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THE RELATIONSHIP BETWEEN BOARD COMPOSITION  
AND COMPANY PERFORMANCE

A Snapshot on Finnish Listed Companies from 2000

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## **The Relationship between Board Composition and Company Performance**

- Objectives** The main objective of this study is to explore the relationship between board composition and company performance. Levels of board independence, size of the board and director ownership variables are used to explain firm performance. Secondary objectives are to explore the effects of both the business environment and the ownership and governance structures on board size and level of independence.
- Data** The sample group includes 67 companies, from 11 industries, listed on the main list or the I-list at the Helsinki Exchanges. The data is manually collected from published annual reports for fiscal year that ended 31.12.2000. The data is also supplemented by personal correspondence with the companies. Additionally, some ownership information is obtained from Arvopaperikeskus (The Finnish Central Depository). Also, figures on ownership type are taken from the study by Karhunen & Keloharju (2000). The time frame in this study is one year (2000).
- Methods** Company performance is defined by two approaches: accounting based Return on Assets and stock market based Market Valuation multiple (a crude approximation for Tobin's q). The study is carried out using OLS linear regression with multiple variables. Some of the hypothesized relationships are curvilinear (such as the level of independence) or cubic (insider director ownership) in nature and for these variables a piecewise regression approach is chosen. In all regressions a set of control variables (industry, size of the company, growth opportunities) is included to separate the effect of external factors on the studied relationships.
- Results** The results indicate that board composition in terms of level of independence, board size, or director ownership do not affect the company performance. These findings are similar with both performance measures, which indicates that they are robust. In addition, the result on the impact of board independence on company performance is in line with findings from previous international studies. However, results on the effects of board size and director ownership on company performance are contradictory to previous international studies. For example, the impact of board size on company performance for small unlisted companies in Finland has already been established by Eisenberg et al. (1998). On the other hand, Renfors (2000) finds that in Finland there is no relationship between managerial ownership and firm performance.
- The hypothesized relationship between board size and independence, number of large shareholders, domestic institutional shareholdings, and insider director ownership does exist and is statistically significant. In addition, the level of board independence is affected by insider director ownership, growth opportunities, and total shareholdings by large shareholders, as hypothesized.
- Key Words** Agency Problem, Corporate Governance, Board of Directors, Board Composition, Ownership Structure, Company Performance

