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Contestability and pay differential in the executive suites

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Abstract

In comparison to the abundant evidence on CEOs' compensations, little is known about the compensation of other senior executives, and on how the pay differential between CEO and other senior executives affects firm performance. We examine several potential explanations of the pay differential in the executive suite, using a sample of 367 *Israeli firms listed on the Tel-Aviv Stock Exchange. The empirical results fail to support the tournament and pay equity models. Instead, our evidence suggests a model where senior executives are encouraged (by the structure implied in their pay contract) to cooperate with each other (the team playing model). In a subset of firms managed by their owners we observe greater pay differentials between the owner-CEO and other senior executives. Interestingly, only in this subset of owner-managed firms, higher pay differentials can be associated with better firm performance.*

Keywords: *executive compensation, organisational structure, tournaments.*

JEL classification: *G*32, *J*31, *L*2.

1. Introduction

In recent years, there has been a considerable amount of research on the compensations of top executives (Jensen and Murphy, 1990; Kaplan, 1994a, 1994b). The importance of this line of inquiry is well justified as incremental shareholders' wealth may be created from an optimal compensation design. However, the research emphasis so far is on designing the package of compensations for the top executives only. A neglected issue is the design of pay for other members of the top management team *vis-à-vis* the CEO, or the optimal pay

differential between the CEO and other senior executives. This is the top executives' pay structure issue.

There are many reasons why a study of top executives pay structure may be of interest:

(i) studying the pay of senior executives is a natural extension of the CEO compensation studies,
(ii) senior executives, other than CEOs, may, in the aggregate, contribute to a firm's success as much if not more than the CEOs,
(iii) an ill-conceived pay structure may have undesirable value reducing consequences, e.g. diverting senior executives' time to engage in office politics, or losing the best CEO candidates to other firms, and
(iv) there is a need to verify certain potential theoretical explanations for top executives pay structures, as well as developing some new explanations.

We investigate empirically several theories that may explain top executives pay structure. The research methodology of this study is unique in two ways. First, we utilise a large sample of firms that represent a wide range of organisational and ownership structures. The availability of several distinct firm types enables us to formulate a more refined procedure to test pay structure theories. Our research approach makes use of the idea that the most suitable test of a particular pay structure model should be conducted on a sample of firms operating under an organisational structure where the theory is most applicable. For instance, the ideal environment for testing the tournament model is a sample of firms in which the CEO position is contestable, i.e. the senior executives may consider themselves as potential successors or contestants. On the other hand, to the 'outsider' senior executives in family owned firms where family members are also the CEOs, the contestability of the CEO position may be moot, i.e. no tournament is to be expected.

The second unique feature of the research design is that we conduct two related tests: (i) whether the implied compensation contracts obtained from empirical estimations contain features predicted by a certain pay structure model (this is the test based on compensation contract design), and (ii) whether a particular pay structure model produces the desired results on performance (this is the effectiveness issue).

This study utilises a sample of Israeli firms that are listed in the Tel Aviv Stock Exchange. This sample is desirable because:

(1) Contrary to the US corporations, a large proportion of Israeli firms is owned and controlled directly or indirectly by a family or a partnership of individuals.[1] Firms that are owned by families and individuals belong to an important class of ownership structure that has not been studied or understood, although it is probably the most dominant organisational form in the rest of the world.

[1] There are only a handful study of US majority owned firms, e.g., Jarrell and Paulsen (1988), DeAngelo and DeAngelo (1985), and Dennis and Dennis (1994). The samples are small (45 firms in DeAngelo and DeAngelo, 72 firms in Dennis and Dennis, and 89 firms (some are not over 50% owned) in Jarrell and Paulsen (1988).

(2) Detailed information on ownership structure and pay structure is available.

The paper is organised as follows. Section 2 presents different theories of top executive pay structures. Their testable hypotheses are listed in section 3. Section 4 describes the data. Section 5 presents and analyses the empirical results. Conclusions are given in section 6.

2. Theories on executive pay structure

The traditional labour economics theory would attribute differences in pay between individuals in an organisation to differences in their marginal products. Those who make greater contributions should receive greater pay. This concept is applicable to all employees in an organisation; executives are supposed to be compensated in the same way. There is no other consideration in determining executives' pay. The design of pay structure for the senior executives is not an issue. Consequently, if a CEO receives 200% more compensation than those top executives immediately below him, and 20 times the pay of an average worker in the firm, it is to be justified on the basis of his or her marginal contributions. CEOs are argued to have greater impact on firms' value due to the quality and importance of the decisions they made.

This view has been questioned because there appears to be little difference between the ability of the CEOs and the other top executives; witness the ease most firms can replace departing or retiring CEOs by other senior executives. Thus, in recent years several competing models of pay structure have been developed. These models highlight the effect of pay structure on the efforts and performance of the senior executives. There is a shift in the paradigm on executive pay structures from absolute worth to promoting incentive and selection.

In the following, we review four competing views of executive pay structures. These are tournament model, the pay equity models and the team player model for contestable firms, and the reward to entrepreneurship for non-contestable firms managed by owners. The strengths and shortcomings of these models are assessed.

2.1. *The tournament theory*

The tournament model (Lazear and Rosen, 1981) advances the idea that pay gap between workers (players) in one rank and the next higher rank would be large and greater than their marginal products, thus, providing the incentives for the contestants to do their best. The pay gap is the prize of the tournament, which is expected to increase the higher the level of the tournament (Rosen, 1986).

When applied to the pay difference between the CEOs and their senior executives, the tournament model will predict large pay gap in firms where the model is applicable. The model suggests that large pay differential will motivate all senior executives, who consider themselves as potential candidates for the CEO position, to exert maximum effort. There are other benefits of the tournament model. (1) The owners or the Board of Directors will be forced, in choosing tournament winners, to make distinction between senior executives (Malcomson, 1984). (2) The costs of monitoring performances are reduced as it

is easier to judge executives based on ordinal ranking than quantitative worth (Rees, 1992). (3) When the common macro or market shocks affecting the performances of all executives are large, the tournament would be a more effective device to identify superior executives (Green and Stokey, 1983; Nalebuff and Stiglitz, 1983). (4) When the executives cannot authenticate the board's observation of their performance due to asymmetric information, the commitment by the board to a tournament pay structure reduces possible conflicts because the board has agreed *ex ante* to pay out the agreed upon 'prize' to the winner, regardless of the board's own rating of the winner's performance. It leads to an enforceable contract (Green and Stokey, 1983), and reduces the board's ability to cheat on evaluation (Malcomson, 1984).

The tournament model, however, is criticised by later researchers. When applied to top executive compensation design, it has shortcomings (see the review by Dye, 1984; and McLaughlin, 1988). (1) It is difficult to motivate the losers, and the effect could be demoralising. (2) Even ranking executives could be difficult if their performances are multidimensional. (3) Promotion may not be the appropriate incentive device because there may not be a matching of the skills in one job and the next promoted job, or the Peter's principle applies (see Baker, Jensen and Murphy, 1988). (4) Most serious of all is the problem of collusion and sabotage by the contenders. It encourages non-cooperative behaviours, such as overinvestment in self promotion through office politics by the executives (Milgrom and Roberts, 1988), or even destructive behaviour including sabotage of rivals (Lazear, 1989).

Empirical tests of the tournament pay model using all firms could bias against the model as the framework may not be applicable to many firms in which the chance of other executives to succeed the CEO is nil or none. We provide a refinement to test the tournament model by making explicit recognition of the likelihood that the next CEO may be chosen among the ranks of the other top executives. In other words, we consider the question of contestability of the CEO position in interpreting the empirical result. The more contestable the CEO position is, the more likely the prediction of the tournament model should hold, i.e. the larger the pay gap between the CEO and the other executives. Thus the testable hypotheses of the tournament theory are:

> when there is high (low) likelihood that a firm's CEO position is contestable the absolute pay difference between the CEO and the other senior executives will be high (low)(H1).

