Israel Economic Review Vol. 8, No. 2 (2010), 35–65

# HOW DOES THE QUALITY OF CORPORATE GOVERNANCE AFFECT THE MARKET VALUE OF BUSINESS FIRMS IN ISRAEL?[1]

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Abstract

In this study we construct, for the first time in Israel, an index for ranking the quality of corporate governance of Israeli firms. The index, based mainly on principles that are common in existing international indices, focuses on four main topics (the abilities of the board of directors, audit and control, ethics and honesty, and transparency), and it includes 19 variables. An empirical analysis of 173 public companies (included in the TASE 100 and YETER 150 at the end of 2005) finds the following: 1. Disperse ownership companies and companies with a higher return on equity have better quality corporate governance; 2. There is a significant positive correlation between our index ranking the quality of corporate governance and a firm's relative value (Tobin's Q); The causality of this relation is, however, unknown, i.e., we do not show or argue that better corporate governance increases firm valuation; 3. The existence of an ethical code, few transactions with interested parties, early publication of periodical reports and the inclusion of a small number of directors who are also employees of the corporation, are components of the index that are most strongly correlated with the value of the firm; 4. Dual companies have a higher level of corporate governance and higher Q values.

## 1. INTRODUCTION

One of the main targets of the regulation of capital market is to create 'proper corporate governance,' i.e., to define a series of principles, rules and regulations that will guarantee the responsible and fair behavior of a company and its directors vis-à-vis the small investors in that company. Proper corporate governance is expected to reduce the risk to small investors and prevent misbehavior of firm managers and controlling shareholders.

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[1] We would like to thank Yishay Yaffe, Eugene Kandel and the referee for their useful comments. We are also grateful to the Pinhas Sapir Economic Policy Forum and to the Raymond Ackerman Family Chair in Israeli Corporate Governance for their financial support of our research. Any remaining errors are our own.

Israel's Securities Authority appointed the Goshen Committee to examine the structure and composition of proper principles of corporate governance in Israel. The committee's recommendations, that were adopted by the Authority in December 2006, focused primarily on improving the independence and abilities of the board of directors, enhancing the work of the audit committee, increasing the quality of reporting and disclosure of corporations, and establishing a court specializing in corporate and securities law. In July 2007 the Authority ratified a regulation requiring all companies listed on the stock exchange to disclose details regarding the implementation of the recommendations of the Goshen Committee in their Directors' Report.

In this study we construct, for the first time in Israel, an index of the quality of corporate governance based on the technical principles widespread in the world. Our Israeli index (constructed in four versions) consists of four categories: the board of directors; audit and control; ethics and fairness; and transparency. It incorporates 19 variables.

At the first stage, we inquired which factors affected our index of the quality of corporate governance. We found that companies with disperse ownership (i.e., those that did not have a control group) and companies with a higher return on equity, had better quality corporate governance.

At the second stage, we examined whether there exists a correlation between a company's relative value (Tobin's Q) and the quality of its corporate governance. We found that there was a significant positive correlation between the corporation's value and its quality of corporate governance ranking, which suggests the possibility that better quality corporate governance leads to higher company value. We also investigated which components of the index had the greatest impact on the value of a company. We found that the existence of an ethical code, the absence of transactions with interested parties, transparency, and the inclusion of only a few company employees on the board of directors, were the variables with the strongest positive correlation with the value of the company.

At the third and final stage, we examined the effect of dual listing of a company on its value and the quality of its corporate governance. We found that companies with dual listing abroad have a higher level of corporate governance and relative value (Q) than those listed solely on the Tel Aviv Stock Exchange (TASE).

The article is organized as follows: Section 2 reviews the literature and the research hypotheses; in Section 3 we describe our index of the quality of corporate governance; in Section 4 we discuss research methods; section 5 describes the sample; in Section 6 we present and discuss the empirical results; and in section 7 we summarize our conclusions.

## 2. REVIEW OF THE LITERATURE

### a. Indices of corporate governance

Gompers, Ishii and Metrick (2003) were the first to construct an index of corporate governance, henceforth CGI, in the US. Their work was followed by other studies: Bebchuk and Cohen (2005); Cremers and Nair (2005); Core, Guay and Rusticus (2006); Brown and Caylor (2006), Bebchuk, Cohen and Ferrell (2009); and others. This group of studies deals

with the US capital market with its disperse ownership structure, and is concerned primarily with the conflict of interests between shareholders and managers. Thus, the CGI constructed in the US is based on variables describing the balance of power between top managers and shareholders.

Beiner, Drobetz, Schmid and Zimmerman (2006) in Switzerland, Black, Love and Rachinsky (2006) in Russia, Drobetz, Schillhofer and Zimmerman (2004) in Germany, Black, Jang and Kim (2006 a, b) in Korea, Cheung, Connelly, Limpaphayom and Zhou (2007) in Hong Kong, and others, constructed indices of the quality of corporate governance that monitor the balancing mechanisms between 'simple' shareholders from among the public and the holders of a controlling interest in a company. In most countries other than the US, there are controlling shareholders in a company, whether an individual, a family, or a partnership, who control most of the voting power in a company and lead it. The controlling shareholders possess considerable power and can utilize it to exploit the company in ways that increase their own personal utility. Consequently, indices of corporate governance outside the US have included, in addition to parameters of shareholders' rights, parameters monitoring the structure, independence, and *modus operandi* of the board of directors, auditing quality of the company (both internal and external), and the company's public transparency.

**b. Factors affecting the quality of corporate governance**

After constructing the index of the quality of corporate governance, we go on to examine the factors that affect its level. This examination is not often employed by researchers, and in fact only a few, Black, Jang and Kim (2006b) for example, discuss it. They report that there is a significant positive correlation at the 1 percent level between their index, the natural log of total assets, and the weekly standard deviation of the company's stock return. They also find a significant negative correlation at the 5 percent level between their index and the ratio of fixed assets to sales.

In this study we propose adding another two factors to the list of factors potentially affecting CGI:

1. The company's profitability - more profitable companies (companies with a higher return on equity) can afford adopting higher quality and more costly corporate governance standards.

2. The ownership structure - in a disperse ownership company the quality of corporate governance will be higher because there is no controlling shareholder seeking private benefits.

**c. The relation between company value and the quality of its corporate governance**

Many studies, including La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) and Lombardo and Pagano (2006) present the hypothesis that high quality corporate governance increases the value of a company. They claim that investors are prepared to pay more for shares in a company with corporate governance of a higher quality for two main reasons. First, a firm with a relatively sophisticated system for protecting small investors distributes

a larger part of its real profits to investors (as dividends or interest). Second, corporate governance of a high quality reduces the cost of equity, i.e., the required rate of return. This is because investors from the public are more confident that they will receive their fair share, and because these investors save on supervision, audit, and control costs. An increase in the flow to the small investors (the first reason above) and a decline in their risk (the second reason) increase the market value of the company shares.

The effect of the quality of corporate governance on a company's value can be examined in two ways: a) by examining an event, i.e., assessing the response of the company's value to sharp changes in the quality of corporate governance; and b) by cross-sectional or panel regressions (that combine cross section data with time-series data). We begin with the event-analysis evidence.

Governance and accounting scandals in leading public companies led many countries to adopt legislation along the lines of the US Sarbanes-Oxley Act of 2002 (SOX). The objectives of that law were to create proper governance and control mechanisms, reduce the risk to investors, and increase transparency.

Aggarwal and Williamson (2006) examined the effect of the SOX regulation, and found that there was a substantial improvement in corporate governance in the period between 2001 and 2005. Aggarwal et al. (2006) also report a significant positive correlation between the quality of corporate governance and the value of corporations prior to the SOX legislation. However, in the period after the SOX legislation they find a correlation between the quality of corporate governance and the value of the firm only for attributes of good corporate governance that are not included in the law.

Chhaochharia and Grinstein (2007) also examined the effect of the legislation in the US. They find that large companies that were required to make more changes in the wake of the law yielded higher returns than large companies that were required to make fewer changes. On the other hand, the findings for small companies are the opposite. Small companies that were required to make more changes as a result of the law yielded a more negative return than those that had to make only a few changes. Like Linck, Netter and Yang (2009) and Holmstrom and Kaplan (2003), Chhaochharia and Grinstein (2007) argue that the expenditure associated with the implementation of the law constitutes a very heavy economic burden for small companies. Consequently, for small companies the costs of SOX outweigh the benefits.

The conclusion from the literature on the SOX legislation event is that higher quality corporate governance affects positively company's market value.

The strand of studies using cross-sectional regressions yields similar conclusions. Gompers, Ishii and Metrick (2003) examined the correlation between their CGI and the relative value of the company estimated by means of Tobin's Q. They reported that when the quality of a company's corporate governance is higher it attains a higher market value, greater profits and lower capital costs. The authors divided the sample into deciles by the quality of firm corporate governance, and suggested the following strategy: buy an investment portfolio in the top decile (highest quality) of corporate governance, and short the bottom decile of corporate governance. This investment strategy attained a significant excess annual return of 8.5 percent. Cremers and Nair (2005) also endorse this conclusion. They describe a similar investment strategy that yields an excess return of 10 percent.

