



## Ownership Structure and Firm Performance: Evidence from Israel

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**Abstract.** The study examines the effect of ownership structure on firm performance. We distinguish between family firms, firms controlled by partnerships of individuals, concern controlled firms, and firms where blockholders have less than 50% of the vote. The empirical work analyzes data on 280 Israeli firms and employs the technique of Data Envelopment Analysis. It is found that owner-manager firms are less efficient in generating net income than firms managed by a professional (non-owner) manager, and that family firms run by their owners perform (relatively) the worst. This evidence suggests that the modern form of business organization, namely the open corporation with disperse ownership and non-owner managers, promotes firm performance.

**Key words:** firm performance, ownership structure, family firms, owner-managers

### 1. Introduction

For many years and in many economies, most of the business activity was conducted by proprietorships, partnerships or closed corporations. In these forms of business organization, a small and closely related group of individuals belonging to the same family or cooperating in business for lengthy periods runs the firm and shares its profits.

However, over the recent century, a new form of business organization flourished as non-concentrated-ownership corporations emerged. The modern diverse-ownership corporation has broken the link between the ownership and active management of the firm. Modern corporations are run by professional managers who typically own only a very small fraction of the shares. In addition, ownership is disperse, that is the corporation is owned by and its profits are distributed among many stockholders.

The advantages of the modern corporation are numerous. It relieves financing problems, which enables the firm to assume larger-scale operations and utilize economies of scale. It also facilitates complex-operations allowing the most skilled or expert managers to control business even when they (the professional managers) do not have enough funds to own the firm. Modern corporations raise money (sell common stocks) in the capital markets and assign it to the productive activities of

professional managers. This is why it is plausible to hypothesize that the modern diffuse-ownership corporations perform better than the traditional “closely held” business forms.

Moderating factors exist. For example, closely held firms may issue minority shares to raise capital and expand operations. More importantly, modern corporations face a severe new problem called the agency problem: there is a chance that the professional managers governing the daily operations of the firm would take actions against the best interests of the shareholders. This agency problem stems from the separation of ownership and control in the modern corporation, and it troubled many economists before (e.g., Berle and Means, 1932; Jensen and Meckling, 1976; Fama and Jensen 1983). The conclusion was that there needs to exist a monitoring system or contract, aligning the manager interests and actions with the wealth and welfare of the owners (stockholders).

Agency-type problems exist also in closely held firms because there are always only a few decision makers. However, given the personal ties between the owners and managers in these firms, and given the much closer monitoring, agency problems in closely held firms seem in general less severe.

The presence of agency problems weakens the central thesis that modern open-ownership corporations are more efficient. It is possible that in some business sectors the costs of monitoring and bonding the manager would be excessive. It is also probable that in some cases the advantages of large-scale operations and professional management would be minor and insufficient to outweigh the expected agency costs. Nevertheless, given the historical trend towards disperse-ownership corporations, we maintain the hypothesis that diffuse-ownership firms perform better than closely held firms. In our view, the trend towards diffuse-ownership corporations is rational and can be explained by performance gains.

The paper is organized as follows. Section 2 offers a literature review. Section 3 describes the data. Section 4 presents our methodology based on Data Envelopment Analysis. Section 5 summarizes the results, and Section 6 concludes.

## **2. Ownership Structure and Firm Performance**

One of the most important trademarks of the modern corporation is the separation of ownership and control. Modern corporations are typically run by professional executives who own only a small fraction of the shares.

There is an ongoing debate in the literature on the impact and merit of the separation of ownership and control. Early theorists such as Williamson (1964) propose that non-owner managers prefer their own interests over that of the shareholders. Consequently, non-owner managed firms become less efficient than owner-managed firms.

The more recent literature reexamines this issue and prediction. It points out the existence of mechanisms that moderate the prospects of non-optimal and selfish behavior by the manager. Fama (1980), for example, argues that the availability and

competition in the managerial labor markets reduce the prospects that managers would act irresponsibly. In addition, the presence of outside directors on the board constrains management behavior. Others, like Murphy (1985), suggest that executive compensation packages help align management interests with those of the shareholders by generating a link between management pay and firm performance. Hence, non-owner manager firms are not less efficient than owner-managed firms. Most interestingly, Demsetz and Lehn (1985) conclude that the structure of ownership varies in ways that are consistent with value maximization. That is, diffuse ownership and non-owner managed firms emerge when they are more worthwhile.