This version of tournament model, based on absolute pay difference, is basically a static one. To account for the real world dynamics that CEOs are not replaced at the end of a single period, and they do serve with the other executive over many periods, we extend the model, and postulate that period to period changes in pay conditional on performance (beyond the CEOs' marginal products) of CEOs are also higher (H2). This may appear at first glance a stronger version of the tournament model. Upon closer examination it is easy to show that (H2) is a necessary condition for (H1) to hold in the multiperiod periods. Otherwise, absolute pay differential (H1) may diminish over time in monetary or relative terms.

An alternate strategy to test the tournament model is to examine *ex post* results. If the tournament pay structure gives the optimal compensation contract

for firms with contestable CEO position, then among contestable firms, those that have chosen the tournament pay structure, i.e. greater pay differential, will perform better than those that do not. Thus, pay differential between the CEOs and other top executive may explain differences in subsequent performances (H3).

2.2. *The pay equity theory*

To eliminate the shareholders wealth-reducing consequences of noncooperative and destructive behaviours caused by the tournament pay structure, Lazear (1989) suggests a theory of wage compression. That is, wage differences between ranks will be small to reduce excessive competition. The idea of pay equity, however, can be traced to earlier writings. For instance, individuals are known to make comparisons of rewards, and are usually conscious of wage differences in groups or teams that are highly interdependent. Lesser wage dispersion is associated with higher satisfaction which may lead to greater productivity as well (Festinger, 1954; Tversky and Kahneman, 1973). Drago and Turnbull (1988, 1991) stress the importance of cooperation among the executives/workers and the positive externality that can be realised from cooperative behaviour. Garvey and Swan (1992) also find flatter pay structure to be more desirable.[2]

The predictions of the pay equality model are: regardless of the nature of CEO succession, ownership structure, or organisational structure of the firm, the pay difference among the top executives is small or even none (H4). Consequently, the difference in the period to period change in pay conditional on performance is also small or none. Or else, pay equality may not be maintained over time (H5). Finally, if pay equality is the optimal compensation contract, firms that follow the equal pay structure will deliver better performance than those firms operating under another compensation contract. Harmony in management team prevails over competition, and *ex post* results are predicted to be inversely related to pay differential (H6).

A criticism of the pay equality model is that egalitarianism is not an universal virtue. It is human nature to free ride on others' effort if the same pay among all top executives is to be expected at all times. We shall address this issue in the next section.

2.3. *The team player model*

The tournament model offers, on the one hand, a strong incentive to perform, but on the other hand, it risks the possibility of executives engaging in noncooperative and disruptive behaviours. The pay equity model has the exact opposite properties: fewer negative externalities coupled with corresponding lesser incentive for the managers to exert their best efforts. A viable alternative should incorporate both these models' desirable features, and remedy their shortcomings.

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[2] There is, however, another interpretation of the pay equity model. Instead of near equality of pay between the CEO versus the rest of the top executives (between ranks), the second version is concerned with pay equality among the other top executives (within rank). This version, although interesting in its own right, is not tested here as the Israeli reporting requirements only demand the average, not individual's, pay for the group.

With these objectives in mind and incorporating previous research on teams.[3,4] We propose a third pay structure model. A team player model has the following elements:

(a) Senior executives of a firm are, first of all, expected to be players on the same team. Conversely, those who are not team players will not fit nor survive in this environment.[5]
(b) The board of directors that evaluates the CEO and all senior executives in an open/professionally managed firm, realise that there are two not mutually exclusive components of senior executives' performance: (i) the individual's specific contribution (which may be a quantitative rank order, or in quantitative monetary terms), and (ii) the contributions of all the executives as a team in creating firm values.
(c) In the evaluation of senior executives, the Board will maintain two separate scoring systems in which the senior executives are fully aware: (i) Salary raises and bonuses, or any other forms of monetary rewards, are to be based mainly on the firm's aggregate performance. This will encourage cooperative or 'helping' behaviour among senior executives, i.e. to be good team players (ii) promotion will be based on a senior executive's exhibited ability for the CEO's position, including the ability to act as a team leader, e.g. to get the most out of the team players as a group. As a result, executives will compete to add the most value to the team. The team player model has the advantage of eliminating harmful noncooperative behaviours while maintaining competitions of the type that also maximises positive externalities from cooperating with other executives.

The main advantage of the team player model is its adaptability. For instance, it can admit 'superstars' in a team, where other less talented senior executives are willing to cooperate since helping the superstars could give them greater rewards as well. In contrast, the tournament model would find competing senior executives colluding to sabotage the superstars' effort, while the lack of incentive to perform in the pay equity model could not attract superstars at all. Another case for the team player model is its ability to accommodate the no tournament owner-managed firms. The owner managers are more concerned with cooperation among executives, and they can deal with non-optimising, non-cooperative

[3] McLaughlin (1994) argues that optimal team incentives promote cooperation among workers, generate efficient effort supply, and economise on measurement costs. See also McAfee and McMillan (1991).

[4] Nalbantian (1987) surveys the literature and find evidence supporting the claim that group incentives can and often do contribute to significant increases in labour productivity and firm performance. Gomez-Mejia and Balkin (1989), in a study of R&D personnel find that team based bonus is perceived as the most effective reward system. Nalbantian and Schotter (1997) examines various individual and group compensation schemes in a laboratory setting and find that competitions among teams, e.g. relative performance, results in the greatest effort.

[5] To apply the sports analogy in the tournament model, the distinction here is that running a business is more like a team sport, such as football or basketball, and not an individual sport such as tennis or golf. The success of the firm is often viewed a team effort (Atkinson, Stanley and Tschirhart, 1988).

or even destructive behaviours more forcefully via firing and job reassignment etc.

The team player model is more likely to be observed among firms (1) where cooperation among senior executives is crucial to the success of the firm, e.g. when senior executives have specialised but different skills in production, engineering, finance, marketing, or legal and regulatory matters, and (2) when these senior executives are not separately in charge of unrelated business groups of a diversified parent.

The first empirical implication of the team player model is that it allows pay differences among executives. Executives whose marginal products are greater are paid higher. Observe that in the tournament model, pay differential exceeds the executives' marginal products by the amount of tournament prize. In contrast, pay differential under the team player is positive but less than that in a tournament model (H7).

Reward, or pay to performance, is expected to be highly related to the team performance (H8). Interestingly, pay differentials and firm performance should be unrelated (H9) this is because pay differentials reflect mainly differences among the executives' marginal products.

2.4. *The reward to entrepreneurship model*

Theories of executive compensation often take for granted that the prevailing business organisation is a corporation with diffuse ownership whose CEOs own few shares. Similarly, it is commonly assumed that there are external competitions for the right to manage the firm, e.g. mergers and acquisitions. Furthermore, there exists a well developed external managerial labour market.

