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THE CHARACTERISTICS OF FIRMS WITH BANK CREDIT THAT RECENTLY ISSUED BONDS ON THE TEL AVIV STOCK EXCHANGE[1]

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Abstract

In this paper, we examine the characteristics of firms with bank credit that issued bonds on the Tel Aviv Stock Market (TASE) during the period 2003–07. The purpose of the research is to determine how the expansion of the nonbank credit market has affected the risk of bank credit. The analysis was carried out using a number of statistical approaches, in particular the Logit model which differentiates between firms that have issued bonds on the TASE and those that have not. We reached the conclusion that it is primarily large, profitable and low-risk firms, i.e., higher-quality firms, that have issued bonds on the TASE. Although various accounting and macroeconomic indicators (such as the ratio of bank credit to GDP, the ratio of annual loan loss provisions to total bank credit, etc.) show that the risk of the credit portfolio has declined, the phenomenon that we describe has, in our opinion, two parallel and opposite effects on the banks' credit portfolio. The first is the negative effect on its quality and the second is the positive effect on its level of diversification. We would mention that small, high-risk firms that have bank credit took advantage of the boom in the capital market and the high rates of economic growth during the period 2003-7 in order to issue bonds on the TASE which replaced (or supplemented) bank credit. However, due to their small share of total bond issues, their effect on the overall risk of the banks' credit portfolio was minimal.

1. INTRODUCTION

In recent years, there has been a noticeable decline in the share of bank credit within total funds (i.e., bank credit and its nonbank substitutes) raised by the business sector (Figure 1).

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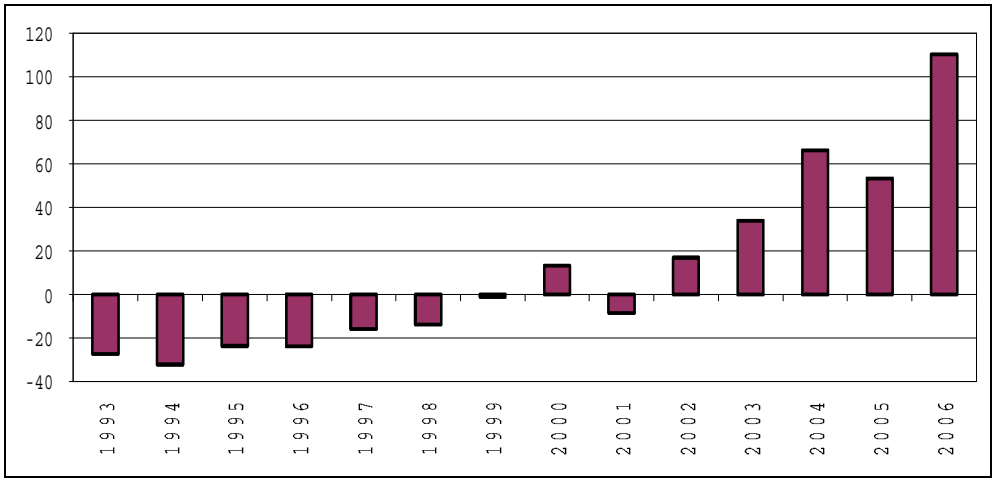
Figure 1
Difference between the funds raised from nonbank sources and the changes in commercial bank credit1
Annual data, 1993–2006
NIS (billion)



[1] Balance sheet credit which does not include credit to private individuals and to borrowers for activity abroad.
SOURCE: Based on reports to the Bank Supervision Department; Annual Report of the Commissioner of the Capital Markets, Insurance and Savings in the Ministry of Finance; Bank of Israel data; TASE.

This decline led to the diversification of the business sector's sources of financing and increased the competitive threat to the banking system. The increased amount of funds raised through substitutes for bank credit was concentrated primarily in the corporate bond market. The main factors behind the expansion of this market are as follows:

1. The decrease in the government deficit, which led to the contraction of government bond issues in the local market and a shift of funds by institutions to bond issues of the business sector.
2. The government reform in the capital market which was based on the reduction in implicit guarantees provided by the government to the pension funds through the issue of designated bonds. As part of the reform, investment regulations were relaxed in order to allow pension funds to diversify their portfolios. The reform was implemented (starting in September 2003) with the discontinuation of the issue of designated bonds to the veteran pension funds.
3. The high rate of economic growth, the high level of firm profitability and the boom on the TASE.

An additional factor that contributed to the expansion of the market for credit substitutes was the policy of the banks in recent years. Following several years (primarily in the late 1990s) during which bank credit expanded (sometimes at double-digit rates), despite the lack of growth in the economy and the fact that guarantees provided to the banks proved to

be of poor quality (and sometimes even non-existent), the banks decided in recent years to adopt a policy of credit rationing. This policy, in addition to the effectiveness of the single borrower constraint, led to a situation in which many firms turned to the capital market in order to finance their activity.[2] (For more details on credit rationing and its implications, see Geva and Goldshmidt, 1984.)

The data on TASE bond issues in recent years indicates that the proportion of firms which issued rated bonds in 2006 was relatively high (about 88 percent of the total volume of bond issues and about 60 percent of the number of bond issues).[3] These data are consistent with the findings of various empirical studies carried out in other countries. Thus, Cantillo and Wright (2000), Shirasu and Xu (2007) and Denis and Mihov (2003) showed that large firms, which have a higher level of profitability and lower levels of risk, use nonbank sources of financing as an alternative to bank credit, which leads to savings in their costs of raising funds. The findings of the present study are important because of the implications of this phenomenon on the risk of the banks' credit portfolio.

The goal of this research is to examine the effect of the expanded nonbank credit market on the risk of bank credit with respect to both the quality of the credit portfolio and its level of diversification. This will be done through an analysis of the characteristics of firms with bank credit that issued bonds on the TASE. The findings have allowed us to draw conclusions as to the quality of bank credit and its level of diversification.

The analysis of the data was carried out using two methods: The **first method** differentiates between firms that issued bonds during the period 2003–6.2007 and those that did not. In other words, we related to the group of firms that issued bonds as a homogenous group without differentiating between high- and low-risk firms. The **second method** differentiates between three groups, where the group of bond-issuing firms is divided into two sub-groups: firms that issued high-quality bonds and firms that issued high-risk bonds. An additional distinction was made with respect to the date of the firm's initial issue of bonds on the TASE. In this context, 2006 was chosen as the dividing point between the two sub-periods. An analysis of the data was carried out for each of the approaches using two statistical methods: univariate analysis and the Logit model. It is worth mentioning that the Logit model makes it possible to predict the probability that a firm with bank credit will issue bonds. This prediction is based on the firm's risk parameters, which include the credit rating given by the lending bank, a variable that is unique to this research, and other financial ratios that reflect, among other things, the size of the firm, its level of profitability and its liquidity.