The empirical evidence on the issue is mixed (see Short (1994) for a summary). Part of the diverse results can be attributed to the difference across the studies in the criteria for differentiation between owner and non-owner manager controlled firms. These criteria, typically based on percentage ownership by large blockholders, are less innocuous and more problematic than initially believed because, as demonstrated by Morck, Shleifer and Vishny (1988) and McConnell and Servaes (1990), the relation between percentage ownership and firm performance is nonlinear. Further, percent ownership appears insufficient for describing the control structure. Two firms with identical overall percentage ownership by large blockholders are likely to have different control organizations, depending on the identity of the large blockholders.

In this study, we utilize the ownership classification scheme proposed by Ang, Hauser and Lauterbach (1997). This scheme distinguishes between non-owner managed firms, firms controlled by concerns, firms controlled by a family, and firms controlled by a group of individuals (partners). Obviously, the control structure in each of these firm types is different. Thus, some new perspectives on the relation between ownership structure and firm performance might emerge.

### 3. Data

We employ data from a developing economy, Israel, where many forms of business organization coexist. The sample includes 280 public companies traded on the Tel-Aviv Stock Exchange (TASE) during 1994. For each company we collect data on the 1992–1994 net income (profits after tax), 1994 total assets, 1994 equity, 1994 top management remuneration, and 1994 ownership structure. All data is extracted from the companies financial reports except for the classification of firms according to their ownership structure, which is based on the publications, “Holdings of Interested Parties” issued by the Israel Securities Authority, “Meitav Stock Guide,” and “Globes Stock Exchange Yearbook,”

The initial sample included all firms traded on the TASE (about 560 at the time). However, sample size shrunk by half because: 1) according to the Israeli Security Authority (the Israeli counterpart of the US SEC) only 434 companies provided reliable compensation reports; 2) 147 companies have a negative 1992–94 average

net income, which makes them unsuitable for the methodology we employ; and 3) for 7 firms we could not determine the ownership structure.

The companies in the sample represent a rich variety of ownership structures, as illustrated in Figure 1. Nine percent of the firms do not have any majority owner. Among majority owned firms, individuals (family firms or partnerships of individuals) own 72% and the rest are controlled by concerns. About half (49%) of the individually-controlled firms are dominated by a partnership of individuals and the rest (51%) are dominated by families. Professional (non-owner) CEOs are found in about 15% of the individually controlled firms.

#### 4. Methodology: Data Envelopment Analysis

In this study, we measure relative performance using Data Envelopment Analysis (DEA). Data Envelopment Analysis is currently a leading methodology in Operations Research for performance evaluations (see Seiford and Thrall, 1990), and previous versions of it have been used in Finance (by Elyasiani and Mehdiian, 1992, for example).

The main advantage of Data Envelopment Analysis is that it is a parameter-free approach. For each analyzed firm, DEA constructs a “twin” comparable virtual firm consisting of a portfolio of other sample firms. Then, the relative performance of the firm can be determined. Other quantitative techniques such as regression analysis are parametric, that is it estimates a “production function” and assesses each firm performance according to its residual relative to the fitted fixed parameters economy-wide production function. We are not claiming that parametric methods are inadequate. Rather, we attempt a different and perhaps more flexible methodology, and compare its results to the standard regression methodology findings.

Data Envelopment Analysis presents and solves the following linear programming problem for each firm:

$$\begin{aligned}
 & \text{Max} \quad \beta \\
 & \text{s.t.} \quad \sum_{i=1}^n \lambda_i X_{ik} \leq X_{0k} \quad k = 1 \dots s \\
 & \quad \quad \sum_{i=1}^n \lambda_i Y_{ip} \geq \beta Y_{0p} \quad p = 1 \dots r \\
 & \quad \quad \sum_i \lambda_i = 1; \quad \lambda_i \geq 0; \quad \beta \geq 1
 \end{aligned}$$

where  $n$  is the number of firms in the sample,  $s$  is the number of inputs that the analyzed firm (firm 0) uses, and  $r$  is the number of outputs it produces.