Bebchuk, Cohen and Ferrell (2009) and Bebchuk and Cohen (2005) construct a parsimonious corporate governance index, and also document a positive correlation between company value and the quality of its corporate governance. Brown and Caylor (2006) also endorse these findings.

Outside the US, Beiner, Drobetz, Schmid and Zimmermann (2006) found a positive correlation between their CGIs and a company's relative value, Q, for a sample of 109 public companies in Switzerland. They claim that the correlation between the value of a company and the quality of its corporate governance is causal, namely, that high quality corporate governance is one of the factors explaining the higher market value.

Black, Love and Rachinsky (2006) focused on a ranking of the quality of corporate governance published by investment banks in Russia. They found a significant positive correlation between a company's value and the quality of its corporate governance in a sample of 99 public companies in Russia. However, in contrast to Beiner, Drobetz, Schmid and Zimmermann (2006), they contend that there is a reverse causal correlation, i.e., that high-value corporations adopt better standards of corporate governance.

Black, Jang and Kim (2006a) examined a sample of 453 public companies in Korea and found a significant positive correlation between their CGI indices and a company's relative value, Q.

Cheung, Connelly, Limpaphayom and Zhou (2007) argue that corporate governance is an important determinant of the value of public companies in Hong Kong. The authors found a significant positive correlation between their CGI and a company's value (measured by its market to book ratio) for 168 public companies.

Note that the literature also includes several articles that did not find a significant correlation between the quality of corporate governance and company value and performance - see Larcker et al. (2007), for example. Nonetheless, consistent with most of the previous studies of the subject, our research hypothesis is that in Israel, too, there is a significant positive correlation between a company's relative value, Tobin's Q, and the quality of its corporate governance.

### d. The effect of a company's dual listing on a foreign stock exchange on the quality of its corporate governance and its value

Stulz (1999), Weisbach and William (2002), and Doidge, Karolyi and Stulz (2004) argue that listing in a country where corporate governance standards are higher, forces a company to be more transparent and to maintain better control and auditing. Klapper and Love (2004) study a sample of large companies from fourteen developing countries. They found that companies in countries with 'weak' corporate governance increased their value by listing on a U.S. stock exchange, where corporate governance regulation is relatively strong.

Our research hypotheses regarding the impact of dual listing are as follows:

1. The quality of corporate governance in dual-listed companies is higher than that of companies listed for trade only in Israel.

2. The relative value of dual-listed companies is higher on average than that of companies listed for trade only in Israel.

## 3. CONSTRUCTING AN INDEX OF CORPORATE GOVERNANCE

In this study we construct, for the first time in Israel, an index ranking the quality of corporate governance. This index is based on the principles and variables used in indices built abroad, with appropriate adjustments for Israel, and with some concessions due to the data limitations in Israel.

Gompers, Ishii and Metrick (2003) were the first to construct an index ranking the quality of corporate governance in the US. Their index included 24 variables describing high-quality corporate governance. Most of those variables emanate from US laws and regulations regarding hostile takeovers. The index was divided into the following five categories: 1. Company's control structure; 2. Shareholders' rights; 3. Protection and indemnity of directors and senior managers; 4. Other forms of protection against a hostile takeover included in the company's articles of association, such as 'fair price' and 'poison pill;' 5. Further protection against a hostile takeover anchored in the laws of the state in which the company was incorporated,

Additional versions of the index of the quality of corporate governance in the US may be found in Brown and Caylor (2006), Cremers and Nair (2005), and Bebchuk, Cohen and Ferrell (2009), among others. These versions are not relevant to Israel and many other countries because they are based on regarding the balance of power between shareholders and managers, i.e., they are intended to prevent problems that are predominant only on the US and perhaps the UK economies.

The agency problem that occurs in Israel and in most other world economies is the imbalance between the power of controlling shareholders and that of small shareholders. The controlling shareholders can extract private benefits for themselves at the expense of the general public. High-quality corporate governance standards guard against exploitations of the company, and reduce the level of private benefits that the controlling shareholders can extract. In many countries the index of the quality of corporate governance is based on the quality of supervision on controlholders and the protection level of the interests of the small shareholders.

Black, Jang and Kim (2006 a,b) used a questionnaire that the Korean Stock Exchange sent to all public companies. On the basis of this questionnaire, the authors constructed an index of the quality of corporate governance in Korea. Their index included 39 variables indicative of the quality of corporate governance. The index was divided into the following five categories: 1. Shareholders' rights; 2. The structure of the board of directors; 3. Procedures and the *modus operandi* of the board of directors; 4. Transparency; 5. The proportion of shares held by the public.

Beiner, Drobetz, Schmid and Zimmermann (2006) constructed an index of the quality of corporate governance in Switzerland. Their index included 38 variables indicative of high quality corporate governance. They constructed a questionnaire, based on the recommendations of the Swiss Code of Best Practice, and sent it to a sample of large public companies in Switzerland. Some of the replies they received were verified by comparing them with information on those companies that had been published publicly. The index was divided into the following five categories: 1. Directors' commitment to good quality

corporate governance; 2. Shareholders' rights; 3. Transparency; 4. The board of directors and senior management; and 5. Audit and reporting.

The Israeli index we construct is based only on information published by public companies in their annual reports. Inevitably, the published information we use is more limited than what could be obtained from a research questionnaire. However, our information is audited and is therefore likely to be slightly more reliable.

The index we build comprises four categories and 19 variables. The four categories are: 1. The board of directors; 2. Audit and control; 3. Ethics and fairness; and 4. Transparency. The variables included in our corporate governance index are presented in Table 1.

**Table 1**

**The Composition of the Index for Ranking the Quality of Corporate Governance in Israeli Firms**

| Serial no. | Variable symbol | Category within the Index | Variable definition and its presumed impact | Binomial coding |
|---|---|---|---|---|
| 1 | NUM_ MEET | Board of directors | No. of meetings of the board of directors called by the company. A higher no. of meetings improves corporate governance quality. | The variable takes the value of 1 if the company calls two or more meetings per year |
| 2 | CEO-_IS_ CHR | Board of directors | A dummy variable taking the value 1 if the company chairman is not the CEO, and 0 otherwise. When there is separation of roles at the top the quality of corporate governance improves. | The variable takes the value of 1 if the chairman is not the CEO. |
| 3 | BOARD_ SIZE | Board of directors | No. of members of board of directors. A larger board of directors detracts from the quality of supervision and corporate governance. | The variable takes the value of 1 for a board of between 6 and 9 members. |
| 4 | CONTROL_ DIR | Board of directors | The percentage of directors from among the controlling shareholders. The lower is this proportion of the higher is the quality of corporate governance. | The variable of the percentage of directors who are holders of a controlling interest takes the value 1 if there is no director who holds a controlling interest. |
| 5 | EMPLOY_ DIR | Board of directors | The percentage of directors who are employees of the company and are not controlling shareholders. The lower the proportion of company employees on the board of directors the better the quality of corporate governance. | The variable takes the value 1 if no member of the board of directors is a company employee. |
| 6 | EXPRT_ DIR | Board of directors | The percentage of directors with expertise in accounting and finance. The higher the proportion of experts on the board of directors the higher the quality of corporate governance. | The variable takes the value of 1 if 37 percent (the median) or more of the members of the board of directors are experts. |
| 7 | INT_ AUDIT_SUP | Audit and control | A dummy variable taking the value 1 if the organ in charge of the internal auditor is the audit committee, and 0 otherwise. The audit committee is (relatively) independent so that the quality of corporate governance improves. | The variable takes the value 1 if the organ in charge of the internal auditor is the audit committee. |
| 8 | INT_AUDIT_ YRS | Audit and control | The seniority of the internal auditor (the number of years he/she has been in that position). A high turnover attests to independence and hence better quality corporate governance. | The variable takes the value of 1 if the internal auditor has been in that position for 7 years (the median) or less. |
| 9 | AUDIT_ COM_EXT | Audit and control | The proportion of non-executive directors on the audit committee. A higher no. promotes independence and the quality of corporate governance. | The variable for the proportion of non-executive directors on the audit committee takes the value of 1 if this proportion is 75 percent or more. |