**Hallituksen koostumuksen vaikutus yrityksen menestykseen**

- Tavoitteet** Tutkimuksen pääasiallinen tavoite on tutkia hallituksen koostumuksen vaikutusta yrityksen menestyksen. Menestystä pyritään selittämään erilaisilla hallituksen riippumattomuuteen, kokoon ja hallituksen jäsenten omistukseen liittyvillä muuttujilla. Lisäksi toissijaisena tavoitteena on tutkia millaiset liiketoimintaympäristöön, omistusrakenteeseen ja hallinnon järjestämiseen liittyvät tekijät vaikuttavat hallituksen kokoon ja riippumattomuuteen.
- Aineisto** Lähdeaineisto koostuu 67 yrityksestä, 11 eri toimialalta, jotka ovat julkisenkaupankäynnin kohteina Helsingin Pörssin pää- tai I-listoilla. Materiaalina on yritysten tilikautta 2000 koskevat vuosikertomukset. Joidenkin yritysten puuttuvia tietoja olen täydentänyt informaatiolla, jonka olen saanut yrityksiltä henkilökohtaisen yhteydenpidon kautta. Hallitusten jäsenten omistuksia olen lisäksi tarkastanut Arvopaperikeskuksen sisäpiirirekisteristä. Lisäksi olen ottanut yritysten omistajatyyppeihin liittyviä muuttujia suomalaisten osakesijoituksia käsitelleestä Karhusen ja Keloharjun (2000) tutkimuksesta.
- Menetelmät** Yrityksen menestyksen olen määritellyt kahden muuttujan kautta: tilinpäätöspohjaisen pääoman tuottoasteen (ROA) ja osakemarkkinapohjaisen markkina-arvokertoimen (joka on karkea approksimaatio Tobinin  $q$ :lle). Yrityksen menestystä selitän lineaarisella OLS-monimuuttujaregressiolla. Koska joidenkin muuttujien välinen suhde ei ole lineaarinen vaan muistuttaa toisen tai kolmannen asteen polynomia, olen tehnyt muuttujista lineaarisia osamuunnoksia (ns. piecewise linear regression), jotka mahdollistavat tavanomaisen lineaarisen regression käytön. Lisäksi käytän kaikissa regressioissa kontrollimuuttujia (esim. toimiala, yrityksen koko ja kasvunäkymät), joiden avulla voin eristää ulkopuolisten tekijöiden vaikutuksen.
- Tulokset** Hallituksen riippumattomuudella, koolla tai hallituksen jäsenten omistuksella ei vaikuta olevan vaikutusta yrityksen menestykseen. Tulokset ovat samansisältöiset menestyksen mittaustavasta riippumatta ja ne ovat linjassa viimeisimpien kansainvälisten tutkimusten kanssa riippumattomuuden osalta. Muilta osin tulokset ovat ristiriidassa kansainvälisten tutkimusten kanssa, sillä esimerkiksi hallituksen koolla ja menestyksellä on havaittu selkeä negatiivinen yhteys. Tämä ilmiö on raportoitu myös suomalaisilla PK-yrityksillä (Eisenberg et al., 1998). Toisaalta esimerkiksi Renfors (2000) ei löydä yhteyttä johdon omistuksen ja yrityksen menestyksen väliltä. Hänen lähdeaineistonsa on hyvin samanlainen kuin tässä tutkimuksessa, joten tulokseni tukevat hänen havaintojaan.
- Sen sijaan riippumattomuudella, suurten osakkeenomistajien lukumäärällä, kotimaisten institutionaalisten sijoitusten ja yrityksen johtoon kuuluvien hallituksen jäsenten osakeomistuksella on selkeä ja tilastollisesti merkittävä vaikutus hallituksen kokoon. Lisäksi hallituksen riippumattomuuteen vaikuttavat suurten osakkeenomistajien omistusosuudet, yrityksen kasvuodotukset ja yrityksen johtoon kuuluvien hallituksen jäsenten osakeomistukset.
- Avainsanat** Agenttiongelman, yrityksen hallinto, hallitus, hallituksen koostumus, omistusrakenne, yrityksen menestys

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# 1 INTRODUCTION

## 1.1 OVERVIEW

The board of directors (henceforth referred to as 'the board') plays a central role in the corporate governance. Thus it is important to understand the relationship between company performance and composition of the board. According to the Finnish Company Act, the primary purpose of the board is to monitor company's management to ensure that all actions are in the best interests of its shareholders. However, the board can also have other functions in addition to monitoring. At best, the board can offer fresh ideas to the management and contribute to the strategic planning process (Hirvonen et al., 1997). Furthermore, board meetings can be a forum for the management to present their visions and test them on a group of people that has strong business acumen. In addition, board members commonly serve as high ranking corporate officers in other companies thus offering the company a vast network of contacts (Hallock, 1997).

In Finland the issues involving corporate governance, such as board's ability to monitor management, have surfaced quite recently. Several factors have contributed to this development including the major accounting scandals (Enron as the most cited example), increased emphasis on shareholder value and shareholder activism by major institutional investors (including the Finnish government). Consequently, corporate governance has become a major topic in newspapers during spring 2003<sup>1</sup>. It is also an area that has been studied extensively<sup>2</sup>, because the

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<sup>1</sup> Major issues include the abolishment of Finnair's supervisory board, the dramatic change of board of directors in VR, director shareholdings, and the concentrated ownership in small listed companies. See for example Aamulehti (4.4.2003), Helsingin Sanomat (4.4.2003), Kansanuutiset (2.4.2003) or Taloussanomat (6.5.2003 and 7.5.2003).

<sup>2</sup> As illustration see studies from Agrawal & Knoeber, Bhagat & Black, Brickley et al., Cotter et al., Gibson, Hallock, Klein, Rosenstein & Wyatt, Shivdasani, and Yermack

results are in the interest of executives, investors and academics alike. The practical implications from these studies help management develop the governance structures that drive performance and increase shareholder wealth. In addition, the results give investors and analysts tools to screen out companies – which are best equipped to succeed – from the vast variety of investment opportunities. Furthermore, these studies shed more light on the interaction between the management and the board. Consequently they can offer new explanations for practices that cannot be accounted for by the existing theoretical framework.

