumi	Total
(1) MBS	1,144	0	8,663	14,369	4,496	28,672
(2) CDO/ABS	224	137	6	772	1,656	2,795
(3) Other[a]	0	22	0	2,601	508	3,131
Total asset-backed bonds (1+2)	1,368	137	8,669	15,141	6,152	31,467
Total exposure[b] (1+2+3)	1,368	159	8,669	17,742	6,660	34,598
Decrease in fair value (charged to shareholders' equity)[a]	8	23	77	674	179	961
Decrease in fair value (charged to income statement)[a]	0	114	0	1,176	28	1,318
Total exposure/Total assets (percent)	1.50	0.20	5.10	5.80	2.20	3.60
Total Exposure/ Shareholders' equity (percent)	24.90	2.90	94.20	94.50	34.00	56.90
Loss in income statement/ Net profit (percent)	0.00	12.50	0.00	43.90	0.80	14.70

[a] Asset-backed securities ABS) (not necessarily related to the mortgage market in the USA) + other financial instruments
exposed to the mortgage market in the USA
[b] Including SIV investment.
SOURCE: Published financial statements for 2007.

A bank's nostro portfolio is divided into three parts: (1) Bonds held to maturity – bonds which the banking corporation intends and is able to hold till the maturity date; (2) Securities for trading – securities that were purchased and that in principle are held in order to sell them in the near future (and which are therefore held for short periods). Activity for trading usually takes the form of vibrant buy-sell activity for the purpose of producing earnings from trading – from bid-ask spreads, differences between wholesale and retail prices and from short-term price changes. Changes in value are charged to the statement of profit and loss; (3) Securities available for sale – securities that have not been classified as bonds held to maturity or as securities for trading.

Most of the banks' exposure to asset-backed backed bonds is in the portfolio available for sale. When the value of a security falls, the recording of the change is dependent on the bank's assessment of its nature: When the decrease is assessed as temporary, it is recorded under the bank's capital fund. The capital fund is not

included in the calculation of capital for the purpose of adhering to the minimum capital ratio. When the bank assesses a writedown as of a non-temporary nature, it reports the change in value as a loss in the statement of income. It is usual practice to define the writedown (decrease in the value) of a security as of a non-temporary nature on the basis of the following parameters: (1) The ratio of the decrease in value to the cost of the security; (2) A change in international rating agencies' grading of the security; (3) The length of time for which the value of the security is less than its cost; (4) The value of the collateral backing the security. As previously mentioned, Bank Hapoalim recorded the highest rate of loss among the five banking groups even though it was not exposed to subprime market securities. The other banking groups recorded writedowns that are also mainly assessed as temporary writedowns. Overall and unlike other Western countries, the subprime crisis had little effect on the Israeli capital market. This is due to the difference between the mortgage market in Israel, where bonds are not issued in order to raise capital, and the markets in the USA and Europe. In addition since the securitization is still in its infancy in Israel, the overall impact of the subprime crisis on the Israeli economy was minimal. The few effects of the subprime crisis that did become apparent were in two areas: (1) Direct losses for those investing in securities exposed to the subprime market; (2) The losses posted on the Tel Aviv Stock Exchange due to the concurrent price slides in the world's major stock markets. As a result of the Parterial relationship between the Israeli capital market and global capital markets, the downturn in prices in Israel proved to be more moderate than that abroad. The subprime crisis had a greater impact on the banking industry in Israel (Table 2).