A major deficiency of the model developed under this setting is the omission of an important class of business structure: these are firms in which individuals (family or partners) own a large or even majority shares. The managers (CEOs) of these firms are overwhelmingly owners—founders, heirs, and partners etc. There may have been a problem of succession, but it will be among family members or partners. Outsiders who are senior managers understand that they are not candidates for the position, i.e. the tournament model is no longer applicable. To explain the levels and changes in pays and pay differentials among owner managed but publicly traded firms, we need to consider a different paradigm.[6]

A publicly traded but majority owner controlled corporation must have a set of workable governance structure to enable it to grow, and to raise external funds. It may differ from non-majority owned firms in many ways such as the ability to pursue long term objectives, and a greater likelihood to have a major owner as a manager. If the internal executive labour market for family and partners-owned firm functions properly, the entrepreneurial ability (creativity and intelligent risk taking), and organisational ability of the owners will be valued. Thus the superior owner entrepreneur will receive high, absolute and

[6] The existence of business forms where the tournament model does not apply helps sharpen the empirical tests. Support for the tournament model is unambiguous only if it can be shown that contestable situations exhibit tournament-like behaviour while non-contestable ones do not.

relative, pay. The chosen owner-managers are also likely to receive a highly sensitive pay to performance contract for several reasons. First, by having more control of the business decisions, they bear more direct responsibility for the firm's success or failure. Second, having more personal wealth than the outsiders/professional managers would also allow these owner managers to receive negative pay changes (cut) when the firm's performance is observed to be poor. Third, superior owners may still demand performance sensitive pay to compare with peers (other CEOs), and for personal satisfaction.[7]

Family and partnership firms may be willing to hire professional outsiders for their specialised skills as senior managers. The firms would have to pay outsiders at least the market wage and a high power contract, i.e. highly sensitive to the firm's performance. This is for two reasons: (a) owner managers, who want senior executives to be good team players, have to structure compensation contracts that are based on overall firm performance and (b) outside senior executives would also demand more generous compensation in monetary terms and with respect to performance when the opportunity to final promotion to the CEO position is not available.

Pay differential between the owner-CEO and other senior executives are expected to be relatively high in both absolute monetary terms (H10), and in period to period changes (H11). The reasons are: (1) More wealth creation are associated with talented entrepreneurs;[8] (2) As part or majority owners, they are more willing to take a pay cut in bad times, i.e. pay raises and cuts are more symmetric and sensitive to performance for owner operated firms. Or econometrically, the pay to performance coefficient should be a lot higher if pay cut are more likely in an owner controlled firm *vis-à-vis* the more sticky downside pay pattern among outside manager controlled firms; (3) When outsider runs a family business under the monitoring of a single large block holder, it is less likely he or she can extract all or most of the value of control rights. Thus, the compensation of these executives is expected to be high in absolute term and in the reward to performance incentives; (4) Outside executives in an owner run firm are expected to earn greater absolute and performance based reward as they are not counting to receive, on expected value basis, greater compensation as future CEOs.

Finally, we expect pay differential and firm performance to be highly positively correlated (H12). The causality is from higher performance of the entrepreneur that earns him/her higher compensation.[9] Thus, in the simple case where expectations about a manager's ability are fulfilled, one should observe the top

[7] Although it has been argued elsewhere that owners may receive less compensation since they are also receiving income from their share ownership. This line of argument is faulty as it confuses return to capital (where every investor has the right to expect an appropriate return regardless of percentage ownership), from return to managerial labour.

[8] On the other hand, Murphy, Schleifer and Vishny (1991) found that in countries that reward rent seekers more than entrepreneurship, stagnation ensues.

[9] An argument could be offered to explain why there should be no relationship between performance and CEO to other officer pay differential, i.e. the pay differential as a contract choice is already an optimal arrangement. This line of reasoning is a flawed application of Demsetz and Lehn (1985) argument. An optimal contract is always expected to induce and reward a good manager who can deliver superior performance.

executive to receive greater compensation for superior performance as stipulated in the contract. And in the case where expectations correspond to result with an error, the pay to performance relationship still should hold, as any rational compensation scheme would increase (decrease or not change) the compensation of executives who show positive (negative) performance surprises.

3. Contestability, organisational structure, and the testing of pay structure models

As discussed in the previous section, a crucial element in the design of empirical tests for various pay structure model is the contestability (or lack of) in the CEO position. Since this variable is not a matter of public record, a suitable proxy has to be found. An innovation in this study is the use the organisation and ownership structures of firms to construct relative measures of the degree the CEO position is contestable. To illustrate the idea, consider the taxonomy of organisational/ownership structure shown in Figure 1. Start with the far left mode of the hierarchical tree of a sample of publicly traded firms, a way to dichotomise this sample is to classify the firms based on ownership and control: majority owned

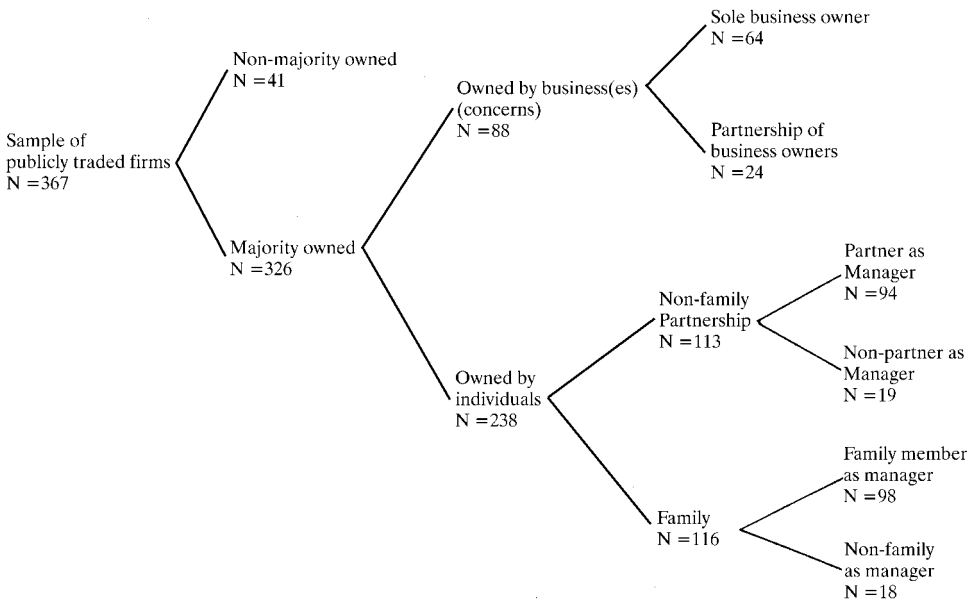

Fig. 1. A classification of the sample of publicly traded Israeli firms by ownership structure. The firms are classified into a 2 (majority versus non-majority) × 2 (business/concern owned versus individual owners) × 4 (sole versus partnership of business concerns; non-family versus family) × 4 (non-family, partner versus non-partner as manager; Family, owner versus non-owner as managers) hierarchical tree of ownership structure. N indicates the number of firms in a particular classification.

versus non-majority owned. Here, it is reasonable to expect the probability of succession or contest to the CEO position among unrelated persons to be greater in a non-majority firm than a majority owned firm. The latter firm is more likely to be succeeded by a designated heir of the majority owners, while the former firm's board can name CEO successor from either the current pool of unrelated executives, or even from among outside candidates.

Among the majority owned firms, we can further identify two subcategories: those that are owned by other businesses versus those owned by individuals. Businesses that are owned by other firms are less likely to be headed by relatives or close associates of the parent companies' executives. CEO successors to such firms could be unrelated persons either from the ranks of the firm or its parent. In contrast, top executives in firms whose owners are individuals are more likely to be related to the owners.

Businesses that are owned by other firms may either have a sole firm as owner, as in majority owned subsidiaries, or have several firms as owners, as in joint ventures. The contestability of the CEO position is probably less clear cut here than all other organisational structure pairs. The contestability of the subsidiary CEO position is likely, as this stage may be viewed as just an intermediate round in the tournament leading to the final round vying for the parent company's CEO position. However, the contestability of the CEO position at a joint venture firm can vary from little low (when politics, bargaining power, and coalitions among the partner firms determine the next CEO) to very high (when the joint venture enjoys autonomy from the partner firms and can choose its own CEO). Pay differential between the CEO and the other executives in a joint venture could either be: (i) higher in a joint venture (as the final round) than a subsidiary (an intermediate round), or (ii) lower when joint venture politics dictate the CEO selection, where the other top executives are to represent various joint venture partners' interests.