(Continue) **Table 1**

| Serial no. | Variable symbol | Category within the Index | Variable definition and its presumed impact | Binomial coding |
|---|---|---|---|---|
| 10 | AUDIT_ COM_EXP | Audit and control | The percentage of directors with expertise in accounting and finance on the audit committee. A high proportion of experts improves the quality of corporate governance. | The variable takes the value of 1 if 51 percent (the median) or more of the members of the committee are experts. |
| 11 | CONSULT_ AUDIT | Audit and control | The percentage of consultancy fees in the total fee paid to the company's external auditor. A low proportion attests to greater independence of the auditor and hence improved quality of corporate governance. | The variable for the proportion of consultancy fees in the fee paid to the company's external auditor takes the value 1 if this proportion is in below the median. |
| 12 | COMMUNITY | Ethics and fairness | A dummy variable which takes the value 1 if the company acts on behalf of the community (not by donating money), and 0 otherwise. Social responsibility is consistent with high quality corporate governance. | This variable takes the value 1 if the company works for the community via the volunteering activities of its employees on behalf of the community. |
| 13 | CONTROL_ DEAL | Ethics and fairness | The number of transactions with controlling shareholders that require the approval of the general assembly. A low no. of transactions attests to high quality corporate governance. | This variable takes the value of 1 if there are no transactions with holders of a controlling interest. |
| 14 | INTRSTED_ DEAL | Ethics and fairness | The no. of exceptional transactions with controlling shareholders that do not require the approval of the general assembly. A low no. of transactions attests to high quality corporate governance. | The variable takes the value of 1 if there are no such transactions. |
| 15 | MAALA | Ethics and fairness | A dummy variable coded as 1 if the company is included in the MAALA index of social responsibility, and 0 otherwise. Social responsibility is associated with high quality corporate governance. | This variable takes the value 1 if the company is included in the MAALA index for 2005. |
| 16 | ETHICAL_ CODE | Ethics and fairness | A dummy variable that takes the value 1 if the company has an ethical code, and 0 otherwise. Behaving according to an ethical code promotes high quality corporate governance. | This variable takes the value of 1 if the company has an ethical code. |
| 17 | EARLY REPORT | Transpare ncy | The number of days by which the company's annual report precedes the last date for publication set by law. Early publication increases transparency and improves the quality of corporate governance. | This variable takes the value of 1 if the company publishes its annual report at least 6 business days (the median) before the date set by the law. |
| 18 | PROXY | Transpare ncy | A dummy variable that takes the value of 1 if a company enables voting by proxy, and 0 otherwise. Increasing the company's accessibility to all shareholders improves the quality of corporate governance. | This variable takes the value 1 if the company enables voting by proxy. |
| 19 | CONF_ CALL | Transpare ncy | A dummy variable that takes the value of 1 if the company holds a conference call prior to the publication of its reports, and 0 otherwise. Greater transparency is consistent with high quality corporate governance. | This variable takes the value 1 if the company holds a conference call prior to the publication of its reports. |

The category "board of directors" in our index includes the following six variables:

NUM_MEET. The number of directors' meetings held by the company. A board of directors that meets several times a year is more active, has greater ability to monitor the controlling shareholders, and hence promotes better quality corporate governance. In 47 percent of the companies in our sample the board of directors met only once a year (and in some of those companies this appears to be insufficient).

BOARD_SIZE. The number of members on the board of directors. A board of directors that is too small or too large is ineffective, diminishing the quality of control and supervision that are essential for good corporate governance (Linck, Netter and Yang, 2008). In our sample, the median number of members of the board of directors is 8, and the inter-quartile range is 6 to 9. Thus, when we use a binomial dummy variable (0 or 1), a board of directors of a reasonable size (6 to 9 members) is coded as 1.

CEO_IS_CHR. A dummy variable taking the value of 1 if the company's CEO is not also its chairman, and 0 otherwise. When there is separation of authority at the top of the company there is mutual control and some balance of internal power, with an improvement in the quality of corporate governance (relative to a case where the CEO is also Chairman). Israel's Companies Law also regards undue concentration of power (a situation in which the CEO is also the chairman) unfavorably, permitting it only in special cases and for a limited period.

CONTROL_DIR. The proportion of directors who are also controlling shareholders. The lower is the proportion of controlling shareholders on a board of directors, the better are its independence and the quality of corporate governance.

EMPLOY_DIR. The proportion of members of the board of directors who are employees of the corporation but are not part of the control group. Directors who are employees of the corporation could be "influenced" by the controlling shareholders, hence, the lower is the proportion of employees who are on the board of directors, the better is the quality of corporate governance. The law also regards an unduly high proportion of internal directors (both holders of a controlling interest and employees of the company) unfavorably. According to Amendment no.8 of the Companies Law, in a public company with a controlling interest at least a third of the board of directors, including non-executive directors, should be independent; and in a public company without a controlling interest at least half the directors should be independent.

EXPRT_DIR. The proportion of directors with expertise in accounting and finance. The higher the proportion of experts on the board of directors, the better the quality of audit and control as well as of corporate governance.

The category "audit and control" in our index includes the following five variables:

INT_AUDIT_SUP. A dummy variable coded as 1 when the internal auditor is appointed and supervised by the audit committee, and 0 otherwise. The internal auditor is a company employee, and hence the body in charge of him/her is important. When the internal auditor reports to the audit committee his/her independence is greater, as is the quality of corporate governance.

INT_AUDIT_YRS. The seniority of the internal auditor (the number of years he/she has been in this position). An internal auditor who has held the position for too many years is suspect of experiencing 'fatigue' and of being too involved with the controlling

shareholders. A relatively fresh internal auditor is expected to be more vigorous and less bound by past conventions. Hence, a less veteran internal auditor (within the company) is expected to help improve the quality of corporate governance.

AUDIT_COM_EXT. The proportion of non-executive directors on the audit committee. A higher proportion of external directors increases independence and improves the quality of corporate governance.

AUDIT_COM_EXP. The proportion of non-executive directors with accounting and financial expertise on the audit committee. A higher proportion of expert directors improves the work of the committee, increases its independence and augments the quality of corporate governance.

CONSULT_AUDIT. The proportion of consultancy fees in the total fee paid to the company's external auditor. A lower proportion of consultancy fees in the total fee paid to the external auditor affords a higher level of independence on the part of the external auditor and contributes to the quality of corporate governance.

The category of "ethics and fairness" in our index includes the following five variables:

COMMUNITY. A dummy variable coded as 1 when the company is active on behalf of the community (not by means of a financial donation), and 0 otherwise. A company that encourages its employees to devote time to giving to the community is a more values-guided company that seeks to cultivate a culture of giving and fairness. Hence, it is reasonable to assume that its corporate governance will also be of a higher quality.

CONTROL_DEAL. The number of transactions with controlling shareholders that require the approval of the general assembly. Transactions with the company are suspect as a way to transfer wealth from the company to its controlling shareholder. Hence, a small number of transactions with controlling shareholders suggests a high quality of a company's corporate governance.

INTRSTED_DEAL. The number of transactions with controlling shareholders that do not require approval by the general assembly. As is the case with the preceding variable, a small number of transactions with controlling shareholders is consistent with a company with a relatively high quality of corporate governance.

MAALA. A dummy variable coded as 1 if the company is included in the MAALA index of corporate social responsibility, and 0 otherwise. The MAALA ranking includes those public companies that incorporate social responsibility into their business activity, and that also responded to the MAALA organization's questionnaire. Since only a few companies in Israel responded to that questionnaire, we regarded the response to it as an indication of excellence in the area of social responsibility. In our view, excellence in this area is associated with (and apparently attests to) excellence (in the relative sense) in the sphere of corporate governance.

ETHICAL CODE. A dummy variable that takes the value of 1 if the company has an ethical code, and 0 otherwise. The management's commitment to an ethical code reflects the honest spirit of the company, and suggests better corporate governance.

The category "transparency" in our index includes the following three variables:

EARLY_REPORT. The number of days by which a company's periodical report precedes the date set by law. Early publication of a report indicates that a company

cultivates transparency in its actions and reports to the public as quickly as possible. This concern for the public suggests a higher quality of corporate governance.

PROXY. A dummy variable coded as 1 if a company allows voting by proxy, and 0 otherwise. Voting by proxy improves corporate governance, as it makes vote accessible to all shareholders.

CONF_CALL. A dummy variable coded as 1 if a company holds a conference call prior to the publication of its reports, and 0 otherwise. The increased transparency vis-à-vis shareholders is consistent with a higher quality of corporate governance.

One of the main concerns regarding the variables included in the index is the fact that they overlap, so that at least some of them may be superfluous and may not contribute additional information. In order to examine this possibility, we calculated correlation coefficients between the 19 variables (a full correlation matrix can be obtained from the authors). We found a correlation of 0.49 between MAALA and COMMUNITY. Another three correlation coefficients (out of the 171 we calculated) were close to 0.3 and significant at the 1 percent level, while the rest were not significant. Consequently, we decided not to remove any variable from the index.

Our index for ranking the quality of corporate governance is based on two methods and is presented in four different versions. The first method is the binomial one, in which *each of the variables included in the index receives the value of 1 if it makes a positive contribution to the quality of corporate governance, and the value 0 otherwise*. In cases where the variable included in the index receives a wide range of values, the median is set as the cutoff for the binomial coding.

The index based on the binomial method is presented in two versions. The first gives the same weight to each of the 19 variables. In this version we add up the grades obtained for the various variables and divide them by 19.[2] We then multiply the result by 100. This index is called the 'General Binomial Index' (CGI_BIN_ALL). In the other version we divide the variables into the four categories presented above, giving each category equal weight. In this version we create a percentile grade within each category (add up all the variables, divide by the number of variables, and multiply by 100). We added up the grades in the categories and divided the result by 4 (i.e., the number of categories). We call this index the 'Group Binomial Index' (CGI_BIN_GRP).