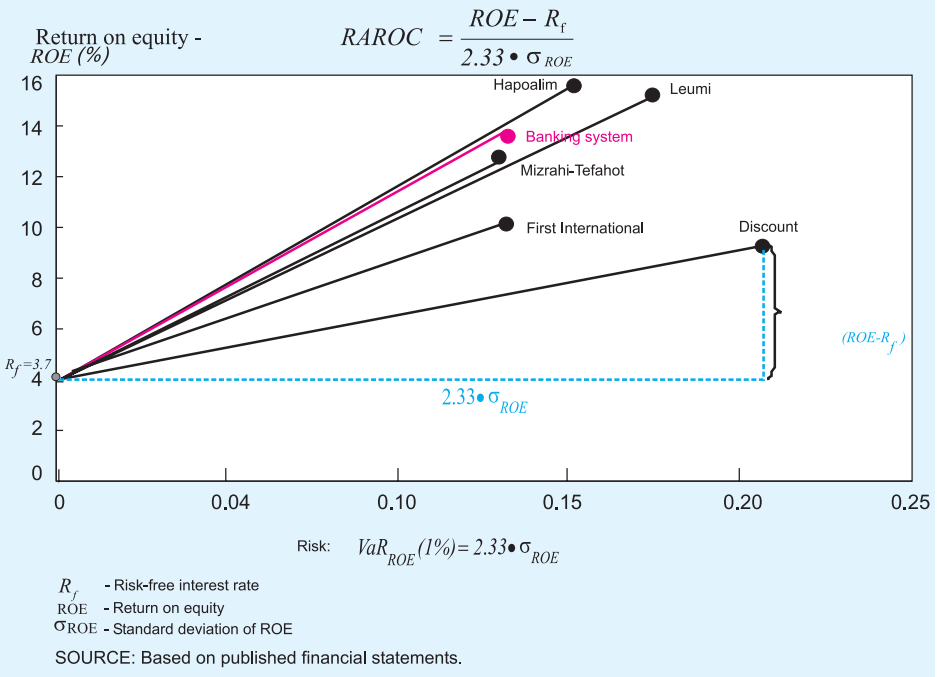
Table 2
The correlations between the indices in Israel and the S&P 500 Index in the USA

Sample period	Banks Index – S&P 500	Tel Aviv 100 – S&P 500
August 2007 – December 2007	0.25	0.246
January 2007 – July 2007	0.609	0.476

7. RISK-ADJUSTED RETURN ON CAPITAL

A downturn was recorded in the risk-adjusted return on capital (RAROC) index in 2007 compared with 2006. This came after an improvement since 2003 following the low levels of 2001 and 2002. The deterioration was apparent at the Hapoalim and the Leumi group, while an improvement in the index was recorded at the Discount, Mizrahi-Tefahot and First International groups. The poorer performance of the index in 2007 compared with 2006 resulted from the profits from extraordinary transactions that were recorded in 2006 as a result of the implementation of the Bachar reform. From the aspect of RAROC on the basis of ordinary profit, an improvement in the index was actually apparent in 2007. The improvement encompassed all of the banking groups except for the Hapoalim group, where the index fell because of the write-offs in respect of investment in asset-backed bonds. Differences in performance, sometimes considerable differences, were apparent between the groups (Figure 3.17).

Figure 3.17
Risk-Adjusted Return on Capital, Comparison of Five Major Banking Groups and Banking System, Average 2003-07



R_f - Risk-free interest rate
ROE - Return on equity
σROE - Standard deviation of ROE

SOURCE: Based on published financial statements.

A breakdown by activity segment and by banks shows that the commercial banking segment at all the banking groups again presented the highest RAROC in 2007. Concurrently, the overseas offices of all the banking groups presented a negative RAROC value (Table 3.8).

Table 3.8
Risk Adjusted Return on Capital (RAROC), the Variance-Covariance Approach,[a] by Banking Group—Chapter A, by Type of Company,[b] 2007; Chapter B, Total Activity, 2005–07