Among the firms owned by individuals, the owner(s) may be a family/individual, or a partnership of non-family member. We expect the succession to the CEO position be more competitive in a partnership, i.e. among partners or their nominees. Finally, within a family owned firm or a partnership owned firm, we expect those firms that already have outsiders serving as chief executives, reflecting a lack of suitable or willing heirs, to be more likely to name another outsider as successor.

The hierarchical classification of firms mirrors the organisational and ownership structures of firms in most countries. From an empirical testing viewpoint, it provides a way to measure 'relative' contestability between groups of firms with different ownership structures though the extent of succession competition for each firm may not be known.

Table 1 summarises the differences in the empirical predictions of various models of pay structures among top executives. The tournament model will pay the top executives more, in firms whose organisational structures induces greater competition among other top executives, by the amount of the prize or inducement. It is higher than the pay differential that prevail in: (i) the team player model, where CEOs are supposed to be the most talented but paid only for their marginal product, (ii) in the pay equality model, which predicts no pay differential among executives. In the non-tournament situation, however, the entre-

preneurial model will reward the superior CEOs. Entrepreneurs are rarer than good managers who are decision makers and supervisors.[10]

4. Data

This study is based on a large sample of publicly traded firms listed on the Tel Aviv Stock Exchange (TASE) at the end of 1994. Listed Israeli firms are required to disclose compensation information on company reports under Section 123a of the Company Ordinance Law, and Section 64 of the Securities Regulations. However, it was not until 1993, under the Arrangement of Financial Statements of the Securities Regulations, that publication of fairly consistent and comparable compensation data across firms started. Prior to 1993, there was

Table 1

Empirical implications of various top executives pay structure models.

The table presents the predictions of four executive pay structure models with respect to various pay structure issues. The pay level ratio (PLR) is the pay of CEO divided by the average pay of the next four senior executives. Pay to performance sensitivity is the increase in pay in monetary terms (NIS) in response to an increase in firm performance (where firm performance is represented by measures such as after tax income). PSR is the ratio of the pay to performance sensitivity of CEO and the pay to performance sensitivity of the next four senior executives. A zero (0) indicates that the discussed model has no prediction with respect to the issue or variable.

	Models of executive pay structure			
	1	2	3	4
Pay structure issue or variable of interest	Tournament model	Pay equity model	Team player model	Reward enterpreneurship model
Pay of CEO divided by pay of senior executives (PLR)	Very high	Lowest (near 1.0)	Greater than 1	Highest
Absolute value of pay to performance sensitivity	Low	Lowest	High	Highest
PSR (ratio of CEO's to next four senior executives' pay to performance sensitivities)	High (PSR = PLR)	Lowest (near 1.0)	Lower (PSR < PLR)	Highest
Effect of pay differential on performance	Positive (high)	Negative	Zero	Positive (highest)

[10] It should be pointed out that there is a fifth explanation—the entrenched CEOs model. In this agency cost based behaviour, entrenched CEOs' pay are not function of marginal product. Being a risk averse own utility maximiser, the entrenched CEO will receive high absolute and relative pay that are not sensitive to performance, i.e. lack of alignment or accountability.

no uniform interpretation of the definition of various components of compensation such as bonuses and benefits.

The study relies on post 1993 data only. Specifically, the compensation and financial information are from company reports, and the share price data are from the Tel Aviv Stock Exchange quotes. Both these data sets were obtained from the databases of the Israeli Securities Authority (ISA), which is the counterpart of the US SEC.

We have omitted firms that did not report compensation data on time or in the right format. The judgment as to the accuracy and completeness of the compensation statements was made by the experts at the ISA. The 367 companies included in this study represent 57% of the firms whose stocks are listed in the Tel Aviv Stock Exchange. In terms of market capitalisation, they represent over 70% of the total.

Reported executive compensations include salary, bonus, and certain benefits such as pensions, car and car expenses, personal loans, but do not include vacation, meals etc. We have collected compensation data for the CEOs, and the average compensation of the next four highest ranking senior executives.[11]

Information on organisation structures is collected from various sources such as 'Holdings of Interested Parties' issued by the Israeli Securities Authority (ISA), the 'Meitav Stock Guide' and 'Globes Stock Exchange Yearbook.' We have also used some public reports filed with the ISA. In 15% of the sample, some portion of family holdings were suspected to be disguised as holdings of foreign or other domestic companies. We rely on intimate knowledge of consultants and experts from the industry to make the ownership determination.

A taxonomy of various firm types is summarised in the hierarchical organisational tree of Figure 1. Only about 10% of firms are not over 50% controlled by a small group of interested parties', where interested parties are defined as insiders and blockholders with over 5% of shares. These 'non-majority' firms are usually larger and older, more established firms, with more diffused ownership.

Of the majority owned firms about three fourth's are owned by individuals while the rest are owned by a corporation operating as independent subsidiaries, or are joint ventures of two or more corporations. Among the firms that are owned by individuals, slightly over half are owned (i.e. over 50% ownership) by a single dominant family, while the rest are partnerships of several individuals. Although an overwhelming majority of the companies controlled by families or partnerships are also managed by family members or partners, about 15% hire outsiders as managers. Overall, counting direct ownership and controlled firms as well as indirect ownership via shares in independent subsidiaries and partnerships with other individuals, or firms in joint ventures, the family/business group is the predominant owner of businesses in Israel. This pattern of ownership is probably the norm in all the world's economies, outside a few countries with long established capital markets, such as the USA or UK.

The main index of performance used in this study is the firm's after tax income, a measure that has been found useful in numerous studies of executive pay and performance (see Ely, 1991; Lambert and Larcker, 1987). Although the stock market in Israel is quite volatile, share returns are also used in some

[11] Options are relatively rare. Only less than 15% of the firms mention options, and of these less than half reported the terms of the options.

empirical models.[12] Three measures of executives' pay are calculated. The first is in absolute pay in NIS (New Israel Shekels). The second is relative pay calculated in two ways: (i) the pay level ratio (PLR) which is the CEO pay divided by the average pay of the next four senior executives (Pay4); and (ii) the difference in NIS, between CEO pay and the average senior executives' pay (CEO Pay—Pay4). The pay level ratio (PLR) is a type of standardisation that allows cross-sectional comparisons. The pay difference, however, enables calculation of the CEO's incremental pay over the other executives and its sensitivity to firm performance.

The third pay variable examined is a conditional (on performance) measure: pay to performance sensitivity. It measures the increase in pay in NIS for a 1,000 NIS increase in the firm's performance (where performance is measured by profit). This is a fairly accepted indication of how well executives' pay is aligned with that of the shareholders (Jensen and Murphy, 1990). It is obtained from a regression of executive pay on firm performance, and firm size. We calculate, in separate regressions, the pay to performance coefficients for the CEOs and for the other senior executives. The ratio of the pay to performance coefficient of the CEO and the pay to performance coefficient of the other four senior executives is termed the pay sensitivity ratio (PSR).[13]

5. Results and analysis

5.1. *Preliminary analysis*

Table 2 presents descriptive statistics of the entire sample, as well as for six dichotomous pairs of firm types. The statistics, mean, standard deviation, median, minimum and maximum values are reported for the CEOs, the average pay of the next four highest ranking executives, and the pay ratio of CEO to next four executives (PLR). We find that:

- CEOs in Israel receive on average over 650,000 NIS per year, while the median is only slightly over 550,000 NIS. Senior executives receive slightly more than half of CEOs' pay, but the range can vary from only a fifth to almost equal pay.
- The average value of pay ratios (PLR) does not seem to vary across firm types. In fact, most paired comparisons of mean PLRs show statistically insignificant difference between a more contestable organisational/ownership structure and its less contestable counterpart. The evidence does not support

[12] For instance, average stock returns in the Tel Aviv Stock Exchange were: 56% (in 1991), 94% (in 1992), 40% (in 1993), −39% (in 1994), and 14% (in 1995). Share prices are definitely a noisier measure of performance than accounting incomes.