## **1.2 OBJECTIVE OF THE STUDY**

The purpose of this thesis is to explore the board composition of Finnish listed companies and to investigate the relationship between the board and the company performance. Special areas of interest are the characteristics of the board and the chosen forms of corporate governance. Additionally, also forces that drive the board composition will be studied to investigate the links between various forms of corporate governance. These factors include for example the size of the board and the level of board independence.

The relationship between the board and company performance has been in the interests of several scholars, but they have mostly been done in the US, using US data, and it is not certain that the findings of these studies also apply in Finland. This thesis has three contributions. First, it is the first study in Finland linking board composition and company performance for larger listed companies. Eisenberg, Sundgren and Wells (1998) studied the relationship between board size and company performance for small non-listed companies. Second, this study also examines the reasons behind the chosen form of governance through analysis of relationships between board characteristics and ownership base. Finally, this thesis increases our understanding of corporate

governance in Finnish listed companies by investigating and exploring the characteristics of the boards of Finnish listed companies and by potentially filling gaps left in the previous theses in this area (cf. Renfors, 2000 and Tukia, 2001).

### **1.3 DATA AND METHODS APPLIED IN THE STUDY**

The data used in this study consists of 67 companies that are listed on the main list or on the Investor list of Helsinki Exchanges (HEX). The companies represent 11 different industries.

The firm performance is defined using two different approaches: Return on Assets (ROA) and Market Valuation (a crude approximation for Tobin's q). The study is carried out using regression analysis with the measured performance explained by three key variables:

**1. Degree of board independence**, measured as proportion of directors that are independent as oppose to directors that are insiders (i.e. work for the company) or belong to neither group (being either relatives of insiders or former employees of the company, referred in these studies as gray directors)

**2. Board size**

**3. Level of director ownership**, measured separately for independent directors and insider directors as percentage of shares controlled by these two groups

In turn board size and independence are explained by ownership structure and operational factors:

- 1. Ownership structure:**
  - Number of large shareholders holding more than 5% of shares
  - Total holdings by these large shareholders
  - Percentage of shares owned by Finnish individual investors
  - Percentage of shares owned by Finnish institutional investors
- 2. Operational factors:**
  - Industry the company operates in
  - Growth opportunities
  - Size of the company

## **1.4 SUMMARY OF KEY RESULTS**

In Finland there is no relationship between company performance and board composition in terms of level of independence, board size or director ownership. This result is robust across the two performance metrics used.

However, there is a clear and statistically significant link between board size and ownership and business environment variables. The number of large shareholders and low levels of insider director ownership also lead to larger boards. However, at high levels of insider director ownership the relationship is reversed. Also higher proportion of insiders and high domestic institutional ownership leads to smaller boards. Furthermore, industry and size of company also have impact on the size of the board.

In addition, there is also a significant relationship between chosen level of board independence and ownership structure. Insider director ownership has negative impact on independence at low and high levels of ownership and positive effect on moderate levels of ownership. The total shareholdings by the large shareholders have a positive effect on independence.

## **1.5 STRUCTURE OF THE RESEARCH PAPER**

The paper is organized so that the theoretical framework for the study is presented in the second chapter. In the third chapter previous studies in this area are reviewed. The fourth chapter presents my research hypotheses. The fifth chapter is dedicated to discussion on data and research methodology. The sixth chapter describes the characteristics of Finnish boards and presents the results from the regressions. Final chapter concludes the thesis and also presents some ideas for future studies in this field.