		Hapoalim	Leumi	Discount	Mizrahi –Tefahot	First International[c]	Total
A*	Commercial banking	0.91	1.25	0.68	1.01	0.46	1.13
		(30.23%)	(29.38%)	(48.01%)	(74.08%)	(77.55%)	(40.94%)
	Mortgage banks	0.00	0.90	0.06	0.26	0.00	0.70
		(0.00%)	(10.70%)	(6.91%)	(7.11%)	(0.00%)	(5.20%)
	Overseas offices	-0.13	-0.14	-0.29	-0.14	-0.09	-0.21
		(16.94%)	(23.90%)	(32.14%)	(4.82%)	(14.14%)	(20.08%)
	Financial companies[d]	0.10	0.23	-0.10	-0.11	1.55	0.93
		(31.47%)	(29.77%)	(3.93%)	(8.46%)	(3.46%)	(22.15%)
	Credit card companies	0.81	0.08	0.46	0.00	0.07	0.54
		(5.18%)	(2.03%)	(6.25%)	(0.00%)	(4.24%)	(3.74%)
	Real companies and insurance companies	0.29	0.00	0.00	0.00	0.00	0.51
		(2.19%)	(0.00%)	(0.00%)	(0.00%)	(0.00%)	(0.75%)
	Other subsidiaries	0.03	-0.13	0.07	0.05	0.20	-0.12
		(14.00%)	(4.23%)	(2.76%)	(5.53%)	(0.61%)	(7.14%)
B	Total activity of the banking group						
	2005	1.01	0.84	0.22	0.84	0.65	0.96
	2006	0.89	1.00	0.36	0.75	0.56	1.00
	2007	0.60	0.83	0.48	0.90	0.73	0.83

[a] *RAROC* is calculated by the variance-covariance approach: $RAROC_i=(ROE_i-R_f)/(2.33*\sigma_{ROE_i})$

where

ROE = return on equity in the last year (profit at end of year to investment at beginning of the year).

R_f = risk-free interest: yield to maturity on 5-year CPI-indexed government bonds (Galil).

σ_{ROE} = standard deviation of *ROE*, calculated from quarterly observations *ROE*s over seven years (section B of table). Standard deviation of *ROE* of individual areas of activity is calculated from annual observations of *ROEs* over ten years (section A of table).

2.33 = the value of Z at the 99% significance level.

[b] If there was no banking activity in a Partericular segment in 2007, RAROC is recorded as 0.

[c] The merger of the First International Bank, First International Mortgage Bank and Atzmauth Mortgage and Development Bank caused some distortion in the group's *RAROC* data when their activities were divided into the above categories. This was due to the fact that capital was calculated as of the end of 2005 (the year before the merger) and profit was calculated as of the end of 2006 (after the merger).

[d] Including holding and investment companies, leasing companies, and financial holding companies.

[*] Figures in parentheses are the average ratios (percent) of investment in the activity to the equity of the banking group in 2007.

SOURCE: Published financial statements.

8. THE ROBUSTNESS OF THE BANKING SYSTEM ACCORDING TO THE ROBUSTNESS INDEX[53]

The Robustness Index fell in 2007 – a development indicative of an improvement in the Israeli banking system's robustness and resilience – continuing the improvement that began in 2003 when the economy exited the recession of 2001-2002. The index is based on six principal categories: capital adequacy, asset quality, management quality, profits and profitability, exposure to liquidity risk and exposure to markets risks. Sub-categories within each of the principal categories of the Robustness Index are examined as well, and these are comprised of various financial ratios. The improvement in the index score in 2007 was centered in three categories: asset quality, profits and profitability, and management quality.[54] The highest score in asset quality since the year 2000 (the year when the index was first applied) was achieved in 2007 due to a considerable improvement in credit quality.[55] The improvement in the profits and profitability category, and the score of the three medium-sized groups in partericular, derived from an improvement in ROE.[56]

The increase in the level of risk observed at the end of the year on the basis of capital market indicators and as a result of the financial crisis caused by the subprime crisis was not reflected in the Robustness Index. This is because the index is based mainly on accounting data taken from published financial statements,[57] rather than on data from the capital market.

Table 3.9
The Robustness ("Hosen") Index of Banking Institutions in Israel; Weighted Average for the Entire System, 2000-07

2000	2001	2002	2003	2004	2005	2006	2007
2.78	2.97	2.93	2.77	2.60	2.59	2.47	2.42

53 This index was developed and applied by the Banking Supervision Department. The index varies between 1 (the highest grade, indicative of financial resilience from every aspect) and 5 (the lowest grade, indicative of extreme financial instability). For a detailed explanation of the index and its components, see Box 1.1 in the Annual Survey for 2003 as well as Y. Fishman and D. Ruthenberg, "*Hosen* – an Index for Examining the Resilience and Robustness of the Banks in Israel, Banking Issues 17.