Another way of constructing a CGI index includes all previous variables, but incorporates scalar data where possible. Six of the 19 variables included in the binomial index (MEET_NUM ,CONTROL_DIR ,EMPLOY_DIR ,EXPRT_DIR , CONSULT_AUDIT and EARLY_REPORT) may be ranked by quintiles and accordingly given values between 1 and 5. We divide their scalar value by 5, and the result replaces the binomial value of that variable.

[2] In companies with missing data (MISSING) we add up the variables for which valid data are available (VALID) and divide by the number of VALID variables. For 11 companies (out of the 141 in our main sample - companies that are traded solely on the Tel Aviv Stock Exchange), valid data was missing for one of the variables: for 4 companies we did not find who was in charge of the internal auditor, and for 7 we did not have data on the fees of the external auditor.

The index constructed using the scalar method also has two versions: The first, CGI_SCL_ALL, gives equal weight to each of the 19 variables in the index, and is calculated analogously to CGI_BIN_ALL. The second, CGI_SCL_GRP, divides the variables into four categories with equal weight, and is calculated similarly to CGI_BIN_GRP.

## 4. THE METHOD

### a. Factors affecting the level of the index of corporate governance quality

We examine which factors affect CGI, our index of corporate governance quality. The model we use is:

(1) CGI = F{ PUBLIC, INSTITUTE, NO_CONTROL, FAMILY, LEV, ASSETS, STDV, ROE, DIV }

The model is based on the variables in Black, Jang and Kim (2006b) or on variables that are similar to them in essence.

PUBLIC is the natural log of the number of years the public company has been listed. Assuming that the minimum quality of corporate governance required for listing on the exchange has risen over time (and assuming that veteran companies alter the quality of their corporate governance slowly over time), younger companies should demonstrate a higher quality of corporate governance than older ones.

NO CONTROL is a dummy variable that takes the value of 1 if a company has disperse ownership (no control group), and 0 otherwise. It is customary to assume that the consumption of private benefits will be more limited in disperse ownership firms.

FAMILY is a dummy variable that takes the value of 1 if the company is controlled by a family, and 0 otherwise. Control by a family affords higher private benefits consumption (Barak and Lauterbach, 2008), namely, weaker corporate governance.

LEV is the ratio of long-term debt to total assets (balance-sheet data). Companies with a high level of financial leverage are subject to tight supervision and control (e.g., by banks), and hence have a high quality of corporate governance.

ASSETS is the natural log of the company's total assets. We suggest that larger companies may be subject to greater oversight (e.g., by the authorities and the media), and hence must demonstrate a higher quality of corporate governance.

STDV is the daily standard deviation of the return on shares. We examine whether riskier companies adopt a better quality of corporate governance in order to ease the fears of their investors.

ROE is the return on equity. We examine whether more profitable companies have a better quality of corporate governance. An adequate corporate governance may require expensive resources, so that only more profitable companies can afford it.

We added two variables that we think could be influential. They are:

INSTITUTE. The proportion of vote held by institutional investors. Institutional investors monitor companies, and —at least in the US— force companies to adopt stricter corporate governance standards.

DIV. A dummy variable coded as 1 if the company pays dividends, and 0 otherwise. Companies that pay dividends display a positive attitude towards public shareholders, and may also adopt relatively high corporate governance standards.

**b. The relation between the value of a company and the quality of its corporate governance**

Most studies examine the relation between the index of corporate governance quality and the company's relative value, Tobin's Q. For the case of Israel, we examine the following model:

(2) Q = F{ CGI, PUBLIC, INSTITUTE, NO_CONTROL, FAMILY, LEV, ASSETS, FIX_TO_SLS, RND, STDV, ROE, DIV, INDUSTRY}

The explanatory variables in the model are inspired by previous studies, such as Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), McConnel and Servaes (1990), Lang and Stulz (1994), Yermack (1996), Daines (2001), La Porta et al. (2002), Gompers, Ishii and Metrick (2003), Bebchuk, Cohen and Ferrell (2009), Brown and Caylor (2006), Beiner, Drobetz, Schmid and Zimmermann (2006). Most of the variables were defined in equation (1) in the previous section, except for FIX_TO_SLS, the ratio between fixed assets and sales, and RND, a dummy variable that takes the value of 1 if the company reports its research and development expenses and 0 otherwise. A dummy variable, INDUSTRY, was also added. The purpose of this variable, used also in previous studies, was to neutralize the effect of the principal industry. This is done in order to reduce 'noise' and obtain more precise estimates of our main target - the relation between the quality of corporate governance (the CGI index) and the value of the company (Q).[3]

**c. The components of the index of the quality of corporate governance with the most effect on the value of a company**

Bebchuk, Cohen and Ferrell (2009) reduced the index constructed by Gompers, Ishii and Metrick (2003) by identifying and focusing on those components of the index that affect most strongly a company's value. Brown and Caylor (2006) also constructed an index for ranking the quality of corporate governance, subsequently singling out the components of the index with the strongest impact on Tobin's Q.

In their study Bebchuk, Cohen and Ferrell (2009) used the database of the Investor Responsibility Research Center (IRRC) that includes a set of 24 variables associated with

[3] We also tried to add the growth rate of net profits per share to the Q equation. However, in many cases the companies shifted from profit to loss, or vice versa, or reduced their loss, making it difficult to calculate the growth rate of profits. We therefore omitted this variable.

the quality of corporate governance in the US. Bebchuk et al. (2009) ran regressions of Tobin's Q equation on all the explanatory variables in their model, dividing the CGI index into two parts, the CGI index without the component examined, and the component they examined. This made it possible to examine the specific effect of each component of the CGI index. Using this method the authors managed to identify six components, out of the initial set of 24, that had a significant effect on the value of a company. Brown and Caylor (2006) use the method similar to Bebchuk et al. (2009) to signal out the key components of their 51 variable CGI index.

We chose to examine the components of the CGI index that had the strongest relation to company value in two ways. The first is identical in principle to that of Bebchuk et al. (2009), while the second differs from the first by omitting the explanatory variable 'CGI without the component examined' from the regressions. (Thus, in each regression we test the explanatory power of a different component of CGI.) In both methods, variables found to be significant in the individual regressions are added to and are jointly tested in a concluding summary regression.

## 5. THE SAMPLE

The initial sample in this study included the shares with the highest market value on the Tel Aviv Stock Exchange (TASE) at the end of 2005. The sample refers to the year 2005 because it was the most recent year for which up-to-date data were available when we began our research. At the end of the year 247 shares were included in the two indices (TASE 100 and YETER 150). However, we omitted the following:

1. 34 shares from the insurance and financial industries that are subject to more strict regulation than other firms.
2. 30 shares that were listed on the exchange after January 2004 (our analysis requires at least two years of prior data).
3. 3 shares of foreign companies that report differently than Israeli companies (i.e., data available for Israeli companies are not available for these firms).
4. 3 shares of oil and gas partnerships with partial accounting and trading data.
5. 2 shares of inactive holding companies.
6. 2 shares of companies that are partly government-owned.

This left 173 shares in the sample; 141 shares of Israeli companies traded solely on the TASE and 32 shares of Israeli companies traded both on TASE and NASDAQ or NYSE - dual shares.

The sample sources are diverse:

1. Financial data of the companies are collected from the annual reports found in the Super Analyst database.

2. Additional data needed in order to construct the index of corporate governance quality, such as holdings of controlling shareholders, the structure of the board of directors, etc., were collected from the MAYA website of TASE.

3. The standard deviation of daily returns of every share was collected from the Predicta database.

For a definition of the variables, see Table 2.