In addition, we would point out that the analysis of the data in the second method was similar to that in the first, i.e., univariate analysis and the Logit model, although due to the

[2] An analysis of the data shows that for a number of large firms the single borrower constraint was effective. Therefore, their entry into the TASE significantly reduced the relevance of that constraint for them.

[3] Notwithstanding the high percentages reported above, we would mention that in recent years there has been somewhat of a decline in the proportion of firms that have issued rated bonds. Source: The Bi-Annual Economic-Financial Conference of the Association of Public Companies and DC Finance, The Credit Revolution in the Capital Market, Financing of the Business Sector by the Stock Exchange–Data and Trends.

existence of three groups of firms a multinomial Logit model was used where the group of firms with bank credit that did not raise funds by issuing bonds on the TASE were chosen as the basis for comparison.

The article is organized as follows: Section 2 presents a survey of the literature. Section 3 describes the data, the sample and the variables used for the empirical analysis. Section 4 presents the results of the analysis and Section 5 provides a summary and conclusions.

2. SURVEY OF THE LITERATURE

The main research question we attempt to answer is why some firms raise funds from nonbank sources while others rely on bank credit. The answer depends on the characteristics of those firms that prefer nonbank sources over bank credit.

A number of articles, which have laid the theoretical foundations for the analysis of firms that obtain funds from nonbank sources and their characteristics, focus on the following factors:

1. **Monitoring and its effect on the problem of moral hazard:** Diamond (1991) presented a model in which firms borrow from the banks and are prepared to pay for the banks' monitoring up until the point at which they have built up a reputation through a sufficiently long history that is free of insolvency events. Once its reputation has been established, the firm is able to issue bonds at a lower rate of interest. Therefore, there is an incentive to build up a reputation through bank credit.[4] Once firms have matured and established a reputation, they are able to issue bonds since their reputation constitutes a sufficient incentive for them to avoid risky projects. Since firms with a low credit rating have no reputation to lose if they reach a situation of insolvency, the existence of bank monitoring, which prevents moral hazard problems, does not constitute an incentive for them, and as a result they issue bonds. Therefore, firms that obtain funds through bank credit are those with an intermediate credit rating. The rating of these firms is too low to constitute an incentive to avoid problems of moral hazard but high enough for the firms to benefit from bank monitoring that will prevent problems of moral hazard. Rajan (1992) claimed that alongside the advantages of bank monitoring, there are disadvantages in the bank-firm relationship that reduce the firm's incentives. The bank, which is aware of the project's situation, can prevent the renewal of the project's financing in the case of a negative net present value (NPV) or will use its negotiating power when renewing the loan. In the case of long-term bank credit, the bank can demand payment only when the project is complete and therefore cannot appropriate the firm's profits. However, in this situation, in which the bank cannot stop financing when the project is not profitable, managers have less incentive to avoid unprofitable projects. The result is that bank monitoring is more worthwhile for firms with low-quality projects that are financed through long-term credit.

2. **Cost of bank monitoring and of information**: Fama (1985) claimed that the cost of issuing bonds (cost of the covenant and of information) is high relative to that of bank

[4] This claim is supported by various empirical studies which indicate that the market positively views bank credit (see, for example, Datta et al., 1999).

credit, in particular for small firms due to the fixed costs involved. Therefore, small firms prefer a bank loan that involves lower information costs since it requires the transfer of information to fewer investors than public debt, even though the interest rate demanded by the banks may be higher. For large firms, on the other hand, the cost of issuing bonds is lower as a result of economies of scale.

3. **Liquidity, restructuring and renegotiation**: Chemmanur and Fulghieri (1994) developed a model based on the advantage of using bank credit that arises from the possibility of restructuring the loan if the borrower encounters financial difficulties. As a result, firms with a higher probability of encountering financial difficulties will prefer a bank loan since it is easier to renegotiate. In contrast, firms with a low probability of encountering financial difficulties do not need the option of restructuring and therefore will choose to issue bonds. Berlin and Loeys (1988) developed a model in which the firm chooses between two alternatives: The first involves monitoring (for example, a bank loan) which ensures a more efficient liquidity policy but also is more expensive. The second does not involve monitoring but rather a rigid covenant (such as in the case of issuing bonds). The firm's optimal choice depends on its characteristics and reflects the substitution between the rigid covenant of a bond and the efficient, though usually more expensive, monitoring of a bank. The firm's choice is shown to depend upon the firm's credit rating, the accuracy of financial indicators of its condition, the loss from premature liquidation of the project, and the cost of monitoring.

The recent empirical literature[5] has concluded that high-quality firms, i.e., large, profitable and low-risk firms, tend to issue bonds while high-risk firms, i.e., smaller and unrated firms with large fluctuations in profitability, depend mainly on bank credit.

Denis and Mihov (2003) used a sample of 1,560 issues of debt by US firms that involved three different sources of funds: the public, the banks and other private sources. They estimated logistic regressions that predict the firm's source of financing during the period 1995–6. In a regression where the independent variable is the log of the ratio of the probabilities of a public issue as opposed to bank credit, it was found that the following variables had a positive effect on the probability of a public bond issue: the size of the firm (as measured by total assets), the ratio of fixed assets to total assets (which reflects the quality of collateral), the investment grade, and the firm's profitability and leverage (as reflected by the ratio of debt to assets). It is worth emphasizing that the leverage variable was interpreted as the firm's reputation and not as risk, which is the general interpretation.

Hadlock and James (2002) examined the data on public firms during the period 1980–93 using logistic regressions that predict the probability of a firm obtaining financing funds through public debt. On the basis of various financial variables, they found that this probability is positively related to the size of the firm (log of assets) and its leverage (measured by the ratio of debt to assets) and negatively related to the fluctuations in its share price (as an expression of risk).

Cantillo and Wright (2000) estimated a regression using panel data on US firms for the period 1972–92, where the dependent variable was the share of bonds in total long-term debt. It was found that parameters such as size (log of sales), cash flow (operating revenue

[5] Most of the empirical studies have been based on data for firms in the US.

relative to sales) and the ratio of fixed assets to total assets had a positive effect while the real rate of interest (the return on one-year bonds less expected inflation) had a negative effect. Johnson (1997) used a Tobit regression that measured the following three dependent variables on a scale of 0 to 1: the share of long-term bank credit within the firm's total long-term debt, the share of private long-term nonbank debt and the share of public long-term debt within total long-term debt. The results indicated that the proportion of public debt (bond issues) is positively affected by the size of the firm (total assets), the age of the firm, the proportion of fixed assets within total assets and leverage and is negatively affected by volatility in the growth of revenue.

Sharasu and Xu (2007) examined the debt structure of public firms in Japan during the period 1993–97 using a Tobit regression which, as mentioned above, measures the dependent variable on a scale of 0 to 1. They performed a number of regressions for several dependent variables which reflect various debt structures, including the ratio of bonds to total bonds and bank loans. They focus on the effect of the firm's quality (as measured by the MV/BV ratio) and the ratio of fixed assets to total liabilities (which reflects the quality of collateral) on the structure of debt and add the firm's size, leverage and interest coverage ratio as control variables. The results indicated that high-quality firms tend to issue binds while highly-leveraged (i.e., high-risk) firms or firms with a low interest coverage ratio depend primarily on bank credit.