This LP problem seeks to generate for each existing firm a comparable optimal virtual firm. The optimal firm is constructed as linear combinations of existing

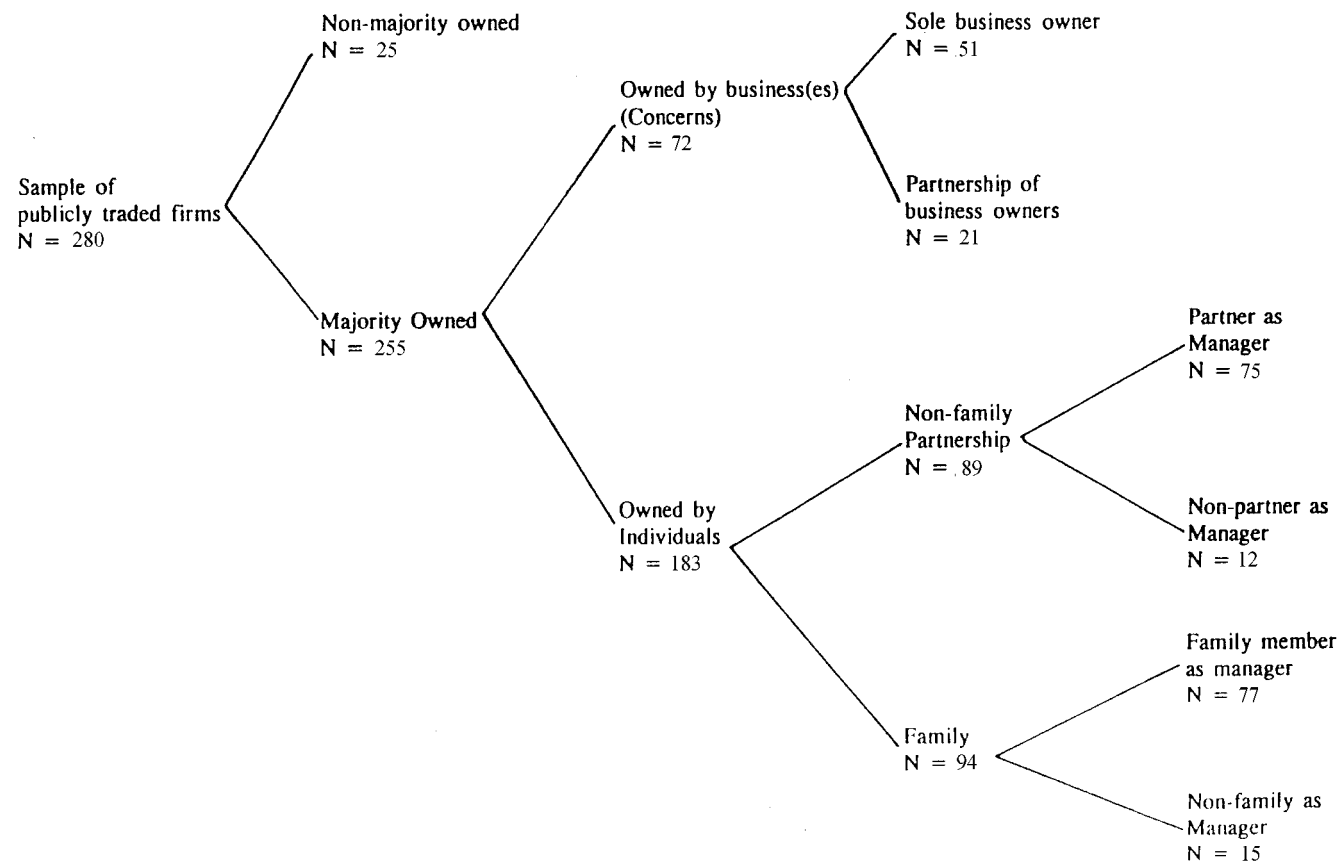


Figure 1. A classification of the sample of publicly traded Israeli firms by ownership structure. The firms are classified into a 2 (majority versus non-majority) × 2 (business/concern owned versus individual owners) × 4 (sole versus partnership of business concerns; non-family versus family) × 4 (non-family,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

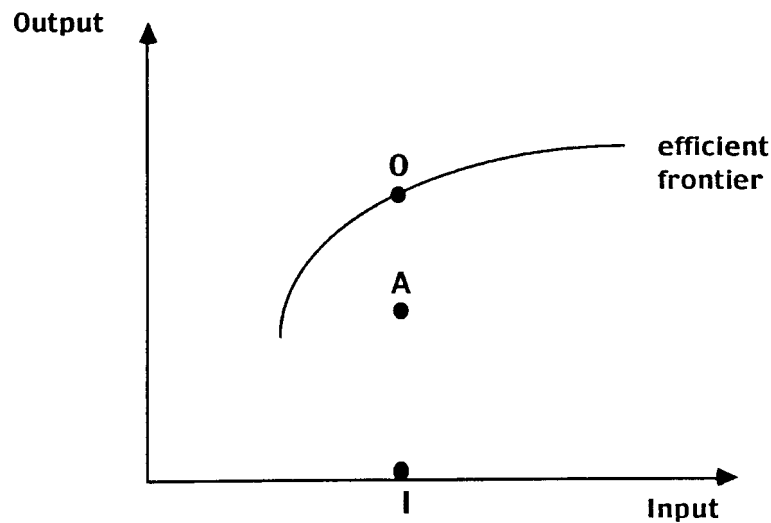


Figure 2. The efficient frontier of a set of firms.

actual firms. Its output is higher or equal to that of the actual firm it is compared to, yet its inputs are lower or equal to that of the respective actual firm.