[13] Ideally, we would prefer to estimate pay to performance sensitivity for each firm. Unfortunately, the time series of available data is too short for this purpose. The problem is alleviated somehow due to the empirical design used. Because we classify firms into more and more homogeneous groups, the assumption of similar parameters among firms in a cross section becomes more reasonable.

Table 2

A descriptive summary of top executives' pay structure across various firm types.

The table reports the number of firms in the sample (n), the mean pay of CEO in thousands of NIS (PayCEO), the mean pay of the next four top executives (Pay4), the mean ratio of a firm's CEO pay to the average pay of its senior executives (PLR), their standard deviations (SD), median, minimum (min) and maximum (max) values. Aside from the overall sample, there are six dichotomous pairs of hierarchical firm types (see Figure 1). Asterisks (*) indicate the organisational structures that are more likely to have competition for the CEO position (contestable).

Sample or compared subsamples	Variables	n	Mean	SD	Median	Min	Max
0. All firms	PayCEO	367	662	449	556	123	4,080
	Pay4		352	208	303	100	1,620
	PLR		1.959	0.782	1.783	1.011	4.921
1. Majority controlled *vs.*	PayCeO	326	655	436	558	138	4,080
	Pay4		351	203	304	102	1,620
	PLR		1.942	0.766	1.759	1.011	4.921
non-majority*	PayCEO	41	723	541	552	123	2,627
	Pay4		356	246	281	100	1,441
	PLR		2.095	0.884	1.875	1.042	4,743
2. Concern owned* *vs.*	PayCEO	88	744	412	610	130	2,529
	Pay4		407	231	330	105	1,620
	PLR		1.9162	0.654	1.798	1.012	4.191
individuals owned	PayCEO	238	622	442	528	138	4,080
	Pay4		330	185	303	102	1,516
	PLR		1.952	0.805	1.744	1.011	4.921
3. Sole concern	PayCEO	64	667	302	587	130	1,810
(independent subsidiaries)	Pay4		366	180	322	105	992
vs.	PLR		1.937	0.700	1.7735	1.012	4.191
partners of concerns*	PayCEO	24	950	575	812	254	2,529
(joint ventures)	Pay 4		517	325	442	177	1,620
	PLR		1.861	0.519	1.818	1.182	3.483
4. Partnership-controlled*	PayCEO	113	580	338	501	138	2,297
vs.	Pay4		321	157	304	102	1,092
	PLR		1.879	0.800	1.609	1.011	4,847
family-controlled	PayCEO	116	662	533	538	185	4,080
	Pay4		342	214	282	121	1,516
	PLR		2.011	0.819	1.798	1.039	4.921
5. Partnership:	PayCEO	94	588	344	503	138	2,297
manager as owner *vs.*	Pay4		323	160	305	102	1,092
	PLR		1.910	0.853	1.605	1.011	4.847
partnership with	PayCEO	19	543	312	499	200	1,503
professional manager*	Pay4		313	1505	303	130	721
	PLR		1,729		1.618	1.112	2.744
6. Family controlled manager	PayCEO	98	658	561	537	214	4,080
as owner *vs.*	Pay4		335	219	266	121	1,516
	PLR		2.048	0.863	1.798	1.039	4.921
family with	PayCEO	18	680	352	644	185	1,308
professional manager*	Pay4		378	183	393	125	778
	PLR		1.811	0.485	1.747	1.232	3.252

the simple version of the tournament model. However, there is a sizable dispersion in pay ratios within each group.[14]

- Only a few firms reported a near 1.0 PLR that support the pay equity model.

5.2. *Tests of the pay-structure models: an overview*

Table 3 reports the estimates of the pay to performance sensitivity coefficients from a regression equation that also adjusts for the effect of size on compensation.[15] The pay to performance sensitivity coefficients are all positive and statistically significant. On average, a CEO receives a 5.79 NIS increase in compensation (and an average senior executive receives a 3.19 NIS increase in compensation) for a 1,000 NIS increase in the firm's net income.

The relative values of the pay-performance coefficients in Table 3 range, for CEOs, from a high of 29.5 (in family owned and managed firms) to a low of 3.55 (in non-majority owned firms). For the other senior executives the range is from 8.48 (family owned and outsiders managed firms) to 2.41 (for non-majority owned firms). We find the relative values of these coefficients highest among non-contestable firm types such as family or partner owned firms. The result is more in line with the prediction of the reward to entrepreneurship model.

Table 4 examines the pay structure implications of the models in this paper. It presents for various dichotomous classifications of the sample firms the average PLR (pay level ratio),[16] and PSR, the pay to performance sensitivity ratio (α_1 of Pay CEO divided by α_1 of Pay4, both from Table 3). T-tests of the difference between the PLR and PSR of each group, (for testing the models in Table 1) are also reported. To present a more organised discussion, we analyse each pair of firm types (more vs. less contestable) by tracing the hierarchical tree in Figure 1.

5.2.1. *Non-majority versus majority controlled firms*. The reported PLRs (column 1, Table 4) are greater than 1.0. Therefore, the simple version of inter-rank pay equity is rejected. The pay equity model is also inconsistent with the estimated values of PSR, which exceed 1.0.[17]

The PLR of the more contestable non-majority owned firms, is not statistically greater than that of the majority owned firms. Also, the PSR of non-majority firms is not as high as its corresponding PLR, suggesting a high power pay for performance contract for the group of senior executives relative to that of the CEOs. (The lower the PSRs, the closer are the pay to performance rewards of the CEOs and their senior executives).

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[14] Although the pay level ratio (PLR) is high, ranging from 1.7 to 2.1 (or 70% to 110% premia for CEO pay), it is small relative to comparable US data where CEO pay premia are twice as large. Main, O'Reilly and Wade (1993) report CEO pay premia of 140% (300%) over the second high-rank executive (the average of top executives, respectively).

[15] Upon closer examinations, we find that some of the highest paid executives run much larger companies. Therefore, size adjustment is needed and thus included in all subsequent analysis.

[16] PLR (α_0) the pay level ratio calculated from the regression intercepts in Table 3 is new and is intended to measure the ratio of 'base' pay only, i.e. the ratio of observed compensation minus bonuses paid for performance and size. This 'base' pay PLR may neutralise some of the *ex-post* noise in the standard PLRs.

[17] The result is consistent with those of Main, O'Reilley and Wade (1993), who also do not find support for the pay equity model among top executives.

Table 3

Pay to performance sensitivity coefficients for various firm types.

The table presents the results of the regression, Pay = $\alpha_0 + \alpha_1$ Inc + α_2 ln TA + e, where Pay = PayCEO or Pay4 (the average pay of the next four senior executives), Inc is the 1994 after tax net income of the firm, ln TA is the logarithm of the firm's total assets after orthogonising it to the effect of net income. Aside from the overall sample, there are six dichotomous pairs of hierarchical firm types (see Figure 1). *t*-statistics appear in parentheses. Asterisks indicate the more contestable organisational type.