Some of the models (such as Diamond, 1991) show that the choice between bank credit and issuing bonds is not linear and that issuers of bonds are found at both ends of the risk scale, which ranges from safe firms at one extreme to risky firms at the other. Johnson (1997) took this into account in his empirical analysis by differentiating between solid firms with a rating of BBB or higher and risky firms with a lower rating or no rating at all. He found that for solid firms size has a negative and statistically significant effect on the proportion of bank credit within total debt. For risky firms, size was not found to be significant while the effect of age and the MV/BV ratio was negative and significant and the effect of leverage and the proportion of fixed assets within total assets was positive and significant.

3. THE SAMPLE AND DATA SOURCES

Data sources

The database includes data on firms that appear in the Credit Exposure Report (Large Borrower Report) and which were listed for trade on the TASE during the period 2003–6.2007. The following data were gathered on these firms: the size of bond issues, the firm's credit rating as determined by the lending bank, various financial ratios for the firm (described below) and the yield-to-maturity of bonds issued by the firm. The information was obtained from the following sources:

1. **Credit Exposure Report:** A database maintained by the Bank Supervision Department, which contains information reported by the banks on borrowers whose credit exposure is

higher than NIS 20 million. The report is quarterly and includes information on the firm's credit rating, as determined by the lending bank.

2. **Financial statements:** A database maintained by the TASE based on the Ducas system, which includes information from the financial reports of companies listed for trade on the TASE. The financial variables serve as a basis for the calculation of aggregate financial ratios and include, among others, the total balance sheet, shareholders' equity, the firm's debt, etc.

3. **Data on bonds:** The TASE provides daily data for all its listed securities. The data includes year of the issue, size of the issue and the price of the bond. These data enabled us to calculate the bonds' yield-to-maturity.

The sample

The sample includes 165 firms (which do not include financial firms, such as banks, insurance companies, etc.) who are included in the Credit Exposure Report and are also listed for trade on the TASE.[6] The sample period is 2003–6.2007.[7] The median of the relevant financial ratios (to be described below) during the sample period is calculated on the basis of a quarterly database.[8]

An analysis of the data shows that 88 of these firms issued bonds on the TASE during the sample period.[9] The sample's breakdown by industry is as follows: 36 percent in real estate, 16 percent in services, 20 percent are holding companies, about 17 percent in manufacturing and the rest are primarily in computing and electronics.

The independent variables

1. **Size of the firm:** Measured by the log of the firm's total assets. Since a logarithmic function is convex (i.e., has a negative second derivative), the firm's rate of growth declines as its assets grow.

[6] It is worth mentioning that firms which issued bonds and are not included in the Credit Exposure Report are not included in the sample. The volume of credit risk (both balance sheet and non-balance sheet) of borrowers included in the Credit Exposure Report constitutes about 45 percent of the banks' total credit risk not including credit provided to private individuals. The value of bond issues included in the sample accounts for about 60 percent of the total value of bonds issued on the TASE and about 30 percent of the number of issues.

[7] This period can be characterized as one of accelerated economic growth and a boom in the capital market. The focus on a growth period is due to the fact that most of the issues were carried out in recent years as a result of the factors described in the introduction. Therefore, we do not carry out the analysis over a full business cycle and thus do not include time series data or macroeconomic factors.

[8] The reason that the median was chosen rather than the average is the existence of outlying observations during the selected sample period.

[9] Of which 72 issued tradable bonds and 16 issued private bonds.

2. **Risk variables:**

- **Credit rating:** A variable unique to this study which is taken from the banks' Credit Exposure Report. The variable's range is from 0-100: a low reported value indicates that the firm's credit is rated as high-quality and vice versa.[10]
- **Stability of profits:** Measured by the (quarterly) standard deviation of the return on assets (ROA) over a period of three years. This ratio expresses the volatility of profits and therefore a higher ratio indicates a more risky firm and vice versa.
- **Leverage ratio:** Measured by the ratio between the firm's total liabilities and total assets. A higher ratio indicates that the firm is more highly leveraged and therefore is perceived as more risky.[11]
- **Specific loan loss provision:** Measured by a dummy variable that takes the value one if the bank created a specific provision for the firm and zero otherwise. Therefore, a firm with a value of one is perceived as riskier than a firm with a value of zero.

3. **Interest coverage ratio:** Measured as the ratio of financing expenses (in general, interest expenses) to total revenue. Therefore, a lower ratio indicates a higher probability that the firm will be able to cover its debt and vice versa.

4. **Proportion of fixed assets within total assets:** Measured by the proportion of fixed assets (including physical assets, such as land, buildings, machinery, vehicles, equipment, etc. which are presented at cost, adjusted for inflation and reported net of accumulated depreciation) within the total balance sheet. This ratio serves as a measure of the quality of the firm's collateral.

5. **Profitability ratios**

- **Return on assets (ROA):** Measured by the rate of profit before taxes relative to total assets. A higher ROA indicates that the firm is successfully producing profits from its assets and therefore is more efficient.
- **Return on sales:** Measured by the rate of profit before taxes relative to total revenue. A declining ratio over time indicates that the expenses of the firm are growing at a faster rate than its revenues. This phenomenon is apparently the result of operating inefficiencies, erosion of profit margins and the like.

6. **Liquidity ratio (current ratio):** Measured by the ratio between current assets and current liabilities. This ratio describes the firm's ability to cover its current liabilities from its current assets. A higher and positive ratio indicates that the firm is better able to finance its liabilities. This in turn is evidence of a lower chance of liquidity shortages and therefore is an indicator of stability. In contrast, a lower or even negative ratio indicates a declining ability to finance its liabilities.

7. **Ratio of market value to book value (MV/BV)** (capital multiplier): measured by the ratio of the market value of the firm's share capital to the value of shareholders' equity in its balance sheet. This ratio represents the extent of correlation between the market value of the firm's share capital, as determined by investors, and the book value of its shareholders' equity. A higher ratio indicates that investors perceive the firm to have a high potential and

[10] It should be mentioned that in this study we modified the various credit ratings to fit on a common scale since there is no uniform rating system among the banks.

[11] See Crouhy, Galai and Mark (2001).

vice versa (see Rothenberg and Pearl, 2005). Therefore, this ratio serves as a measure of quality of the firm's project or the potential of its assets.

4. EMPIRICAL ANALYSIS

This section analyzes the factors determining the probability that a firm with bank credit will issue bonds on the TASE and presents the result of the various models. The statistical analysis is carried out using two approaches:

First approach: In this approach, it is assumed that firms with bank credit who have issued bonds on the TASE[12] constitute a homogenous group and compares this group to firms with bank credit who have not issued bonds on the TASE.