**Table 2**
**Definition of the Variables Included in the Statistical Analysis**

| Symbol of the variable | Variable name | Variable description |
|---|---|---|
| CGI_BIN_ALL | Overall binomial index | The index is calculated as the sum of its 19 binomial variables, divided by 19 and multiplied by 100.[a] |
| CGI_BIN_ GRP | Group binomial index | The variables were divided into four groups. A percentile grade was calculated *for each group*, as described above. The results were added up and divided by 4. |
| CGI_SCL_ ALL | Overall scalar index | In this index six variables are ranked on a scale and the rest are ranked binomially. Next, the index was calculated in the same way as the overall binomial index. |
| CGI_SCL_ GRP | Group scalar index | In this index six variables are ranked on a scale and the rest are ranked binomially. Next, the index was calculated in the same way as the group binomial index. |
| PUBLIC | Public company | The natural log of the number of years since the company listed on the exchange |
| INSTITUTE | Holdings of institutional investors | The percentage of holdings by institutional investors |
| NO_ CONTROL | No controlling shareholders | A dummy variable that takes the value of 1 if the company does not have controlling shareholders, and 0 otherwise. |
| FAMILY | Family firm | A dummy variable that takes the value of 1 if the company is controlled by a family, and 0 otherwise. |
| TOBIN'S Q | Company's relative value | The market value of equity + the book value of the debt divided by the book value of the company's assets. |
| LEV | Financial leverage | The ratio between long-term debt and total assets (balance-sheet data). |
| ASSETS | Company size | The natural log of the company's total assets (in thousand NIS). |
| FIX_TO_SLS | Fixed assets to sales | The ratio between the company's fixed assets and its sales. |
| RND | Research and development | A dummy variable that takes the value of 1 if a company reports its R&D expenses, and 0 otherwise. |
| STDV | Standard deviation | Daily standard deviation of the company stock return over 36 months ending at the end of 2005, but for not less than 24 months. |
| ROE | Return on equity | The ratio between net profits and total equity. |
| DIV | Payment of a dividend | A dummy variable that takes the value of 1 if a company distributes dividends, and 0 otherwise. |
| EMPLOY_ DIR | No employee directors | The percentage of directors who are company employees (and are not controlling shareholders) |
| INT_AUDIT_ YRS | Seniority of internal auditor | A dummy variable taking the value of 1 if the organ in charge of the internal auditor is the audit committee, and 0 otherwise. |
| CONTROL_ DEAL | Transactions with controlling shareholders | The number of transactions with controlling shareholders that require the approval of the general assembly. |
| ETHICAL_ CODE | Existence of an ethical code | A dummy variable taking the value of 1 if a company has an ethical code, and 0 otherwise. |
| EARLY_ REPORT | Early publication of firm's periodical reports | The number of business days by which the publication of the annual report precedes the date set by law. |

[a] If we could not find data for one of the variables (MISSING VALUE) in a given company, the formula uses for calculations only the variables for which the data exist (VALID), and adjusts the scale to a maximum of 100. Thus, for example, for CGI_BIN_ALL we add up all the VALID for a given company, multiply this by 100, and divide it by the no. of VALID.

In addition, in order to examine the consistency of our empirical results, we also collected financial data on the companies included in the sample as of end of 2007.

## 6. RESULTS

### a. Description of the main sample: shares traded only on the TASE

Because there are some major differences in some key parameters (e.g., the ranking of corporate governance and the Q ratio) between the sample of shares traded solely on the TASE and the sample of dual shares, we decided to separate these samples. In fact, our main empirical results are derived from the subsample of shares traded only on the TASE. The subsample of dual shares (32 companies) turned out to be too small to yield a comprehensive analysis with statistically significant results.

For a statistical description of the variables in the sample of shares traded only on the TASE, see Table 3. The sample contains 141 companies, 77 of which are jointly controlled by several individuals, 55 are family owned, and 9 do not have a control group.

**Table 3**
**Statistical Description of Variables in the Main Sample - Shares Traded Solely on TASE**

| Symbol of the variable | No. of observations | Mean | Median | Standard deviation | Min | Max |
|---|---|---|---|---|---|---|
| CGI_BIN_ALL | 141 | 34.01 | 33.33 | 9.13 | 10.53 | 63.16 |
| CGI_BIN_GRP | 141 | 31.16 | 31.67 | 9.09 | 8.33 | 60 |
| CGI_SCL_ALL | 141 | 41.11 | 41.05 | 8.31 | 22.10 | 68.42 |
| CGI_SCL_GRP | 141 | 37.89 | 37.83 | 7.95 | 20.17 | 63 |
| PUBLIC | 141 | 2.77 | 2.64 | 0.53 | 1.39 | 4.02 |
| INSTITUTE | 141 | 5.35% | 4.93% | 6.57 | 0 | 28.57 |
| NO_CONTROL [a] | 141 | 0.06 | 0 | 0.24 | 0 | 1 |
| FAMILY [a] | 141 | 0.39 | 0 | 0.49 | 0 | 1 |
| TOBIN'S Q [b] | 139 | 1.25 | 1.14 | 0.33 | 0.77 | 2.54 |
| LEV | 141 | 0.33 | 0.33 | 0.22 | 0 | 0.94 |
| ASSETS | 141 | 13.68 | 13.40 | 1.32 | 11.18 | 17.07 |
| FIX_TO_SLS [c] | 138 | 0.61 | 0.20 | 1.31 | 0 | 7.77 |
| RND | 141 | 0.21 | 0 | 0.41 | 0 | 1 |
| STDV | 141 | 2.44% | 2.34% | 0.63 | 1.38 | 4.46 |
| ROE [c] | 138 | 0.16 | 0.14 | 0.18 | -0.63 | 0.93 |
| DIV | 141 | 0.67 | 1 | 0.47 | 0 | 1 |

[a] The sample comprises 141 companies: 77 partnerships, 55 family firms, and 9 without a control group.
[b] outliers omitted.
[c] outliers omitted.

The sample comprises companies of different sizes. The average LN of total assets of 13.68 reflects average assets of NIS 873 million. The smallest company had assets of NIS 72 million, and the largest had assets of NIS 25.9 billion. 94 of the companies in the sample allocated a dividend and 29 reported R&D expenditure.

All four versions of our index of corporate governance quality display an almost normal distribution. In reviewing the results of the CGI indices it should be noted that the maximum possible value for each index is 100, so that at first glance the average CGI grade obtained (between 30 and 40) seems quite low. However, this impression is not necessarily correct. Note that many of the variables in our index take the value of 0 if the company is below the median of companies, so that the average grade expected in the sample is about 50. Furthermore, our CGI index has two components, PROXY and CONF_CALL (components 18 and 19 in Table 1), for which, in the period of the sample, all the companies traded solely on the TASE (our main working sample) took the minimum grade (i.e., 0). In fact, various international studies rank Israel close to the world's median with respect to the quality of corporate governance (e.g., La Porta et al., 2002, Table 2).

The relative value of the corporation, the Q ratio, obtained an average value of 1.25. The lowest value obtained was 0.77 and the highest was 2.54.

The average LN of the number of years as a public company was 2.77, which implies that on average our firms were traded on the TASE for 16 years. The lowest value reflects 4 years of trading as a public company, and the highest reflects 56 years of trading. Note that companies that were listed on the TASE after January 2004 were omitted from the sample because we required at least two years of listing on the exchange.

The average (median) of holdings by institutional investors was 5.35 percent (4.93 percent). Slightly more than half the companies in the sample had institutional investors. In those companies the holdings of institutional investors ranged from single figures to 28.6 percent.

In addition, on average, the companies provided a nice return on equity, 16 percent, financial leverage was 33 percent, the standard deviation of daily stock returns was 2.4 percent, and the ratio of fixed assets to sales was 0.61.

### b. Factors affecting the level of the index of corporate governance quality

Like Black, Jang and Kim (2006b), we examine possible factors that might affect our index of corporate governance quality. The regressions we ran are based on equation (1) in section 4.a., corrected for heteroskedasticity and multicolinearity.[4] The results of the regressions are presented in Table 4.

**Table 4**
**Factors Affecting the Level of the Index of Corporate Governance Quality**

The table reports results of OLS regressions, where the dependent variable is the index of corporate governance quality, in all four versions. The explanatory variables are defined in Table 2. The number of observations in the full and the parsimonious model is 138 (3 observations are missing). White and Durbin-Watson tests for heteroskedasticity and serial

[4] A high correlation (over 0.5) was found between the following explanatory variables: the standard deviation of the return on shares, company size, and financial leverage. Consequently, we first ran regressions of financial leverage and the stock standard deviation on company size, and then used the residual of these two regressions as explanatory variables in the CGI and Q regressions.

correlation respectively were run on the regressions, and adjustments were made for heteroskedasticity where necessary. The effect of the variable for company size was deducted from the variables for financial leverage and standard deviation in panel 1 (to reduce problems of multicolinearity). The coefficients are presented in the table with *p*-values beneath them. Values that are significant at the 5 percent level or higher are presented in bold characters.