54 On the basis of subjective assessments by Banking Supervision Department professionals.

55 See section 1 in this chapter for further details.

56 See Chapter 2 for further details.

57 See section 6 in this Chapter for further details.

Table A.3.1

Distribution of Credit to the Public[a] by Single Borrower Indebtedness, the Five Major Banking Groups,[b] 2006-07

	Outstanding credit to public, and off-balance-sheet credit risk		Number of borrowers		Average outstanding credit		Cumulative proportion of outstanding credit		Cumulative proportion of borrowers	
Credit per borrower	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
(NIS thousand)	(NIS million)				(NIS thousand)		(%)		(%)	
Up to 10	10,010	11,904	1,924,963	2,146,823	5	6	100.0	100.0	100.00	100.00
10 to 20	9,404	8,838	599,648	595,405	16	15	98.9	98.9	61.59	59.77
20 to 40	20,939	21,105	690,244	716,317	30	29	98.0	98.0	49.62	48.62
40 to 80	41,835	42,939	720,528	731,251	58	59	95.8	96.0	35.85	35.19
80 to 150	54,242	58,505	507,281	540,542	107	108	91.4	91.9	21.47	21.49
150 to 300	65,475	67,695	311,646	320,810	210	211	85.7	86.4	11.35	11.36
300 to 600	68,472	74,925	165,741	179,707	413	417	78.8	79.9	5.13	5.35
600 to 1,200	40,302	48,888	49,836	59,913	809	816	71.6	72.8	1.83	1.98
1,200 to 2,000	20,570	24,422	13,761	16,095	1,495	1,517	67.4	68.1	0.83	0.86
4,000 to 8,000	28,613	31,710	10,439	11,363	2,741	2,791	65.2	65.8	0.56	0.56
8,000 to 20,000	35,530	38,092	6,383	6,763	5,566	5,632	62.2	62.8	0.35	0.35
8,000 to 20,000	64,695	70,395	5,287	5,584	12,237	12,607	58.5	59.2	0.22	0.22
20,000 to 40,000	70,845	76,819	2,638	2,759	26,856	27,843	51.7	52.5	0.12	0.12
40,000 to 200,000	222,294	232,214	2,750	2,889	80,834	80,379	44.3	45.2	0.06	0.06
200,000 to 400,000	83,028	94,321	311	336	266,971	280,717	20.9	23.1	0.01	0.01
400,000 to 800,000	60,130	73,737	112	133	536,875	554,414	12.2	14.1	0.00	0.00
800,000 to 1,200,000	29,699	25,088	31	27	958,032	929,185	5.9	7.1	0.00	0.00
1,200,000 to 1,600,000	8,195	21,489	6	16	1,365,833	1,343,063	2.8	4.7	0.00	0.00
1,600,000 to 2,000,000	8,706	12,801	5	7	1,741,200	1,828,714	1.9	2.7	0.00	0.00
2,000,000 to 2,400,000	4,309	6,570	2	3	2,154,500	2,190,000	1.0	1.5	0.00	0.00
2,400,000 to 2,800,000	5,120	5,403	2	2	0	2,701,500	0.5	0.8	0.00	0.00
2,800,000 to 3,200,000	0	0	0	0	0	0	0.0	0.3	0.00	0.00
Higher than 3,200,000	0	3,295	0	1	0	0	0.0	0.3	0.00	0.00
Total	**952,413**	**1,051,155**	**5,011,614**	**5,336,746**	**190**	**197**	**100.0**	**100.0**	**100.00**	**100.00**

[a] Includes the balance of credit to the public and credit-risk equivalent of off-balance-sheet financial instruments, calculated according to the definitions used for calculating the single borrower limitation. Excludes the public's investment in bonds.

[b] The data in the "up to 8,000 shekels" category are the summation of the figures for each consolidated company (consolidation on the basis of layers) in the credit categories, while for over 8,000 shekels, the credit data and the number of borrowers were

SOURCE: Published financial statements.