Second approach: This approach assumes that there are essentially three groups of firms with bank debt:

Group 1: Firms that have not raised funds by issuing bonds on the TASE.

Group 2: Firms that have issued high-quality bonds on the TASE whose yield-to-maturity is lower or equal to the average for BBB-rated bonds.

Group 3: Firms that have issued risky bonds on the TASE whose yield-to-maturity is higher or equal to the average for BBB-rated bonds.[13]

An additional distinction was made in this approach with regard to the date of the firm's initial bond issue on the TASE. Since we hypothesize that firms which have issued bonds on the TASE prior to 2006 have different characteristics than those which issued bonds subsequently, we chose 2006 as the dividing point between the two groups in the sample. We believe that a large number of firms entered the capital market that year in order to take advantage of the favorable conditions (number of issues and low yields) in the capital market.

a. The first approach

The statistical analysis was carried out using two methods:

Univariate analysis which involves the comparison of each of the relevant independent variables according to two different groups: firms with bank credit that issued bonds on the TASE during the period 2003–6.2007 and firms with bank credit who did not raise funds through the issue of bonds on the TASE.

[12] This study includes only firms that have issued bonds on the TASE and ignores firms that have issued bonds abroad. According to the data, the proportion of firms that preferred to issue bonds on stock exchanges abroad is relatively small. We would mention that the proportion of bonds issued in Israel within total capital raised in Israel is about 70 percent.

[13] The division of firms that have issued bonds on the TASE into two groups was carried out on the basis of the yield-to-maturity of their bonds as of June 2007. Firms whose bonds had an average yield-to-maturity of less than 6 percent were defined as high-quality firms while those with a higher yield-to-maturity were defined as risky firms. We would mention that during the sample period the yield-to-maturity of 5-year government bonds stood at about 3 percent and that of BBB-rated bonds stood at about 6 percent.

A **Logit model** in which the dependent variable can receive one of two values: one if the firm privately issued bonds during the last two years and zero otherwise. The independent variables include the firm's credit rating and its financial ratios, which reflect, among other things, the firm's profitability, risk, size, etc.

1. *Univariate statistical analysis*

Table 1 presents a comparison between firms with bank debt who issued bonds on the TASE during the period 2003–6.2007 and firms with bank debt who did not. The comparison is carried out according to the financial ratios that we believe have an effect on the firm's decision whether or not to issue bonds, with focus on the median values.

Table 1
Firms with bank debt: Comparison between firms that issued bonds on the TASE during the period 2003–6.2007 and firms that did not (quarterly data)

	Median		5th percentile		95th percentile	
	Did not issue bonds	Issued bonds	Did not issue bonds	Issued bonds	Did not issue bonds	Issued bonds
Size (total assets in millions of NIS)	537.7	1,468.9*	114.5	159.9	5,191.3	15,463.6
Credit rating (scale of 0-100)	41.6	34.5*	23.7	20.6	75.2	56.5
Volatility of profit (quarterly standard deviation of pre-tax profit divided by total assets during the last three years in percent)	5.8	3.5*	1.4	0.7	18.4	17.0
Financial leverage (total liabilities divided by total assets in percent)	78.5	77.4	45.7	53.2	103.7	95.4
Interest coverage ratio (financing expenses divided by total revenues in percent)	4.0	6.0	0.0	0.8	44.0	48.3
Proportion of fixed assets within total assets (in percent)	23.1	21.9	0.3	0.0	86.0	83.5
Profitability 1 (ROA) (pre-tax profit divided by total assets in percent)	1.7	2.6	-9.4	-1.3	13.3	11.6
Profitability 2 (pre-tax profit divided by total sales in percent)	2.1	7.4*	-38.0	-6.1	24.3	45.2
Liquidity ratio (current assets divided by current liabilities)	1.0	1.1	0.2	0.1	2.4	2.9
Ratio of market value to book value (MV/BV)	1.5	1.6	0.6	0.8	6.2	3.8

(*) Indicates a significant difference at a level of at least 5% between the medians of the two groups according to the Kruskal-Wallis test for comparing medians.

Table 1 indicates the following:

1) Firms that have issued bonds on the TASE are significantly larger than firms who depend on bank credit only. Thus, the median value of assets for firms that have issued bonds is about NIS 1,469 million while for firms that have not it is only about NIS 538 million.[14] This conclusion is consistent with the findings of other relevant studies.[15]

2) Firms that have issued bonds represent a lower level of credit risk than firms that have not.[16] The analysis of credit risk was based on a variable unique to this study, i.e., the credit rating reported in the Credit Exposure Report, which indicates that the median credit risk of firms that have issued bonds is relatively low[17] while firms that did not issue bonds represent an intermediate level of risk. This result is also consistent with Diamond (1991)'s theory with respect to monitoring by a commercial bank and its effect on the firm's problem of moral hazard. The volatility in a firm's profitability also indicates that credit risk is lower among firms that issued bonds. In contrast, the leverage ratio, which also represents risk, did not show a significant difference between the two groups.

3) The analysis of profitability as measured by the ratio of pre-tax profit to total sales (profitability 2) indicates that firms which issued bonds on the TASE are more profitable than those that did not. No difference was found between the groups with respect to the interest coverage ratio, the liquidity ratio, the ratio of fixed assets to total assets and the ratio of market value to book value.

2. *The Logit model*

$$(1) \quad \log it(p_i) = \log\left(\frac{p_i}{1-p_i}\right) = \beta \underline{X_i}$$

where

i = firm i.
p_i = the probability that firm i will issue bonds on the TASE.
$\underline{X_i}$ = vector of independent variables for firm i.

[14] It should be mentioned that the sample of firms that did not issue bonds, which was used to evaluate the population of firms with bank credit who did not issue bonds, only includes public companies (as opposed to privately-held companies). In other words, there is a problem here of selection bias. However, since an examination of the data shows that the private firms that were not included in the sample are significantly smaller than public firms that did not issue bonds, we assume that the selection bias does not distort the results.

[15] See the survey of the literature above.

[16] Since an examination of the data shows that the average credit rating of private firms that were not included in the sample is not significantly different from that of public firms that have not issued bonds, we assumed that this would not distort the results of the test.

[17] Credit rating was measured on a scale of 0–100. A lower rating indicates higher credit quality. Thus, for example, a credit rating of 0–36 indicates low risk, 37–47 indicates medium risk and 58–100 indicates high risk.

β = vector of the marginal addition to the log of the odds ratio. For example, if the explanatory variable is the log of total assets, then the log of the odds ratio relates to the marginal addition of each increase of one unit in the log of total assets.

Table 2 presents the results of the Logit model regressions on the basis of data for 165 firms. The regressions make it possible to predict whether a firm with bank debt will issue bonds. The dependent variable is the natural log of the odds ratio *P* over (1-*P*) that a firm with outstanding bank credit will in parallel issue bonds on the TASE.