The first restriction above ensures that the inputs of the virtual firm will not exceed the current inputs of the actual firm it is compared to. The second restriction assures that outputs of the virtual firm will not be less than that of the comparable actual firm. The third restriction illustrates or constrains the virtual firm to be a portfolio of existing firms with weights between zero and one. Lastly, the combination of the objective function and second restriction assures that the virtual firm would be optimal in the sense that the virtual firm would maximize outputs given the inputs or scale of the actual firm it is compared to.

After constructing a virtual firm for each actual firm, an efficient frontier can be drawn (see Figure 2) and a performance score can be computed. The performance of firm A is approximated by the ratio of its output and the respective virtual firm output ( $IA/IO$  in Figure 2). This ratio measures how much of its optimal output the firm currently produces, taking as given the firm current inputs (or resources). It is noteworthy that a firm can have a performance score of 1. This is the case when the firm is so profitable that the optimal virtual firm consists of this firm only (see Seiford and Thrall (1990) for details).

The practical application of the DEA to our sample proceeds as follows. We define one output variable, the 1992–94 net income of the company, and four input factors: total firm assets, the ratio of equity to total assets, CEO pay, and the pay of the other four top managers.

The choice of net income (profits after tax) as the output variable by which the firm is judged follows the tradition of economists to view maximizing profits as

the firm's goal. In this study, we examine the bottom-line economic performance of the firm. Hence, an output measure like net income appears natural.

The use of total assets as an input variable controls for the size effect (larger firms typically have higher net income than small firms). The equity ratio variable represents expectation that given the firm size, the higher the investments of stockholders (equity), the higher their return (net income). Finally, the CEO and top management compensation variables are controlling for the managers' input. One of our central points is that top managers' actions and skills affect firm output. Hence, higher pay managers (who presumably are also higher-skill) are expected to yield superior profits. Rosen (1982) relates executives' pay and rank in the organization to their skills and abilities, and Murphy (1998) discusses in detail the structure of executive pay and its relation to firm's performance.

The DEA analysis and the empirical estimation of the relative performance of different organizational forms are repeated in four separate subsets of firms: Investment companies, Industrial companies, Real-estate companies, and Trade and services companies. This sector analysis controls for the special business environment of the firms and facilitates further examination of the net effect of ownership structure on firm performance.

## 5. Empirical Results

### 5.1. AN OVERVIEW

Table I presents means, medians, standard deviations, and minimal and maximal values of the variables examined. The average total assets of the firms in the sample is 561 million NIS (where 3 NIS = 1 US Dollar), and common stocks comprise about 52% of total assets. CEO mean compensation is 722 thousand NIS, and the next four top executives earn 376 thousand NIS on average. The average yearly net income of the firms in 1992–94 is 13.7 million NIS.

Table II reports means of our computed performance scores for the overall sample as well as for the following firm types: (1) firms with diffuse ownership where no individual or small group has a majority of votes; (2) firms controlled by business concerns; (3) firms controlled by a partnership (joint venture) of several business concerns; (4) firms with majority vote in the hands of a single individual or family; and (5) firms where a small group of individuals (partners) has the majority vote. Interestingly, partnership of individuals and family-controlled firms are found to be least efficient in generating net income. However, when the business sector of the firm is accounted for, i.e. when performance scores are estimated relatively to other firms in the sector, only family firms appear as poor performers relative to the rest of the firms.

Another way to gain perspective on the relation of ownership structure and performance is to compare performance scores along the organizational-type tree depicted in Figure 1. Table III reports the results. Significant differences are found between firms with and without a majority control group, between firms with

Table I. Descriptive statistics for the sample of 280 Israeli firms<sup>a</sup>

Variables	Mean	Median	Standard deviation	Minimum	Maximum
Total assets	561,122	75,953	1,730,152	12,176	16,498,830
Average yearly net income in 1992–94	13,667	3,064	37,154	61	411,279
CEO pay	722.0	593.7	496.4	145.0	4,080.0
Average pay of the next 4 top executives	375.9	321.5	224.0	121.1	1,620.0
Leverage (debt/total assets)	0.48	0.46	0.24	0.00	0.99

<sup>a</sup> All statistics are in thousand New Israeli Shekels (NIS) except for leverage which is a pure number. The data are collected from the 1994 company reports. Average exchange rate in 1994 is \$1  $\simeq$  3 NIS.