Sample or compared subsamples	No. of observations	Intercept (α_0)		Coefficient of Inc (α_1)		Coefficient of ln TA (α_2)		R^2	
		PayCEO	Pay4	PayCEO	Pay4	PayCEO	Pay4	PayCEO	Pay4
0. All firms	367	617,846	327,758	5.793 (8.82)	3.189 (11.05)	116,248 (7.04)	53,737 (7.41)	0.283	0.353
1. Non-majority*	41	720,988	349,333	3.549 (2.01)	2.459 (2.75)	206,644 (2.32)	66,471 (1.68)	0.138	0.171
Majority controlled	326	602,229	323,823	7.134 (10.38)	3.733 (12.31)	108,111 (6.61)	52,272 (7.25)	0.309	0.377
2. Concerns owned*	88	613,677	323,316	5.479 (8.48)	3.449 (10.20)	64,220 (2.79)	38,480 (3.20)	0.461	0.554
Individuals owned	238	601,729	324,108	21.445 (10.49)	6.138 (6.60)	154,549 (7.05)	74,817 (7.50)	0.401	0.293
3. Sole-subsidiaries	64	600,811	321,115	3.756 (4.00)	2.557 (4.85)	76,779 (3.14)	50,840 (3.09)	0.263	0.345
Joint ventures*	24	695,177	361,302	5.989 (6.12)	3.731 (8.33)	82,046 (1.64)	36,250 (1.58)	0.616	0.748
4. Family controlled	116	632,435	334,749	27.299 (8.20)	6.480 (4.32)	163,136 (3.00)	89,418 (4.86)	0.414	0.260
Partners controlled*	113	575,530	319,912	15.150 (6.61)	5.805 (5.17)	145,464 (6.62)	69,476 (6.46)	0.433	0.372
5. Partnerships: owner as manager	94	592,138	324,542	23.068 (8.53)	7.858 (5.34)	173,734 (7.18)	79,744 (6.05)	0.567	0.403
Partnerships: outside professional as manager*	19	518,747	298,277	5.320 (1.91)	3.360 (2.15)	109,211 (2.34)	64,554 (3.34)	0.227	0.427
6. Family owned firm run by manager	98	644,343	329,063	29.531 (7.82)	5.871 (3.421)	203,214 (4.45)	100,110 (4.82)	0.453	0.258
Family owned firm run by professional manager*	18	555,944	324,707	19.742 (3.54)	8.481 (2.59)	73,170 (0.99)	38,973 (0.90)	0.409	0.251

The evidence of high pay to performance sensitivity for the other senior executives favours the team player model. This is particularly true for the supposedly more contested non-majority firms.

5.2.2. *Concern owned vs. individuals' owned firms*. CEO position in a firm controlled by one or few concerns is expected to be more contestable than in firms owned by individuals (family or partners). We find no support for the tournament model as there is no difference in the pay level ratios (PLRs). Moreover, the PSR of the concern owned firm is significantly lower than its corresponding PLR, i.e. CEO's reward for performance incentive is closer to those of the other top executives. This suggests that the parent companies of these firms prefer that the executives of their subsidiaries or joint ventures adopt a cooperative mode of behaviour (as team players) than a competitive mode (as in a tournament).

The pay equity model fails to find support in the data analysed as both PLRs and PSRs are significantly greater than 1.0. In contrast, the high power reward

Table 4

Testing the pay structure implications of the models: comparing PLRs and PSRs of six dichotomous pairs of firm types.

PLR is the ratio of PayCEO to Pay4 (the average pay of the next four senior executives). PSR is ratio of their pay to performance sensitivities taken from Table 3 and the expanded regression model (Appendix A). PLR(α_0) is the ratio of the intercept terms (α_0) taken from Table 3. (It is a measure of base pay before bonuses for performance and size increase.) Column 4 reports the *t* values for comparing the PLR to PSR in each firm type. Asterisks indicate that it is the more contestable organisational structure.

	1	2	3 PSR		4
Compared subsamples	PLR*	PLR (α_0)	Basic	Expanded	*t* (PLR − PSR)$_b$
1. Majority controlled	1.94	2.06	1.91	1.88	0.73
vs. non-majority*	2.10	1.86	1.44	1.20	4.72
2. Concern owned*	1.92	1.87	1.59	1.59	4.70
vs. individuals owned	1.95	1.86	3.49	3.47	−29.57
3. Subsidiaries of a concern	1.94	1.87	1.47	1.36	5.34
vs. joint ventures of concerns*	1.86	1.92	1.61	1.67	2.41
4. Family controlled	2.01	1.89	4.21	4.28	−28.97
vs. partners controlled*	1.88	1.81	2.61	2.51	−9.71
5. Partnership: manager owner	1.91	1.83	2.94	2.78	−11.67
vs. partnership: professional manager*	1.73	1.74	1.59	1.53	1.43
6. Family: manager-owner	2.05	1.93	5.03	5.28	−34.22
vs. family: professional manager*	1.81	1.71	2.33	1.84	−4.52

* a. The dichtomous differences in PLR are all statistically insignificant.

b. This is a test whether average PLR in a certain firm type equals the PSR parameter computed from Table 3.

to the CEO (high average PSR relative to PLR) in individuals owned firms agrees with the prediction of the reward to entrepreneurship model.

5.2.3. *Independent subsidiaries versus joint ventures.* Both firm types have a contestable CEO position. On the one hand, the competition for the CEO post in the independent subsidiaries may be only one of a sequence of tournaments leading to promotion to the parent firm. On the other hand, the joint venture's CEO may either be the final round of a tournament, or a political appointment made by the coalition of partners (no tournament).

The results show that there is no difference in the PLRs of independent subsidiaries and joint ventures. The small difference in CEO vs. senior executives' incentive to align pay with performance (low PSR) supports the team player model. It suggests parent companies structure pay incentives to encourage more cooperation and less competition for the entire management team. This could be the optimal compensation contract for joint ventures.

Consider the top management team of joint venture firms, the executives could possibly represent the interests of different partners/firms. The result is an inherently unstable coalition unless these top executives have their pay based on the team's performance. Interestingly, the pay performance coefficient and R^2 in Table 3 are higher for both the CEO and senior executives pay in joint venture firms. This confirms that firm, not individual, performance accounts for an overwhelming percentage of executives' pay variations in joint venture firms.

There are also good reasons for parents of independent subsidiaries to emphasise cooperative behaviour among the senior executives. For instance, for a parent with many such subsidiaries, it would be expensive to monitor or resolve frequent conflicts among the subsidiaries' executives. The team playing model is therefore a more workable alternative.

5.2.4. *Family owned versus partnership owned firms.* Only about 15% of family and partnership owned firms hire outsiders as managers. Thus, most of the CEO positions in these firms are not contestable as far as outsider senior managers are concerned. At the margin, the CEO position may be more contestable among partners than for a family owned firm. Although it is imaginable that a family owner may want to encourage heirs to compete without designating an apparent successor, it is unlikely (see the lesson of Shakespeare's *King Lear*).

We find no statistical difference in the pay ratio (PLRs) between the two firm types, thus providing no support for the tournament model. However, we find higher reward to performance for the CEOs relative to those of the other executives, which on the surface seem not to support the team player model either.

A possible explanation for the high PSRs is that owners/CEOs are better monitors, and thus substitute monitoring for alignment via compensation for the other top executives. A closer examination shows that the high PSR is not due to the low pay performance sensitivity of the senior executives in these firm types, but to the much higher pay performance sensitivity for their CEOs, consistent with the reward to entrepreneurship model. An examination of the absolute values of pay to performance coefficients of senior executives in both family and partners owned firms (see Table 3) shows that their pay performance coefficients are also large. They are about twice the size of their counterparts in

non-majority, subsidiary, or joint venture firms. Thus, team performance is encouraged (high level of pay to performance for the other senior executives), yet the reward to the entrepreneur is even greater.