Table 2
Result of the Logit regressions[1]

Variable	Regression 1	Regression 2	Regression 3	Regression 4
Intercept[2]	-6.38 (0.00)	-4.74 (0.00)	-5.56 (0.00)	-7.2 (0.00)
Size – log of total assets (NIS)	0.48 (0.00)	0.44 (0.00)	0.50 (0.00)	0.58 (0.00)
Credit rating		-0.03 (0.03)	-0.02 (0.05)	
Dummy for the construction and real estate industry			0.47 (0.01)	0.62 (0.00)
Profitability 1 (pre-tax profit divided by total assets)				0.06 (0.04)
Dummy for specific loan loss provision				0.40 (0.21)
Ratio of fixed to total assets				-0.82 (0.20)
R-Squared	0.10	0.13	0.16	0.17

[1] Levels of significance appear in parentheses.
[2] The presence of an intercept ensures equality between the number of firms expected to issue bonds and the number of firms that actually do so.

In Regression 1, firm size is the only independent variable. It was found to have a positive and significant effect on the probability of issuing bonds on the TASE.[18]

Regression 2 adds credit rating, which was found to have a negative effect on the probability of issuing bonds on the TASE. In other words, higher credit risk lowers the probability of issuing bonds on the TASE. Regression 3 adds a dummy variable for the

[18] It should be mentioned that a test was done for a single borrower dummy variable, which takes a value of one if the single borrower constraint was effective during the period or if the firm belonged to the group of six largest borrowers and zero otherwise. It was found that there is a link between being a single borrower and the probability of issuing bonds; however, since this variable is correlated with the size of the firm and the size of the firm was found to have higher explanatory power, it was not included in the above regressions. In view of this result, it can be concluded that the size of the firm raises the probability of issuing bonds both from the demand side since it is easier to approach the capital market and from the supply side since it is harder to obtain bank credit due to the single borrower constraint on the banks.

building and real estate industry, which showed that a firm in the building and real estate industry[19] has a higher probability of issuing bonds relative to other industries.

Regression 5 adds the following variables: profitability of the firm, a dummy variable for specific provisions made by the bank for the firm and the ratio of the firm's fixed assets to its total assets. In this context, the firm's profitability was found to have a positive and significant effect while the rest of the variables added in this stage were not found to be significant. It is worth mentioning that the credit rating variable was not included in Regression 4 due to the high correlation between it and the size of the firm and its profitability.

In conclusion, it can be said that both of the methods indicate a higher probability that high-quality firms, i.e., large firms with high profitability and low risk, will issue bonds on the TASE. In addition, a firm in the construction and real estate industry has a higher probability of issuing bonds on the TASE.

b. The second approach

This approach essentially assumes that there are three groups of firms with bank credit: firms with bank debt that have not raised funds by issuing bonds on the TASE during the period 2003–6.2007, firms that have issued high-quality bonds on the TASE and firms that have issued risky bonds on the TASE. Also in this case, two statistical methods were used:

Univariate analysis, which compares each of the independent variables, although in this case according to a division into three groups.

The **multinomial Logit model** in which the dependent variable receives a value of one if the firm did not issue bonds on the TASE during the sample period; a value of two if the firm issued high-quality bonds on the TASE during the sample period; and a value of three if the firm issued risky bonds on the TASE during the sample period. The independent variables include financial ratios that reflect, among other things, the firm's risk and size.

We also examined the date on which the firm first issued bonds on the TASE and chose the year 2006 as the dividing point between the two sub-periods (see subsections (3) and (4).

1. *Univariate Analysis*

Table 3 presents an analysis of the median values of the parameters that influenced the decision of the three groups of firms described above during the sample period, i.e., 76 firms that did not issue bonds on the TASE, 55 firms that issued high-quality bonds on the TASE and 17 firms that issued risky bonds on the TASE. For a breakdown of the firms by industry, see the appendix.

[19] An analysis of the data shows that the total credit extended to real estate firms has in recent years caused a number of banks to come very close to the industry credit constraint (according to which total credit to a particular industry will not exceed 20 percent of total bank credit). Therefore, the issue of bonds by a number of large real estate firms enabled the banks to remain within the industry credit constraint.

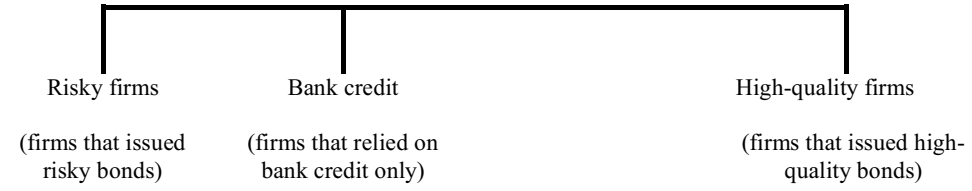
Table 3
Firms with bank debt: Comparison of medians between firms that issued high-quality bonds, firms that issued risky bonds and firms that did not issue bonds (quarterly data for the period 2003–6.2007)

	Did not issue bonds	Issued high-quality bonds	Issued risky bonds
Size (total assets in millions of NIS)	537.7	2,649.8*	324.5**
Credit rating (scale of 0–100)	41.6	34.0*	44.0
Volatility of profit (quarterly standard deviation of pre-tax profit divided by total assets during the last three years in percent)	5.8	3.0*	5.1
Financial leverage (total liabilities divided by total assets in percent)	78.5	76.3	87.9**
Interest coverage ratio (financing expenses divided by total revenues in percent)	4.0	8.4	7.2
Proportion of fixed assets within total assets (in percent)	23.1	27.4	15.6**
Profitability 1 (ROA) (pre-tax profit divided by total assets in percent)	1.7	2.8**	0.3*
Profitability 2 (pre-tax profit divided by total sales in percent)	2.1	12.4*	0.2
Liquidity ratio (current assets divided by current liabilities)	1.0	1.1	1.2
Ratio of market value to book value (MV/BV)	1.5	1.5	1.4

Asterisks indicate a significant difference at a level of at least 5 percent (*) or 10 percent (**) between the median of the group that issued bonds and that of the group that did not, according to a Kruskal-Wallis test for the comparison of medians.

Table 3 shows that firms which issued high-quality bonds on the TASE are significantly larger than those who relied only on bank debt. Thus, the median value of total assets for these firms was about NIS 2,650 million while that of firms which did not issue bonds was only about NIS 538 million. In addition, we found that firms that issued risky bonds are of smaller size than firms that relied only on bank credit. In other words, firms issuing bonds are to be found at the two extremes of the spectrum, such that large firms issued high-quality bonds while small firms issued risky bonds. Between these two extremes (but closer to firms that issued risky bonds) are firms who relied only on bank credit (see Figure 2).

Figure 2
The average size of firms with bank credit



The data also show that firms which issued high-quality bonds represent a lower level of credit risk relative to those that did not, while there was no significant difference in credit rating between firms that did not issue bonds and firms that issued risky bonds. This is an indication that the choice between bank credit and issuing bonds is not linear and firms that issue bonds can be found at the two extremes of the risk spectrum. This result is also obtained from the volatility of profitability, which is also an indicator of the firm's risk.