Table II. Performance scores of firms: The effect of ownership structure<sup>a</sup>

Ownership structure	Average performance in % relative to the efficient frontier of	
	All firms	Firms in the same sector
Non-majority firms	47.0	56.7
Concern-controlled firms	43.1	50.8
Firms controlled by partnerships of concerns	41.8	55.1
Firms controlled by partnerships of individuals	33.1	53.8
Family-controlled firms	27.8	44.3

<sup>a</sup> Performance scores are estimated based on the firm's net income, and using Data Envelopment Analysis (see Section 4).

majority holdings depending on whether control is in the hands of a business concern or a few individuals, and between owner and non-owner manager firms.

In Table III, non-majority firms perform significantly better than majority owned firms (47% vs. 33.9%, respectively). However, not all majority-controlled firms lag behind. Firms controlled by concerns and joint ventures of concerns have a performance score above 40% too. This suggests that companies owned by concerns do not face the same restrictions or problems as individually owned firms.

One of the possible explanations for the concern-owned superiority over other majority-owned firms is that concern-owned firms are run by professional managers who can probably promote performance. The last pairwise comparison in Table III supports this contention by showing a significant performance



*Table III.* The effect of ownership structure on firm performance: Pairwise comparisons. The pairwise comparisons follow the ownership classification tree outlined in Figure 1, and significant pairwise differences are marked with an “\*\*”. Performance is estimated based on the firm’s net income

Compared types of ownership structure	Number of observations	Average performance in % relative to the efficient frontier of	
		All firms	Firms in the same sector
Majority firms	255	33.9*	49.7
Non-majority firms	25	47.0	56.7
Firms controlled by individuals	183	30.5*	48.8
Concern controlled by firms	72	42.7	52.2
Sole concern owner	51	43.1	50.8
Partnership of concerns	21	41.8	55.1
Family firms	94	27.8	44.3
Partnership of individuals	89	33.3	53.8
Partnership with an owner manager	75	33.2	53.6
Partnership with a professional manager	12	34.2	58.4
Family firms with an owner manager	77	25.0	40.8
Family firms with a professional manager	15	34.0	55.5
Owner manager firms	152	29.8*	47.5
Non-owner manager firms	124	41.7	54.3

advantage of non-owner managed firms (average performance score of 41.7%) over owner-manager firms (average performance score of 29.8%).

Replicating the pairwise comparisons using sector-adjusted performance scores somewhat blurs the previous results. In the sector-controlled column of Table III, none of the pairwise differences is statistically significant (at the 5% level). Nevertheless, the phenomena identified in the overall sample remain: majority-owned firms perform worse than disperse-ownership firms, individually-controlled firms perform worse than concern-controlled firms, and owner manager firms perform worse than professional-manager firms.

An overview of the sector-adjusted performance scores reveals that most forms of organizational structures score on average above 50%. The only exception is the subsample of family controlled firms that are managed by their owners and achieve a relatively low performance score of 40.8%.

## 5.2. THE EFFECTS OF NON-OWNER MANAGERS AND OF MAJORITY CONTROL BY INDIVIDUALS

The main results of the empirical findings reviewed above are that majority control by a few individuals diminishes firm performance, and that professional non-owner managers promote performance. To further examine these preliminary conclusions, we run regressions of PERF, the performance scores, on: a) INDIV – a dummy variable equal to 1 when the firm is controlled by a family or a partnership of few individuals; b) PROFDUM – a dummy variable equal to 1 when the firm Chief Executive Officer is a professional non-owner manager; c) LEV – the firm's leverage or debt ratio; and d) SIZE – the firm's total assets. The last two variables are added for error-control purposes. It is possible that the DEA performance scores that take into account firm size and leverage (see the Methodology section) do not purge out completely these effects. Hence, leverage and size are added to the regression.

The regression results are reported in Table IV. There are two main findings. First, the coefficients of SIZE and LEV are positive and statistically significant (at the 1% level). It appears that larger and more leveraged firms achieve higher performance scores. Second, the coefficient of PROFDUM is positive and statistically significant, and the coefficient of INDIV is negative and sometimes statistically significant. Evidently, professional management increases the firm's relative performance, and control by a few individuals tends to diminish performance.