**Table 4**
**Panel 1: The full model**

| Symbol of the variable | CGI_BIN_ALL | CGI_BIN_GRP | CGI_SCL_ALL | CGI_SCL_GRP |
|---|---|---|---|---|
| INTERCEPT | 46.17 | 44.34 | 47.89 | 45.40 |
| | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |
| PUBLIC | -1.41 | -0.91 | -1.23 | -0.77 |
| | 0.43 | 0.58 | 0.43 | 0.59 |
| INSTITUTE | -0.11 | -0.10 | -0.08 | -0.08 |
| | 0.42 | 0.45 | 0.59 | 0.58 |
| NO_CONTROL | 6.15 | 5.46 | 4.67 | 4.51 |
| | **0.02** | **0.03** | 0.07 | 0.06 |
| FAMILY | -1.21 | -2.18 | -1.22 | -1.52 |
| | 0.45 | 0.16 | 0.41 | 0.27 |
| LEV | 1.24 | -1.85 | -0.76 | -2.78 |
| | 0.82 | 0.74 | 0.88 | 0.56 |
| ASSETS | -0.71 | -0.88 | -0.31 | -0.46 |
| | 0.34 | 0.21 | 0.66 | 0.48 |
| STDV | -2.28 | -2.29 | -1.93 | -1.90 |
| | 0.12 | 0.09 | 0.16 | 0.13 |
| ROE | 10.68 | 12.77 | 10.58 | 10.82 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| DIV | 1.03 | 0.81 | -0.07 | 0.07 |
| | 0.55 | 0.62 | 0.96 | 0.96 |
| Adjusted R-squared | 0.07 | 0.12 | 0.06 | 0.09 |
| Reg. p-value | **0.02** | **0.01** | **0.05** | **0.01** |

**Table 4**
**Factors Affecting the Level of the Index of Corporate Governance Quality**
**Panel 2: The parsimonious model**

| Symbol of the variable | CGI_BIN_ALL | CGI_BIN_GRP | CGI_SCL_ALL | CGI_SCL_GRP |
|---|---|---|---|---|
| INTERCEPT | 32.14 | 28.95 | 39.27 | 35.95 |
| | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |
| NO_CONTROL | 6.62 | 6.69 | 5.62 | 5.70 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| ROE | 10.48 | 12.52 | 10.25 | 10.74 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| Adjusted R-squared | 0.07 | 0.09 | 0.07 | 0.08 |
| Reg. p-value | **0.01** | **0.01** | **0.01** | **0.01** |

The findings in panel 1 of Table 4 show that the coefficient of ROE is positive and significant at the 1 percent level, and that the coefficient of the dummy variable 'NO CONTROL GROUP' is positive and significant at the 5 percent level.

These results indicate that there is a possibility that companies without a control group and companies that display a higher return on equity adopt better quality of corporate governance. It appears easier for profitable companies to invest in good quality corporate governance, and companies without a control group naturally score higher on our index (because controlling shareholders do not exist), hence our empirical results appear reasonable.

The parsimonious model presented in panel 2 confirms the positive effect of profitability and the absence of a control group on the quality of corporate governance in Israeli companies.

On reflection, another question emerges: does the dummy variable 'NO CONTROL GROUP' really affect corporate governance quality, or is it the artificial result of the existence of a built-in bias in the CGI index? Note that our CGI index includes two components, 'the proportion of directors who are also controlling shareholders,' and 'the number of transactions with controlling shareholders that require the approval of the general assembly.' Both these variables are unique to companies with a control group. Companies without a control group automatically receive the maximum CGI score for these two variables. Hence, it could be argued that CGI is by definition biased in favor of companies without a control group.

In order to offset the effect of these two variables we omitted them from the index and repeated the statistical tests of Table 4. Our findings were similar. Even without the two variables that "discriminate" against companies with a control group we find that companies without a control group tend to adopt higher quality corporate governance.

Note, in conclusion, that our CGI index includes the two variables that discriminate against companies with controlling shareholders because transactions with controlholders make it possible for controlling shareholders to exploit small investors, thereby impairing the quality of the company's corporate governance. In our opinion, without these two components our CGI would be lacking.

### c. The relation of company's value to its quality of corporate governance

Most studies examine the relation between an index of corporate governance quality and company's relative value, Tobin's Q, by means of an OLS regression. The results of these regressions, adjusted for heteroskedasticity and multicolinearity,[5] are presented in Table 5.

[5] We calculated the correlation coefficients of the explanatory variables in the Q regression. We found significant correlations only between total assets, financial leverage, and the standard deviation of returns. The "treatment" of these correlations is identical to that described in the CGI regression - see footnote 3 above.

**Table 5**
**The Relation Between the Quality of Corporate Governance and Company Value**
The table presents the results of the regression where the dependent variable is the Q ratio, and the explanatory variables are defined in Table 2. The number of observations in the full model is 133 (8 observations are missing) and 136 (5 missing) in the parsimonious model. White and Durbin-Watson tests for heteroskedasticity and serial correlation respectively were run on the regressions, and adjustments were made for heteroskedasticity where necessary. The effect of the variable for company size was deducted from the variables for financial leverage and standard deviation in panel 1 (to reduce problems of multicolinearity). The coefficients are presented in the table with the *p*-values beneath them. Values which are significant at the 5 percent level or higher are presented in bold characters. In all the regressions we also used a dummy variable (fixed effect) for the firm's principal industry.

**Table 5**
**Panel 1: The full model**

| Variable symbol | Regression 1 | Regression 2 | Regression 3 | Regression 4 |
|---|---|---|---|---|
| INTERCEPT | 1.33 | 1.27 | 1.31 | 1.27 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| CGI_BIN_ALL | 0.00 | | | |
| | 0.08 | | | |
| CGI_BIN_GRP | | 0.01 | | |
| | | **0.03** | | |
| CGI_SCL_ALL | | | 0.01 | |
| | | | 0.07 | |
| CGI_SCL_GRP | | | | 0.01 |
| | | | | **0.04** |
| PUBLIC | -0.012 | -0.012 | -0.014 | -0.015 |
| | 0.76 | 0.75 | 0.72 | 0.70 |
| INSTITUTE | -0.0077 | -0.0078 | -0.0076 | -0.0077 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| NO_CONTROL | 0.27 | 0.27 | 0.27 | 0.27 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| FAMILY | 0.14 | 0.14 | 0.14 | 0.14 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| LEV | -0.29 | -0.26 | -0.29 | -0.27 |
| | 0.10 | 0.14 | 0.10 | 0.13 |
| ASSETS | -0.030 | -0.028 | -0.032 | -0.031 |
| | 0.17 | 0.20 | 0.14 | 0.15 |
| FIX_TO_SLS | 0.03 | 0.02 | 0.02 | 0.02 |
| | 0.10 | 0.15 | 0.10 | 0.11 |
| RND | 0.04 | 0.03 | 0.04 | 0.03 |
| | 0.55 | 0.61 | 0.56 | 0.59 |
| STDV | -0.094 | -0.090 | -0.094 | -0.092 |
| | **0.05** | **0.05** | **0.04** | **0.05** |
| ROE | 0.37 | 0.35 | 0.37 | 0.36 |
| | 0.06 | 0.08 | 0.06 | 0.06 |
| DIV | 0.09 | 0.09 | 0.10 | 0.10 |
| | 0.07 | 0.07 | 0.06 | 0.06 |
| Adjusted R-squared | 0.31 | 0.32 | 0.31 | 0.31 |
| Reg. p-value | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |

**Table 5**
**The Relation Between the Quality of Corporate Governance and Company Value**
**Panel 2: The parsimonious model with variables significant at the 10 percent level**

| Symbol of the variable | Regression 1 | Regression 2 | Regression 3 | Regression 4 |
|---|---|---|---|---|
| INTERCEPT | 1.08 | 1.03 | 1.03 | 0.98 |
| | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |
| CGI_BIN_ALL | 0.01 | | | |
| | **0.03** | | | |
| CGI_BIN_GRP | | 0.01 | | |
| | | **0.01** | | |
| CGI_SCL_ALL | | | 0.01 | |
| | | | **0.03** | |
| CGI_SCL_GRP | | | | 0.01 |
| | | | | **0.01** |
| INSTITUTE | -0.0076 | -0.0077 | -0.0075 | -0.0075 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| NO_CONTROL | 0.28 | 0.28 | 0.28 | 0.28 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| FAMILY | 0.13 | 0.14 | 0.13 | 0.13 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| STDV | -0.082 | -0.077 | -0.080 | -0.077 |
| | 0.07 | 0.08 | 0.07 | 0.09 |
| ROE | 0.39 | 0.36 | 0.39 | 0.37 |
| | **0.04** | 0.07 | **0.04** | 0.06 |
| DIV | 0.09 | 0.09 | 0.10 | 0.10 |
| | 0.07 | 0.07 | 0.06 | 0.06 |
| Adjusted R-squared | 0.31 | 0.32 | 0.31 | 0.31 |
| Reg. p-value | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |

**Table 5**
**The Relation Between the Quality of Corporate Governance and Company Value**
**Panel 3: The parsimonious model with variables significant at the 5 percent level**

| Symbol of the variable | Regression 1 | Regression 2 | Regression 3 | Regression 4 |
|---|---|---|---|---|
| INTERCEPT | 0.89 | 0.84 | 0.83 | 0.79 |
| | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |
| CGI_BIN_ALL | 0.01 | | | |
| | **0.01** | | | |
| CGI_BIN_GRP | | 0.01 | | |
| | | **0.01** | | |
| CGI_SCL_ALL | | | 0.01 | |
| | | | **0.01** | |
| CGI_SCL_GRP | | | | 0.01 |
| | | | | **0.01** |
| INSTITUTE | -0.0060 | -0.0061 | -0.0058 | -0.0059 |
| | **0.05** | **0.04** | 0.06 | **0.05** |
| NO_CONTROL | 0.28 | 0.28 | 0.28 | 0.28 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| FAMILY | 0.10 | 0.11 | 0.10 | 0.11 |
| | **0.03** | **0.01** | **0.03** | **0.02** |
| ROE | 0.42 | 0.38 | 0.42 | 0.40 |
| | **0.04** | 0.06 | **0.04** | **0.05** |
| Adjusted R-squared | 0.27 | 0.29 | 0.27 | 0.28 |
| Reg. p-value | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |

**Table 5**
**The Relation Between the Quality of Corporate Governance and Company Value**
**Panel 4: The parsimonious model where the dependent variable is Q in 2007**

| Symbol of the variable | Regression 1 | Regression 2 | Regression 3 | Regression 4 |
|---|---|---|---|---|
| INTERCEPT | 1.11 | 1.09 | 0.93 | 0.90 |
| | **<0.0001** | **<0.0001** | **<0.0001** | **<0.0001** |
| CGI_BIN_ALL 2005 | 0.01 | | | |
| | **0.03** | | | |
| CGI_BIN_GRP 2005 | | 0.01 | | |
| | | **0.01** | | |
| CGI_SCL_ALL 2005 | | | 0.01 | |
| | | | **0.01** | |
| CGI_SCL_GRP 2005 | | | | 0.01 |
| | | | | **0.01** |
| INSTITUTE 2007 | -0.0098 | -0.0096 | -0.0097 | -0.0096 |
| | **0.04** | **0.05** | **0.05** | **0.05** |
| NO_CONTROL 2007 | 0.23 | 0.23 | 0.20 | 0.20 |
| | **0.01** | **0.01** | **0.03** | **0.03** |
| FAMILY 2007 | 0.28 | 0.29 | 0.26 | 0.28 |
| | **0.01** | **0.01** | **0.01** | **0.01** |
| ROE 2007 | 0.03 | 0.03 | 0.03 | 0.03 |
| | 0.73 | 0.78 | 0.75 | 0.78 |
| Adjusted R-squared | 0.17 | 0.18 | 0.18 | 0.19 |
| Reg. p-value | **0.0008** | **0.0006** | **0.0005** | **0.0004** |

We focus, first, on the effect of the quality of corporate governance. At the first stage, in panel 1, we obtain a positive coefficient of the CGI that is significant at the 10 percent level. At the next stages, panels 2 and 3, we reduce the number of explanatory variables in the regression and find that the coefficient of the CGI is positive and significant at the 1 percent level. The clear conclusion is that in Israel too, there is a significant positive relation between a company's value and the quality of its corporate governance. This conclusion supports our main research hypothesis.

With regard to the other explanatory variables, the proportion of holdings of institutional investors was significantly negative. This would appear to indicate that holdings by institutional investors decrease company value. In fact, however, in this case at least, causality might be reversed - institutional investors might have larger holdings in companies with a low Q ratio, known as 'value companies.' Our findings are consistent with those of Beiner, Drobetz, Schmid and Zimmermann (2006), who found a insignificant negative coefficient for the holdings of institutional investors. They argue that institutional investors monitoring does not increase company value.

The variable 'NO CONTROL GROUP' appears with a significant positive coefficient in all the regressions. This means that companies without a control group have higher market values. This may be due to the quality of corporate governance, i.e., in a company without a

control group fewer private benefits are consumed relative to an identical company with a control group.[6]

The 'family control' variable also appears with a significant positive coefficient. In our opinion, the causal relationship is apparently the reverse, i.e., companies with a high Q ratio are controlled by a family or an individual who refuse to sell part of the control to a business partner or to the public. Similar findings and conclusions also appear in international studies, for example in Barontini and Caprio (2006) and Andres (2008).

Note, that the benchmark in the regression in Table 5 is a control structure with several business partners. Thus, the precise interpretation of the positive coefficients of 'NO CONTROL GROUP' and 'FAMILY CONTROL' is that these control structures have a significantly higher Q than companies controlled by several business partners.

Accounting profitability, ROE, was found to have a positive effect on firm's relative value, Q. This result is natural, as more profitable companies have a higher valuation.

Finally, other variables that were found to have some influence, at the 10 percent significance level, were the standard deviation of the return on shares and the distribution of dividends. Companies with a higher standard deviation had a lower Q, possibly because the market demands that they provide a higher return, which decreases their market valuation. Companies that pay dividends have a higher market value, perhaps because the risk of investing in these companies is lower, or because the payment of a dividend reflects a more positive attitude to small investors on the part of controlling shareholders.

Before concluding the discussion of the results of Table 5, we must point out that there is a serious problem when it comes to drawing conclusions about our main result – the positive relation between company value (Q) and its corporate governance index (CGI). A cause and effect relationship is a direct relationship which means that the existence of one factor is causing the outcome of another one. In many instances, there is a statistical relationship between two factors but there is no cause and effect relationship.

Three conditions are required for the existence of a cause and effect relationship:

1. The existence of a statistical relationship: Previous research, as well as ours, has documented a positive relationship between the value of the corporation (Q) and the quality of its corporate governance (CGI). This has been shown to be consistent over the entire period examined.

2. There is a logical timeline for the appearance of the factors. In other words, the cause factor must exist before the effect factor.

3. There are no other explanations for the existence of the effect factor. This is an important condition and is the most difficult one to prove.

In the regressions we ran the causal direction is not clear, i.e., it cannot be concluded that better quality corporate governance has a positive effect on company value. To some extent at least the causal relation may go the opposite way, namely, a higher company valuation facilitates better quality corporate governance. In sum, the precise conclusion of our research is that there is some basis for the argument that better quality corporate

[6] When we repeated the regressions using the CGI index that excludes the components that are unique to companies with a control group, we still found that companies without a control group have greater market value.

governance contributes to company value. The exact same conclusion is also drawn by previous international studies.

Regarding causality, we found that there is a clear statistical relationship between Q and CGI, as the first condition above requires. Now, we aim to test the second condition - a clear and logical timeline. We collected financial data for the year 2007 for all the companies in the sample and re-run the parsimonious regressions of Table 5c. To be more precise, in the new regression, we use 2007 data for Q, INSTITUTE, NO_CONTROL, FAMILY, and ROE, and 2005 data for CGI (i.e., it remained at its previous level, which was correct for 2005). The results of the estimation are presented in panel 4 of Table 5. The relation between the company's relative value (Q) and CGI remained positive and significant, even though the CGI was not updated and was based on calculations from two years earlier. In our view, this reinforces our impression of a positive (and possibly even causal) relation between the quality of corporate governance and company value.

Last, we test the third condition above using the Three-Stage-Least-Squares (3SLS) methodology. The advantage of using the 3SLS method is that it accounts for the endogeneity of the explanatory variables, which can reveal some information about a cause and effect relationship. The drawback of this method is its large sensitivity - the information it provides is sensitive to the formulation of the estimated equations.

The simultaneous model we examine using the 3SLS method is a combination of the two parsimonious models that we estimated previously[7]:

$$CGI = F\{Q,\ NO_CONTROL,\ ROE,\ STDV\}\ Q = F\{CGI,\ INSTITUTE,\ NO_CONTROL,\ FAMILY,\ ROE\}$$

The fitted simultaneous 3SLS model yields a positive yet statistically insignificant coefficient of CGI in the Q regression, and a negative yet statistically insignificant coefficient of Q in the CGI regression. Thus, while it appears that corporate governance has a positive effect on the value of the corporation, we cannot completely rule out an opposite causality, i.e., the possibility that high value corporations adopt higher quality corporate governance practices.

### d. The components of the corporate governance index that significantly impact company value

We used two methods to examine which of the components of our CGI has a significant effect on company value. The first method is consistent with that of Bebchuk et al. (2009) reviewed in section 4.c. above, and combines it with the parsimonious regression in panel 2 of Table 5.

[7] In fact, we had to add the SDTV variable to the CGI equation. It is not included in the parsimonious model we reported earlier. The reason for this is that the original system of equations is miss-specified and so in order to get to a solution we must add an additional variable. We chose to use STDV as it is the most significant variable in panel A of table 4.

(3) Q = F{ (CGI-excluding one parameter), CGI_PARAMETER INSTITUTE, NO_CONTROL, FAMILY, STDV, ROE, DIV }

In principle we should have run 19 regressions (equal to the number of components in the CGI index). However, we are unable to examine two components, PROXY and CONF_CALL, because all the shares in our main sample (those traded solely on the TASE) obtained the minimum grade (0) on these components. In the 17 regressions we ran (each regression examines a difference component of the CGI) we identified three components that had a significant effect on company value: the existence of an ethical code, early reporting of business results, and the proportion of company employees on the board of directors. In accordance with the method devised by Bebchuk et al. (2009), we included those variables in the following Q regression:

(4) Q = F{ EMPLOY_DIR, ETHICAL_CODE, EARLY_REPORT, INSTITUTE, NO_CONTROL, FAMILY, STDV, ROE, DIV }

where

EMPLOY_DIR is the proportion of directors who are employees of the company. Directors who are organs of the company lose their ability to control and audit, and could be maneuvered by controlling shareholders.