In addition, the data indicate that firms issuing bonds can be found at the two extremes of the profitability spectrum, such that firms which issued high-quality bonds are those with the highest levels of profitability while firms that issued risky bonds are those with the lowest. Between them are firms that did not issue bonds at all and which relied only on bank credit. Firms that issued risky bonds were also found to have a significantly[20] lower ratio of fixed assets to total assets (which constitutes an index of the quality of collateral) than firms that had not issued bonds.

No significant difference was found between firms that had issued bonds (whether risky or high-quality) and those that had not with respect to the following ratios: interest coverage, liquidity and market value to book value.

2. *The Multinomial Logit Model*

This method is appropriate for non-ordinal categories (groups).[21] We divided the population of firms into three groups:

Group 1 – Firms that did not issue bonds on the TASE.

Group 2 – Firms that issued high-quality bonds on the TASE.

Group 3 – Firms that issued risky bonds on the TASE.

Group 1 was chosen as the basis for comparison. Therefore, the odds ratio can be written as follows:

$$(2) \quad \log\left(\frac{p_{i2}}{p_{i1}}\right) = \beta_2 \underline{x}_i$$

$$(3) \quad log\left(\frac{p_{i3}}{p_{i1}}\right) = \beta_3 \underline{x}_i$$

where:

p_{i1} = the probability that firm i will not issue bonds on the TASE.

p_{i2}= the probability that firm i will issue high-quality bonds on the TASE.

p_{i3} = the probability that firm i will issue risky bonds on the TASE.

$p_{i1}+p_{i2}+p_{i3}= 1$

$\underline{X}_i$ = vector of independent variables for firm i.

[20] At a level of 10 percent.

[21] The analysis was carried out using the SAS program with link=glogit, proc logistic. For further details, see Allison (1999).

β_2 = vector of the marginal addition to the log of the odds ratio of belonging to the group of firms that issued high-quality bonds relative to the reference group (i.e., firms that did not issue bonds) in comparison to financing with bank credit only, i.e., when β_2 is positive. In other words, the probability that the firm will issue high-quality bonds as opposed to depending only on bank credit increases as the independent variable increases and when β_2 is negative the probability that the firm will issue high-quality bonds increases as the independent variable decreases.

β_3 = vector of the marginal addition to the log of the odds ratio of belonging to the group of firms that issued risky bonds relative to the reference group, i.e., firms that did not issue bonds.

Table 4 presents the regression results for the multinomial Logit model. The analysis is based on 148 firms,[22] where the reference group for each regression is Group 1 (the firms that did not issue bonds on the TASE during the sample period and preferred to rely on bank credit only).

Regression 1 includes the size of the firm as the only independent variable, which was found to have a positive and significant effect on the probability of issuing high-quality bonds on the TASE relative to not issuing bonds (bank credit only) and a negative and significant effect on the probability of issuing risky bonds on the TASE relative to not issuing bonds. Regression 2 adds credit rating, which is found to have a negative and significant effect on the probability of issuing high-quality bonds on the TASE relative to not issuing bonds. In other words, the probability of issuing high-quality bonds on the TASE relative to not issuing declines as the credit rating of the firm increases (i.e., as the risk of the firm increases). The coefficient of credit rating was not found to be significant for issuing risky bonds. Regression 3 adds a dummy variable for the building and real estate industry, which was found to have a positive and significant effect on the issuing of both high-quality and risky bonds. In other words, belonging to the construction and real estate industry increases the probability of issuing bonds of either type relative to other industries. This result is reflected in the sample's breakdown by industry: 18 percent of firms in the construction and real estate industry issued risky bonds as opposed to only 8 percent of firms in other industries. The proportion of firms that issued high-quality bonds in the construction and real estate industry is also higher than in other industries (46 percent versus 32 percent) (see appendix).

Regression 4 adds the following variables: profitability, the interest coverage ratio and the ratio of fixed assets to total assets. Of these, profitability was found to have a positive and significant effect on the probability of issuing high-quality bonds while the existence of a specific provision had a positive and significant effect on the probability of issuing risky bonds.[23]

[22] This is lower than the number of firms in the sample used in the first approach since public firms whose bonds are not traded were omitted.

[23] As mentioned above, firms that issued bonds and are not included in the Credit Exposure Report were not included n the sample. It is possible that some of them did not have the option of obtaining bank credit. A comparison between the firms that issued bonds on the TASE and were included in the Credit Exposure Report and firms that issued bonds but were not included in the Credit Exposure Report shows that there is a significant difference in characteristics between the two groups. Thus, it was found that firms that were

Table 4
Results of the multinomial Logit regressions[1] with differentiation between high-quality and risky bonds

Variable	Group (in comparison to Group 1)	Regression 1	Regression 2	Regression 3	Regression 3
Intercept	3	5.52 (0.07)	5.40 (0.10)	4.52 (0.19)	7.40 (0.03)
Intercept	2	-11.76 (0.00)	-9.58 (0.00)	-10.81 (0.00)	-13.60 (0.00)
Size (log of total assets in NIS)	3	-0.54 (0.02)	-0.58 (0.02)	-0.51 (0.05)	-0.59 (0.03)
Size (log of total assets in NIS)	2	0.82 (0.00)	0.79 (0.00)	0.87 (0.00)	0.99 (0.00)
Credit rating	3		0.01 (0.52)	0.01 (0.49)	
Credit rating	2		-0.04 (0.01)	-0.04 (0.04)	
Dummy for the building and real estate industry	3			0.65 (0.03)	0.70 (0.03)
Dummy for the building and real estate industry	2			0.58 (0.01)	0.83 (0.00)
Profitability 1 (pre-tax profit divided by total assets)	3				0.03 (0.57)
Profitability 1 (pre-tax profit divided by total assets)	2				0.09 (0.02)
Dummy for a specific loan loss provision	3				1.12 (0.00)
Dummy for a specific loan loss provision	2				0.34 (0.40)
Ratio of fixed assets to total assets	3				-2.11 (0.10)
Ratio of fixed assets to total assets	2				-0.76 (0.31)
R^2		0.26	0.31	0.35	0.39

[1] The values in parentheses are levels of significance.

not included in the Credit Exposure Report are riskier, i.e., smaller with lower profitability and higher volatility of profits.

It is possible to conclude, at this stage, that firms which issued bonds can be found at the two extremes of the risk spectrum. Firms that issued high-quality bonds on the TASE can be characterized as large, profitable and low-risk while firms that issued risky bonds on the TASE can be characterized as primarily small firms with a level of risk somewhat higher than that of firms which did not issue bonds and who preferred to obtain bank credit.