5.2.5. *Partners versus outsiders as CEOs in partners-owned firms*. It is expected that if a partners-owned firm is managed by an outsider, the CEO position is more open to competition of the kind perceived by the tournament model. The pay ratio evidence again fails to support the tournament model; there is no statistical difference in the PLRs of these two firm types.

The results show that the pay structure of outsider-managed partners' owned firms is similar to other outsider managed firms such as non-majority and concern controlled firms. The low PSR for this group shows that, similar to joint venture firms, individual partners prefer that the top executives be team players pursuing the same common goal of maximizing the firm and thus partners' value.

Finally, the relatively high PSRs observed for CEOs who are also partners support the reward to entrepreneur model and the hypothesis that the most capable or entrepreneurial partners are chosen as CEOs and given a high powered incentive package. The PSR of owner-manager is lower in partnership firms than in family firms (see next subsection), which suggests that the other non-managing partners exercise monitoring as a substitute for pay to performance incentives in their effort to mitigate potential agency costs.

5.2.6. *Owners versus outsiders as CEOs in family owned firms*. Once a family hires an outsider as CEO, outsiders are expected to have greater likelihood to become CEO in future successions. The CEO position thus may be regarded as contestable. The table shows that the PLR of outsiders managed family firms is not statistically greater than that of owner managed firms. (In fact, the mean value is lower.) This seems inconsistent with the tournament model.

The very high PSR of the owner managed family firms could only be consistent with the predictions of the reward to entrepreneurship model. The PSR of the professional manager in family owned firms is also relatively high (2.328), greater than those in all non-individual owned firm types: subsidiary, joint venture, and non-majority owned firms. This evidence further suggests that family firms are willing to reward outsiders who may not be allowed to own significant ownership, handsomely in cash pay. In the process, aligning their pay to the firms' performance and perhaps admitting the outsider's superior specialised skills.

5.3. *Expanded model*

To test the robustness of our results, we estimate an expanded regression model. We add to the regression of pay on size and net income three other potential determinants of executive compensation: (1) abnormal stock returns, (2) leverage, and (3) an industry effect dummy

Abnormal stock returns, *ARI*, are calculated by subtracting the market model adjusted return from the stock return, or, $AR_i - (R = a_i + b_i R_m)$. The high volatility of the Israeli stock market in general could make the measure subject to sizable noise. Nevertheless, abnormal returns may be used by the firm's board of directors to gauge the management team's performance relative to the rest of the economy. We expect that shareholders/board of directors of certain organisa-

tional structures such as the non-majority owned firms would need additional external measures of management performance, and would tie their executives' pay to the abnormal returns.

The leverage variable is added as it represents the class of alternatives to reduce agency problem via monitoring by debtholders, in lieu of pay as incentives. High level of monitoring by other claimants of the firm such as debtors may reduce the need to align the executives via higher power pay contracts. Finally, a dummy variable for industrial firms versus other firms is used to allow for pay differentials due to the differences in the pay norms among various sectors of the economy.

The regression results are presented in Appendix A. We find that: (i) Our results concerning the sensitivity of pay to net income are quite robust. The PSRs calculated from the expanded version are similar to those obtained from the basic model both in magnitude and in the ranking between the dichotomous organisational types (see Table 4 column 3). (ii) The leverage variable is mostly insignificant. (iii) The industry dummy coefficients are not significant. (iv) The coefficients for abnormal stock returns are mostly insignificant, which renders the analysis of pay sensitivity to performance based on share returns meaningless. It appears that most managers and firms prefer to link compensation to net income rather than to stock returns. This result may be specific to Israel where stock market is quite volatile. Alternatively, the use of net income as a performance measure could also reflect a desire by the many owner-managers in the sample not to link their compensation with stock returns. These owner-managers' wealth is already related to stock return. Hence, they may prefer their managerial pay link to net income.

5.4. *The relationship between performance and pay ratio*

Thus far, we have analysed the implied executive compensation contracts and their agreement with certain pay structure models (tournament, pay equity, team player, and reward for entrepreneurship). In this section we provide an alternative test of these models that is based on the firms' actual performance. Specifically, the idea is that the best compensation contract (or pay structure model) should provide the best incentives for the top managers, thus delivering superior *ex post* results. For instance, if the pay structure recommended by the tournament model gives the optimal contract, then in the contestable CEO cases, PLR should be positively related to firm performance. On the other hand, a negative relationship between PLR and firm performance supports the pay equity model, while a lack of significant relationship (in combination with low PSR) provides credence to the team player model. Finally, for the subsample of firms with non-contestable CEO positions, the reward to entrepreneur model would predict a positive relation between PLR and firm performance.

Column 1 of Table 5 shows that the coefficients of PLR (= PayCEO/Pay4) in regressions seeking to explain performance are in general statistically insignificant. This is found in the overall sample, as well as in all paired comparisons. The exception being those organisational types that can be traced, in the hierarchical data tree of Figure 1, to include a branch with a large proportion of owners as managers (the non-contestable subsample). In other words, performance increases coincide with greater pay ratios between the CEO and other

senior executives only when the CEO position is non-contestable. This result supports the reward for entrepreneurship model.

We have also tried several alternate specifications, relating pay and pay structure to performance. The addition of pay level to the regression (columns 2 and 3) does not change the branches of the data tree that shows significant pay ratio effects: individually controlled → family controlled → owner managers in family firms (or partners' firms). The same set of firm types appears significant also when pay differences are used instead of pay ratios. In the last specification, we can interpret the regression coefficient of the pay difference variable as the marginal increase in the after tax income of the firm for a NIS increase in pay differential in favour of the CEO, usually the entrepreneur, versus the average pay of the senior executives. The regression results estimate after tax income increases of 14.8 NIS and 17.5 NIS, for the family owner manager firms and the partner-manager firms, respectively. These results provide support that among owners controlled firms, more talented executives or entrepreneurs are rewarded for superior performance, in addition to their gains from share ownership.

To summarise, the results in Tables 4 and 5 show that only the reward for entrepreneurship model (predicting a positive relationship in non-contestable situations), and the team player model (predicting a statistically insignificant relationship in contestable succession situations) receive support from the data.

6. Conclusions

The study examines several theories explaining top executive pay structure. The research design is unique in three ways. First, for each theory we identify and focus on circumstances under which it is most likely to prevail. For instance, the tournament model is studied on a subsample of firms where the CEO position is more likely to be contestable. Second, we evaluate each theory in two ways: 1) by testing how well its prediction is compatible with the estimated compensation contracts of the CEOs and their senior executives, and 2) by examining the predictions of the model with respect to firm performance. A third contribution is that we study an important but neglected class of firms—those that are founded and dominated by family or partners.

We find no support for the tournament model among firms in a sample of Israel firms. It fails to be observed in the implied compensation contracts of firms when the CEO positions are contestable. There is also no relation between the 'prize' of the tournament (the pay differential between CEOs and their senior executives) and firm performance among the contestable firm types. The simple pay equity model is rejected as well. Only the team player model, where rewards are based on team effort (aggregate firm performance) and the emphasis is on cooperations among senior executives, appears consistent with the data. Models that stress cooperation are probably also more reasonable from a multiperiod optimisation point of view. They could lead to more sustainable equilibria in the internal labour market for top executives.

Of special interest are the results on the set of firms that are managed by their owners (family or partners). Here we find that the most appropriate compensation model is the one that would reward CEOs for entrepreneurship, while encouraging team playing behaviour among the senior executives. Our evidence

Table 5

The effect of pay structure on firm's net income.