The conclusions about individual control and professional management are reinforced by two other findings. First, it appears that firms without professional managers and firms controlled by individuals are more likely to exhibit negative net income. The proportion of individuals-controlled firms omitted from the DEA analysis due to negative net income, 35.8%, is larger than the proportion of negative net income firms in the rest of the sample, 29.2%. Similarly, 35% (32%) of the firms with an owner-manager (non-owner professional manager, respectively) were omitted due to negative net income. These differences in proportions are, however, statistically insignificant.

Second, Table IV also presents results of regressions of net income, NET INC, on leverage, size, professional manager dummy, and individual control dummy. The results are similar to those of the performance score regressions. The coefficients of size, leverage, and professional-manager dummy are positive and statistically significant (at the 5% level), while the coefficient of the control by individuals dummy is negative and statistically significant. Again, it appears that professional non-owner management increases net income, while individual control by a family or a partnership of individuals decreases net income.

An interesting observation is that the explanatory power of our four variables (size, leverage, and the two control-structure dummies) is higher in the net income regression (see Table IV). The adjusted  $R^2$ 's of the net income and performance

*Table IV.* The effect of majority control by individuals and of owner-managers on firm performance. The table presents results of regressions of PERF, the performance score (in %), and NET INC, net income (in thousands of NIS), on: INDIV, a dummy variable equal to 1 when the firm is controlled by a family or partnership of few individuals; PROFDUM, a dummy variable equal to 1 when the firm's Chief Executive Officer is a professional non-owner manager; LEV, the firm's leverage or debt ratio, and SIZE, the firm's total assets (in thousands NIS). The regressions are run in the overall sample of 280 firms, and significance levels (*p*-values) are shown in parentheses below the coefficients

Dependent variable	Coefficient of				Adjusted-R <sup>2</sup>
	SIZE	LEV	INDIV	PROFDUM	
PERF	8.3·10 <sup>-6</sup> (0.001)	28.7 (0.001)			0.15
PERF			-10.8 (0.004)	16.4 (0.001)	0.10
PERF	6.4·10 <sup>-6</sup> (0.003)	29.3 (0.002)	-5.2 (0.15)	14.6 (0.001)	0.20
NET INC	0.035 (0.001)	12388 (0.006)			0.79
NET INC			-24581 (0.001)	12587 (0.009)	0.12
NET INC	0.034 (0.001)	12603 (0.005)	-4477 (0.02)	2824 (0.03)	0.83

score regressions are 0.83 and 0.20, respectively. This is not surprising. Size and leverage strongly and directly affect net income. However, performance scores, by their construction as ratios of net incomes, are less sensitive to size and leverage. (Recall that the performance score is defined as the ratio of firm's net income to an "almost identical inputs" virtual optimal firm net income.)

The similarity of the net income regression conclusions and the non-parametric DEA methodology performance score conclusions suggests that DEA does not generate bizarre results. Nevertheless, given its complexity, not much was gained by the DEA application in our study. Perhaps future studies can identify some specific unique contributions and insights offered by DEA.

## 6. Conclusions

The empirical analysis of 280 firms in Israel reveals that ownership structure impacts firm performance, where performance is estimated as the actual net income of the firm divided by the optimal net income given the firm's inputs. We find that:

1. Out of all organizational forms, family owner-managed firms appear least efficient in generating profits. When all firms are considered, only family firms with owner managers have an average performance score of less than 30%, and when performance is measured relative to the business sector, only family firms with owner-managers have an average score of less than 50%.
2. Non-owner managed firms perform better than owner-managed firms.

These findings suggest that the modern form of business organization, namely the open corporation with disperse ownership and non-owner managers, promotes performance.

Critical readers may wonder how come “efficient” and “less-efficient” organizational structures coexist. The answer is that we probably do not document a long-term equilibrium situation. The lower-performing family (and partnership-controlled) firms are likely, as time progresses, to transform into public-controlled non-majority owned corporations.

A few reservations are in order. First, we do not contend that every company would gain by transforming into a disperse ownership public firm. For example, it is clear that start-up companies are usually better off when they are closely held. Second, there remain questions about the methodology and its application (Data Envelopment Analysis is not standard in Finance). Last, we did not show directly that transforming into a disperse ownership public firm improves performances. Future research should further explore any performance gains from the separation of ownership and control.

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