3. *Univariate Analysis*

Table 5 presents a comparison of the median values of the parameters that affect the decisions of the three groups of firms that financed with bank credit during the sample period, where the groups are differentiated by the date of the initial issue of bonds (with 2006 as the dividing point between the two sub-periods). These groups include 76 firms that did not issue bonds on the TASE, 51 firms that issued bonds on the TASE for the first time prior to 2006 and 35 firms that issued bonds on the TASE in 2006 or later. (See the appendix for a breakdown of these firms by industry.)

According to Table 5, firms that issued bonds on the TASE for the first time prior to 2006 had a number of characteristics that are significantly different from those of firms that relied only on bank credit. In other words, they are larger, less risky (which is reflected in a lower credit rating and lower volatility of profits) and more profitable. Firms that issued bonds for the first time in 2006 or later were not found to have characteristics that were significantly different from those of firms that relied only on bank credit, apart from the ratio of fixed assets to total assets which was significantly lower among firms that issued bonds after 2006.

4. *The Multinomial Logit Model*

This method is appropriate for non-ordinal categories (groups).[24] The population was divided into three groups:

Group 1: Firms that did not issue bonds on the TASE.

Group 2: Firms that issued bonds for the first time on the TASE prior to 2006.

Group 3: Firms that issued bonds on the TASE in 2006 or after.

Table 6 presents the results of the multinomial Logit regressions. The analysis is based on a sample of 162 firms, where, as before, the reference group for each regression is Group 1, i.e., firms that did not issue bonds on the TASE during the sample period and preferred to rely on bank credit only.

[24] The analysis was carried out using the SAS program with link=glogit, proc logistic. For further details, see Allison (1999).

Table 5

Firms with bank credit: A comparison of medians between firms that issued bonds for the first time prior to 2006, firms that issued bonds for the first time in 2006 or later and firms that did not issue bonds (quarterly data for the period 2003–6.2007)

	Did not issue bonds	Issued bonds for the first time prior to 2006	Issued bonds for the first time in 2006 or later
Size (total assets in millions of NIS)	537.7	2,758.0*	774.5
Credit rating (scale of 0–100)	41.6	34.0*	40.6
Volatility of profits (quarterly standard deviation of pre-tax profit divided by total assets during the last three years in percent)	5.8	3.3*	3.5
Financial leverage (total liabilities divided by total assets in percent)	78.5	76.3	80.2
Interest coverage ratio (financing expenses divided by total revenues in percent)	4.0	6.1**	5.8
Proportion of fixed assets within total assets (in percent)	23.1	31.2	15.0*
Profitability 1 (ROA) (pre-tax profit divided by total assets in percent)	1.7	2.7**	1.9
Profitability 2 (pre-tax profit divided by total sales in percent)	2.1	7.5*	7.4
Liquidity ratio (current assets divided by current liabilities)	1.0	1.2	1.0
Ratio of market value to book value (MV/BV)	1.5	1.6	1.4

Asterisks indicate a significant difference at a level of at least 5 percent (*) or 10 percent (**) between the median of the group that issued bonds and that of the group that did not, according to a Kruskal-Wallis test for the comparison of medians.

Table 6
Results for the multinomial Logit[1] regressions
Differentiation between bonds issued prior to 2006 and from 2006 onward

Variable	Group (in comparison to Group 1)	Regression 1	Regression 2	Regression 3	Regression 3
Intercept	3	-2.55 (0.22)	-1.90 (0.40)	-2.44 (0.29)	-2.93 (0.19)
Intercept	2	-10.59 (0.00)	-8.21 (0.00)	-9.62 (0.00)	-11.97 (0.00)
Size (log of total assets in NIS)	3	0.13 (0.39)	0.13 (0.42)	0.17 (0.29)	0.22 (0.19)
Size (log of total assets in NIS)	2	0.73 (0.00)	0.67 (0.00)	0.77 (0.00)	0.86 (0.00)
Credit rating	3		-0.01 (0.35)	-0.01 (0.40)	
Credit rating	2		-0.04 (0.02)	-0.03 (0.05)	
Dummy for the building and real estate industry	3			0.34 (0.13)	0.47 (0.05)
Dummy for the building and real estate industry	2			0.61 (0.00)	0.78 (0.00)
Profitability 1 (pre-tax profit divided by total assets)	3				0.05 (0.12)
Profitability 1 (pre-tax profit divided by total assets)	2				0.07 (0.07)
Dummy for a specific loan loss provision	3				0.49 (0.17)
Dummy for a specific loan loss provision	2				0.38 (0.32)
Ratio of fixed assets to total assets	3				-1.36 (0.10)
Ratio of fixed assets to total assets	2				-0.45 (0.54)
R^2		0.16	0.20	0.23	0.25

[1] The values in parentheses are levels of significance.

The results of the regressions indicate that firms which issued bonds for the first time prior to 2006 can be characterized as large, profitable and low-risk (which is reflected in a low credit rating) relative to firms that preferred to rely on bank credit alone, while firms that issued bonds for the first time in 2006 or later (apart from those in the construction and real estate industry and firms with lower levels of investment in fixed assets) are not significantly different from those that relied on bank credit only.[25]

[25] It should be mentioned that in this sample, which included only firms with bank credit, the share of the firms that issued bonds for the first time prior to 2006 within total issues of bonds on the TASE during the

5. SUMMARY AND CONCLUSIONS

This study has examined the characteristics of firms with bank credit who took advantage of the booming capital market to raise funds through the issue of bonds. Our objective was to examine the effect of the expanded nonbank credit market on the banking system's credit risk.

An analysis of the data was performed using two approaches: The **first approach** differentiated between firms that issued bonds on the TASE during the period 2003–6.2007 and those that did not. In other words, this approach treated the group of firms that issued bonds on the TASE as homogenous. The **second approach**, differentiated between three groups, where the group that issued bonds was divided into two sub-groups: firms that issued high-quality bonds and firms that issued risky bonds.

The analysis of the data was carried out for each of the approaches using two statistical methods: univariate analysis and Logit regressions.

The results of the first approach indicate that firms which issued bonds on the TASE in recent years were primarily high-quality firms, i.e., large, low-risk and profitable firms.

The results of the second approach, which differentiated between firms that issued high-quality bonds and firms that issued risky bonds, showed that firms which issued bonds during the last four years were to be found at the two extremes of the risk spectrum. Firms that issued high-quality bonds on the TASE were characterized as low-risk and were found to be large and highly profitable while firms that issued risky bonds tended to be small firms with a low level of profitability and a level of risk slightly higher than that of firms that did not issue bonds and preferred to use bank credit only. An additional distinction was made between firms that issued bonds for the first time prior to 2006 and those that issued bonds in 2006 or later. The results indicate that firms which issued bonds for the first time prior to 2006 tended to be larger with a lower level of risk and a higher level of profitability than firms that preferred to rely on bank credit only, while firms that issued bonds for the first time in 2006 or later were not significantly different from firms that preferred to rely on bank credit only.