ETHICAL_CODE is a dummy variable coded as 1 if the company has an ethical code, and 0 otherwise. The existence and implementation of an ethical code in a company means that the management and shareholders have a commitment to the employees, customers, lenders, suppliers, and investors. In effect, a company that commits to an ethical code also progresses towards good quality corporate governance.

EARLY_REPORT is the number of business days by which the publication of a company's annual report precedes the last reporting date set by law. A company that publishes its annual report before the final date set by law gains greater media coverage. Firms publishing their results on the last date set by law avoid much scrutiny, because their reports 'drown' in a sea of other reports.

The results of the regression in equation (4) indicate that the coefficients of STDV and ROE are insignificant. Hence, we omitted them from the parsimonious version of the model. The results of the parsimonious regression of the Bebchuk et al. (2009) methodology are reported in Table 6. Again, we obtained three components of corporate governance that have a significant positive correlation with a company's relative value, Q: the existence of an ethical code, early publication of periodical reports, and the inclusion of few company employees on the company's board of directors.

**Table 6**
**The Components of the Index of Corporate Governance Quality that are Most Closely Associated with Company Value**

The table presents the results of the regression where the dependent variable is the Q ratio, and the explanatory variables are defined in Table 2. The number of observations in the models is 136 (5 observations are missing). White and Durbin-Watson tests for heteroskedasticity and serial correlation respectively were run on the regressions, and

adjustments were made for heteroskedasticity where necessary. In all the regressions we also used a dummy variable (fixed effect) for the firm's principal industry. The coefficients are presented in the table with the *p*-values beneath them. Values that are significant at the 5 percent level or higher are presented in bold characters.

| Symbol of the variable | The full model | The parsimonious model – Bebchuck et al. (2009) methodology | The final Parsimonious model |
|---|---|---|---|
| INTERCEPT | 1.05 | 0.95 | 0.92 |
| | **<0.0001** | **<0.0001** | **<0.0001** |
| EMPLOY_DIR | 0.28 | 0.29 | 0.29 |
| | **0.05** | **0.03** | **0.04** |
| CONTROL_DEAL | 0.09 | | 0.11 |
| | 0.09 | | **0.04** |
| ETHICAL_CODE | 0.29 | 0.35 | 0.34 |
| | **0.01** | **0.01** | **0.01** |
| INT_AUDIT_YRS | -0.0054 | | |
| | 0.37 | | |
| EARLY_REPORT | 0.01 | 0.01 | 0.01 |
| | **0.01** | **0.01** | **0.01** |
| INSTITUTE | -0.0078 | -0.0076 | -0.0082 |
| | **0.01** | **0.01** | **0.01** |
| NO_CONTROL | 0.26 | 0.29 | 0.29 |
| | **0.01** | **0.01** | **0.01** |
| FAMILY | 0.14 | 0.14 | 0.15 |
| | **0.01** | **0.01** | **0.01** |
| STDV | -0.037 | | |
| | 0.39 | | |
| ROE | 0.23 | | |
| | 0.18 | | |
| DIV | 0.11 | 0.11 | 0.12 |
| | **0.03** | **0.01** | **0.01** |
| Adjusted R-squared | 0.40 | 0.39 | 0.41 |
| Reg. p-value | **<0.0001** | **<0.0001** | **<0.0001** |

The second methodology we employ is also based on the parsimonious regression in panel 2 of Table 5. We omit the CGI index from this parsimonious regression and include the variable CGI_PARAMETER instead. This variable is one of the single components in our CGI index.

(5) Q = F{ CGI_PARAMETER, INSTITUTE, NO_CONTROL, FAMILY, STDV, ROE, DIV }

We ran the regression in equation (5) 17 times, each time using a different component of the CGI index. We found five components that have a significant effect on company value, and included them in the following Q regression:

(6) Q = F{ EMPLOY_DIR, CONTROL_DEAL, ETHICAL_CODE, INT_AUDIT_YRS, EARLY_REPORT, INSTITUTE, NO_CONTROL, FAMILY, STDV, ROE, DIV }

where EMPLOY_DIR, ETHICAL_CODE and EARLY_REPORT are the components identified as having the strongest relation with company value by the Bebchuk et al. (2009) methodology – see above.

The two new variables of the second methodology were:

1. CONTROL_DEAL, the number of transactions with the controlling shareholders that require the approval of the general assembly. Such transactions include management remuneration, indemnity and insurance, and transactions with other companies (sometimes private) of the controlling shareholders. A low number of transactions of this kind attests to a high quality of corporate governance.

2. INT_AUDIT_YRS, the number of years the internal auditor has been in his/her position in the company. A high turnover attests to the independence of the auditor and a better quality of corporate governance.

The results of estimating equation (6) are shown in Table 6. In the general regression the variables INT_AUDIT_YRS, STDV and ROE are insignificant, and we therefore omitted them from the parsimonious regression. In the parsimonious regression we obtained four components of corporate governance with a significant positive correlation with the company's relative value, Q: the existence of an ethical code, few transactions with controlling shareholders, early publication of periodical reports, and the inclusion of a small number of employee directors on the board of directors.

In conclusion, both methods of identifying the 'important' components of CGI yield almost identical results. The sole difference between them is the number of transactions with controlling shareholders requiring the approval of the general assembly that, according to the results in Table 6, appears to have a significant positive correlation with company value.

### f. Does dual listing improve the quality of a company's corporate governance and increase its value?

In order to examine the effect of dual listing on the quality of corporate governance and company value we used a *t* test to compare shares listed for trading only on the TASE and those listed also on the NASDAQ or the NYSE. Note that dually listed firms report in accordance with US law, using the F-20 procedure.

A comparison of the indices constructed using the binomial method, documents higher average index values for the dual shares at the 6 percent significance level at least. The average scalar indices, CGI_SCL_GRP and CGI_SCL_ALL, were higher for the dual shares at the 1 percent significance level.

In order to refine the findings of the test we repeated the analysis omitting the variables in the CGI index that are unique to the dual shares. Two of the variables in our CGI index, PROXY and CONF_CALL, obtained a positive value only for dual shares. (Shares traded only on the TASE were graded 0 for these variables). Thus, the dual companies inevitably obtained a higher CGI grade. A comparison of the indices without those two variables does not change the conclusions. In all four versions of the CGI index, the average CGI score is higher for the dual shares, at a significance level of 3 percent at least.

In comparisons of company's relative value, Q, we found that dual companies had a higher average Q (1.50) than companies traded solely on the TASE (1.19). The difference in averages is significant at the 1 percent level.

Finally, we calculated the correlation between Q and CGI for the sample of 32 dual shares. We found that the correlation between Q and the CGI_BIN_ALL index is 0.31 (*p-value* + 0.09). The other CGI indices were also positively correlated with Q, yet these correlation coefficients are insignificant.

The findings above support our hypothesis that dual listing in a country with high corporate governance standards improves a company's corporate governance and increases company's market valuation. However, because of the small sample of dual companies, we refrain from clear-cut conclusions on this subject.

## 7. SUMMARY AND CONCLUSIONS

In this study we constructed, for the first time in Israel, an index of the quality of corporate governance based on some technical principles suggested by previous research conducted abroad. The Israeli index constructed by us (in four alternative versions) comprises of 19 variables in four separate categories: the abilities of the board of directors, auditing and control, ethics and fairness, and transparency.

At the first stage we examined factors that are possibly correlated with the quality of corporate governance (i.e., with the level of our CGI index). The results indicate that companies without a control group and companies that have a higher return on equity manifest better quality corporate governance.

At the second stage we examined whether there is a correlation between the value of a company and the quality of its corporate governance. We found that there is a significant positive correlation between indices of the quality of corporate governance and a company's relative value (Tobin's Q). Our conclusion is that there is a basis for arguing that the quality of corporate governance has a positive effect on company value. Note, however, that causality has not been proven. That is, at least part of the positive relation between company value and the quality of its corporate governance might stem from the fact that a better economic situation (a high Q value) enables a company to adopt higher quality corporate governance. Researchers all over the world have tried to develop reliable methods for identifying causality in our context, but no-one has yet come up with a convincing solution. We found a significant positive correlation between a firm's relative value at the end of 2007 and the index of its corporate governance in 2005, slightly reinforcing the impression that a high quality of corporate governance increases a company's market value. However, in a simultaneous equation framework, we only document a statistically insignificant positive impact of CGI on Q. Thus, by no means, can we claim that we have resolved the causality issue.

At the third stage we examined which of the components of the CGI index significantly impact a company's value. We found four components that have a significant positive correlation with a company's relative value, Q: the existence of an ethical code, few transactions with controlling shareholders, early publication of periodical reports, and few

employee directors on the board of directors. These four components highlight the transparency, organizational ethics, and independence of the board of directors as important ingredients of high quality corporate governance.

Finally, we examined the effect of dual listing on the quality of corporate governance and company value. Companies listed for trading on both the TASE and another country with high standards of corporate governance (such as the US) were found to have a higher quality of corporate governance and a higher Q value.

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