The table summarises the results of the following three regressions:

(1) Net income = $a_0 + a_1 \ln(\text{TA}) + a_2$ (PayCEO/Pay4) $+ e$
(2) Net income = $b_0 + b_1 \ln(\text{TA}) + b_2$ Pay4 $+ b_3$ (PayCEO/Pay4) $+ e$
(3) Net income = $c_0 + c_1 \ln(\text{TA}) + c_2$ Pay4 $+ c_3$ (PayCEO $-$ Pay4) $+ e$

where Net Income is the firm's 1994 Net Income (in thousands NIS), PayCEO is the top manager's compensation (NIS), and Pay4 is the average compensation of the next four senior executives (in NIS). Below each variable in the table appear its regression coefficient and *t*-statistic (in parentheses). Asterisks (*) indicate the more contestable organisational structure.

		Regression (1)	Regression (2)		Regression (3)	
Subsamples (in dichotomous groups)	No. of obs.	PayCEO/ Pay4	Pay4	PayCEO/ Pay4	Pay4	(PayCEO − Pay4)
Overall sample	367	−433	0.046	1679	0.0438	0.0005
		(−0.25)	(6.12)	(1.02)	(5.58)	(0.11)
1. Non-majority firms*	41	−10127	0.024	−8799	0.0478	−0.0234
		(−1.70)	(1.02)	(−1.45)	(1.85)	(−1.41)
Majority firms	326	763	0.049	3098	0.0438	0.0043
		(0.43)	(6.32)	(1.81)	(5.39)	(0.90)
2. Concern-controlled*	88	−1543	0.126	7145	0.1147	0.127
		(−0.23)	(6.32)	(1.24)	(5.48)	(0.72)
Individuals-controlled	238	2353	0.017	3104	0.0054	0.0137
		(2.93)	(4.25)	(3.90)	(1.37)	(6.39)
3. Subsidiaries of a concern	64	−1977	0.035	455	0.0332	0.0223
		(−0.39)	(1.36)	(0.08)	(1.34)	(0.11)
Joint venture of concerns*	24	−3984	0.192	10651	0.1845	0.0105
		(0.16)	(5.44)	(0.64)	(4.94)	(0.341)
4. Partnership of individuals*	113	1742	0.029	2967	0.0175	0.0141
		(1.45)	(4.05)	(2.54)	(2.45)	(3.18)
Family-controlled	116	3135	0.010	3651	−0.0018	0.0139
		(2.85)	(2.09)	(3.27)	(−0.38)	(5.72)
5. Partnership-manager owner	94	1791	0.027	3110	0.0142	0.0175
		(1.79)	(4.19)	(3.19)	(2.40)	(4.67)
Partnership-manager professional	19	712	0.057	1298	0.0598	−0.0040
		(0.07)	(1.64)	(0.14)	(1.56)	(−0.18)
6. Family-manager owner	98	3554	0.0117	4101	−0.0027	0.0148
		(3.09)	(1.99)	(3.52)	(0.56)	(6.2)
Family-manager professional	18	461	0.019	1082	0.0048	0.0237
		(0.1)	(1.37)	(0.23)	(0.30)	(1.55)

suggests that CEOs who are superior entrepreneurs, i.e., achieve greater performance, are also paid more relative to the senior executives. This last result emphasises the need to examine both the design and the effectiveness aspects of compensation. The high reward in pay level and pay to performance sensitivity for owner-CEOs could be puzzling, unless it could also be demonstrated, as we do here, that in these firms pay differentials also lead to increased performance.

A caveat in this study is that the result may be specific to Israel. For instance, one may argue the need to work together in its nation building effort may carry over to a more cooperative mood of operation among top executives. Thus, it may be worthwhile to study the pay structure in different countries, and make comparisons before a more definitive conclusion could be made about the optimal pay structure among top executives.

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Appendix A

Pay to performance sensitivity of various firm types—estimates from an expanded regression model

The table presents the results of the regression Pay = $\alpha_0 + \alpha_1$ Inc + α_2 ln TA + α_3 AR + α_4 Debt/v + α_5 Industry + e, where PAY = PAY CEO or PAY4 (the average pay of the next four executives); Inc is the 1994 after tax net income of the firm; ln TA is the logarithm of the firm's total assets after orthogonalising to remove the effect of net income; AR is the 1994 abnormal return, from a market model ($R_i - (\alpha_i + B_i R_m)$), and Debt/v is the leverage variable or the sum of over 1 year liabilities to total assets; and Industry is a dummy variable where 1 is for Industrial firms and 0 for all others. The statistical significance is indicated by asterisks (* for 1%, ** for 5%, and *** for 10%).

Compared subsamples (in dichotomous groups)	*n*	Intercept		Net income		Size		Abnormal return	
		PayCEO	Pay4	PayCEO	Pay4	PayCEO	Pay4	PayCEO	Pay4
0. All firms	367	687,749*	345,729*	5,467*	3,083*	124,431*	58,066*	226,246***	58,840
1. Non-majority	41	809,516*	376,388*	2.164*	1.800**	218,675***	73,089*	781,372*	445,703*
Majority	326	642,558*	329,580*	7.125*	3.799*	125,590*	59,511*	70,980	−40,124
2. Concerns owned	88	607,714*	313,056*	5.638*	3.539*	67,467**	38,453	−107,823	−146,706***
Individual owned	236	636,704*	356,369	21.65*	6.236*	180,919*	96,082*	−12,484	−14,058
3. Sole subsidiaries	64	645,518*	306,659*	3.436*	2.528*	88,433*	49,547*	23,600	−133,756
Joint ventures	24	788,044*	363,788*	6.236*	3.741*	160,964**	39,436*	−257,461	−159,683
4. Family controlled	116	579,147*	359,169*	29.34*	6.854*	158,694*	117,312*	158,780	−51,304
Partners controlled	113	725,942*	380,617*	13.83*	5.507*	198,532*	92,353*	151,452	69,872
5. Partnership owner mgr	94	720,832*	377,740*	22.05*	7.927*	215,000*	95,203*	46,812	−1920
Partnership prof mgr	19	951,313*	423,647	4.131***	2.694***	175,763***	85,625*	−288,054	203,031
6. Family owned mgr	98	556,811*	343,771*	32.52*	6.156*	206,498*	135,144*	−224,038	−52,088
Family owned prof mgr	18	669,617*	414,363	19.72***	10.738**	107,846*	83,130	−152,195	56,813

Compared subsamples (in dichotomous groups)	*n*	Leverage		Industry dummy		*R*-squared	
		PayCEO	Pay4	PayCEO	Pay4	PayCEO	Pay4
0. All firms	367	−33,362	−17,161***	−37,097	−2,658	0.280	0.346
1. Non-majority	41	−27,753	−13,810	−62,282	−3,239	0.240	0.430
Majority	326	−38,337	−15,762	−17,024	6,844	0.309	0.382
2. Concerns owned	88	−33,298	−6,794	39,950	56,088	0.459	0.554
Individual owned	236	−48,320	−58,078**	−2,977	−7,844	0.416	0.331
3. Sole subsidiaries	64	−166,044**	−7,244	107,433	40,748	0.281	0.301
Joint ventures	24	−51,805	−5,405	−216,621	30,729	0.635	0.735
4. Family controlled	116	2,162	−63,037	86,273	−360	0.411	0.239
Partners controlled	113	−250,383**	−107,454**	−26,587	−10,853	0.489	0.432
5. Partnership owner mgr	94	−203,656	−90,833	−35,973	−11,063	0.591	0.417
Partnership prof mgr	19	−775,933	−149,711	−117,790	−95,127	0.316	0.664
6. Family owned mgr	98	7,122	−65,791***	142,886	10,338	0.465	0.291
Family owned prof mgr	18	−105,533	−232,580	−91,740	17,643	0.267	0.096