In addition, it is worth mentioning that according to both approaches firms in the construction and real estate industry have a higher probability of issuing bonds on the TASE.

The results have direct implications for the structure of the banks' credit portfolio and its risk. Thus, according to the results, it appears that while high-quality firms have tended to raise funds in the bond market in recent years, partly at the expense of bank credit, riskier firms remained with the banks, even though some lower-quality firms did issue bonds on the TASE during this period.[26] Due to the relatively low proportion of risky firms, it

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years 2006–7 was about 65 percent, while firms that issued bonds from 2006 and onward accounted for only 35 percent. In other words, the effect of belonging to the group that first issued bonds prior to 2006 is dominant in its the effect on the probability of issuing bonds on the TASE during the sample period, including the years 2006–7. This result is consistent with the results of the first approach, according to which high-quality firms had a higher probability of issuing bonds on the TASE.

[26] An analysis of the data shows that risky firms also issued bonds on the TASE during the boom in the economy and on the stock exchange. However, the share of these firms is significantly smaller than that of

appears that the quality of the bank's commercial credit portfolio has deteriorated although at the same time there has been an improvement in its level of concentration. The entry of large borrowers into the bond market (and in particular those in the building and real estate industry) has led to a decline in their share of the commercial credit portfolio and greater diversification of the portfolio across borrowers and industries.[27]

In this context, it is worth mentioning that aggregate statistical data (such as the ratio of provisions for doubtful debts to total credit, the ratio of total credit to GDP, etc.) point to an improvement in the implicit risk of the banks' credit portfolio in recent years (see Israel's Banking System 2006). It appears that this improvement was related to the increase in turnover in the economy (i.e., accelerated growth) and in the capital market, in spite of the decline in the quality of the bank credit portfolio that was the result of the entry of high-quality firms into the capital market and the resulting competitive threat to the banking system.

Although we did not examine the probability of issuing bonds on the TASE over a whole business cycle, it is possible—based on studies in other countries (such as Cantilo and Wright, 2000)—to forecast the effect of the slowdown in the economy and the capital market on future issues of bonds. It has been observed in other countries that during an economic slowdown only particularly high-quality firms continue to issue bonds, while the lowest-quality firms and some of the intermediate firms increase their demand for bank credit. In our estimation, a similar process will take place in Israel; on the other hand, we have no information on the future mix of firms that will return to the banking system and therefore we cannot predict the effect that this potential effect will have on the quality of the banks' credit portfolio. Nonetheless, in our opinion, the mix of firms that will increase their demand for bank credit will be affected to a large extent by the risk management policy (a reduction in credit or a filtering of customers) that will be adopted by the banks at that time.

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high-quality firms that issued bonds on the TASE. Therefore, high-quality firms that issued bonds are dominant in the determination of the quality of the credit portfolio.

[27] It should be emphasized that firms without bank credit were responsible for part of the growth in the non-bank credit market in recent years. It is reasonable to assume that a large proportion of these firms could not obtain bank credit since the intended use of the credit and its implicit risk were not consistent with the banks' credit policy (real estate ventures in Eastern Europe, for example). These firms are characterized by a significantly higher level of risk than firms that issued bonds and also have bank credit. We would emphasize that this study did not deal with firms of this type but only with firms that have bank credit.

Appendix

The breakdown by industry of firms that were included in the first and second samples:

Table A1
Breakdown of the sample of firms in the first approach by industry

Industry	Did not issue bonds	Issued bonds	Total
Construction and real estate	22	37	59
Hotels	4	-	4
Manufacturing	18	10	28
Commerce and services	10	16	26
Communication and computers	11	4	15
Holding companies	12	21	33
Total	**77**	**88**	**165**

Table A2
Breakdown of the sample of firms in the second approach by industry: Differentiation between high-quality bonds and risky bonds

Industry	Did not issue bonds	Issued high-quality bonds	Issued risky bonds	Total
Construction and real estate	21	26	10	57
Hotels	4	-	-	4
Manufacturing	18	5	2	25
Commerce and services	10	8	1	19
Communication and computers	11	1	1	13
Holding companies	12	15	3	30
Total	**76**	**55**	**17**	**148**

Table A3
Breakdown of firms by industry

Industry	Did not issue bonds	Issued bonds prior to 2006	Issued bonds in 2006 or later	Total
Construction and real estate	21	23	14	58
Hotels	4	-	-	4
Manufacturing	18	6	4	28
Commerce and services	10	10	5	25
Communication and computers	11	-	3	14
Holding companies	12	12	9	33
Total	**76**	**51**	**35**	**162**

REFERENCES

Allison, P. (1999). "Logistic Regression Using the SAS System: Theory and Application", Chapter 5.

Berlin, M. and Loeys, J. (1988). "Bond Covenants and Delegated Monitoring", *Journal of Finance* 43(2), 397-412.

Cantillo, M. and Wright, J. (2000). "How Do Firms Choose their Lenders? An Empirical Investigation", *Review of Financial Studies* 13(1), 155-189.

Chemmanur, T. and Fulghieri, P. (1994). "Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt", *The Review of Financial Studies* 7(3), 475-506.

Crouhy, M., Galai, D. and Mark, R. (2001). "Risk Management", Chapter 7.

Datta, S., Datta, M. and Patel, A. (1999). "Bank Monitoring and the Pricing of Corporate Public Debt", *Journal of Financial Economics* 51, 435-449.

Denis, D. and Mihov, V. (2003). "The Choice Among Bank Debt, Nonbank Private Debt and Public Debt: Evidence from New Corporate Borrowings", *Journal of Financial Economics* 70, 3-28.

Diamond, D. (1991). "Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt", *Journal of Political Economy* 99(4), 689-721.

Fama, E. (1985). "What's Different about Banks?", *Journal of Monetary Economics* 15, 29-39.

Geva, D. and Goldshmidt A. (1985). "The Role of Bank Credit Rationing in the Determination of the Interest Rate", Banking Issues 5, 27-39. (Hebrew)

Hadlock, C. and James, C. (2002). "Do Banks Provide Financial Slack?", *The Journal of Finance* 57, 1383-1419.

Johnson, S. (1997). "An Empirical Analysis of the Determinants of Corporate Debt Ownership Structure", *Journal of Financial and Quantitative Analysis* 32(1), 47-69.

Krishnaswami, S., Spindt, P. and Subramaniam, V. (1999). "Information Asymmetry, Monitoring, and the Placement Structure of Corporate Debt", *Journal of Financial Economics* 51, 407-434.

Rajan, R. (1992). "Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt", *Journal of Finance* 47(4), 1367-1400.

Ruthenberg, D. and Pearl, S. (2005). "Market-to-Book Value Ratio in Banking - The Israeli casel", *Issues in Banking* 17, 5-37. (Hebrew)

Shirasu, Y and Xu, P. (2007). "The Choice of Financing with Public Debt versus Private Debt: New Evidence from Japan After Critical Binding Regulations were Removed", *Japan and the World Economy* 19, 393-424.