## 2 BACKGROUND FOR THE STUDY

One character of modern corporations is the separation of ownership and control (Berle and Means, 1932). The widely dispersed ownership renders the shareholders unable to run the company themselves and consequently, the owners hire a professional manager to run the daily operations. However, the shareholders retain the final decision-making authority through Annual General Meeting (AGM), which also establishes a group of shareholder representatives (i.e. the board) to monitor the work of the managers. The relationship between the owners and managers is defined by a contract. The contract is imperfect, because all possible situations cannot be decided upon beforehand. The principals (owners) can only monitor the outcome of the work, without the possibility to determine whether it was a result of agents' (managers) work or some external factor. On the other hand, the manager is uncertain about the effect of external influences on the outcome. It is this asymmetry of information and the uncertainty of outcome that cause a conflict between the principal and the agent through misalignment of interests between the principals and the owners. This dilemma is commonly referred to as **the agency conflict**. (Shleifer and Vishny, 1997)

The pressure that the managers obtain from other stakeholders of the company emphasizes the conflict between owners and managers. In fact, Donaldson and Lorsch (1983) suggested that managers represent three groups of stakeholders: investors (both creditors and shareholders), employees and business associates (customers and suppliers). In addition, managers also have their own interests at heart.

The remaining chapter is organized in the following way. First section categorizes the agency conflict and describes some manifestations of these problems. Second section lists the potential control mechanisms for agency problems and third section explores the board as a control mechanism.

## **2.1 AGENCY PROBLEMS**

Byrd et al. (1998) divide the agency problems into four categories: i) effort, ii) time horizon, iii) risk preferences, and iv) asset use. I will present each of these categories individually and also present some manifestations of these problems.

### **2.1.1 Managerial Effort**

Labor economists argue that managers trade off income for leisure by working until the marginal utility from leisure equals the marginal cost of forgone income. Therefore, a manager that works long hours has a considerable incentive to exchange some of the working hours into leisure time even if it means lower income for example in terms of lost bonuses. (Byrd et al., 1998)

In the seminal paper by Jensen and Meckling (1976), the authors find that the smaller the fraction of the firm the manager owns, the greater the manager's incentive to shirk. There is very limited empirical evidence in this area because the level of CEO effort and the level of shirking are very difficult to determine. However, Rosenstein and Wyatt (1997) find that stock prices of US firms tend to decrease after an announcement that an executive has accepted a board seat at another company. If managerial time is viewed as a constant, then the time spent on monitoring the

another company is deprived from the company of employment. This evidence is consistent with the theoretical framework. However, “the fundamental shareholder-manager agency problem is not getting the CEO to work harder, but rather getting him to choose actions that increase rather than decrease shareholder value” (Murphy, 1998, 28).

### **2.1.2 Shareholder vs. Manager – Time Horizon**

The time horizons of managers and owners are different. Shareholders are indifferent on the payback time of an investment as long as the Net Present Value (NPV) is positive. However, the managers are short sighted and they realize that they will work for the company for a limited time. (Narayanan, 1985) Thus, managers might choose projects that have lower NPV but have a short payback period. Commonly cited example is the R&D expenditure, which has a very long payback time. Cutting R&D costs can boost the profits in the short-run, allowing the manager to achieve private benefits. Dechow and Sloan (1991) and Murphy and Zimmerman (1993) find evidence that R&D investments decline as time before CEO retirement decreases.

### **2.1.3 Differential Risk Preference**

Shareholders and managers have differing opinions on risk. The shareholders are risk neutral, because by diversification they eliminate the firm-specific risk from their portfolio. Managers have their livelihood (i.e. future earnings) tied to the company as well as possible stock holdings. Furthermore, the specific skills that the manager possesses might be company – or at least industry – specific and thus efficient diversification is impossible.

The managerial risk aversion induces the managers to choose actions that reduce the company specific risk, such as diversify into several businesses or choose sub-optimal projects that have low risks. As shareholders can diversify their portfolios easily and at low cost, there is no need for corporate diversification. There is rather conclusive evidence (Lang and Shulz, 1994; Comment and Jarrell, 1994; and Berger and Ofek, 1994; to name but a few) that the returns of diversified companies are lower than those of focused firms in the same industry, and furthermore, that the returns decrease as a function of diversification level. In addition, Berger and Ofek (1996) find that the probability that a company will be taken over increases by the level of value loss from diversification.

#### **2.1.4 Asset Use Problem**

The managers control the assets of the company, which may induce them to use company funds and resources for their own personal benefit. Naturally the stockholders pay the bill for these activities. This phenomenon is referred to as the asset use problem. It can take several forms ranging from excessive perk consumption to pet projects and empire building.

Excessive perk consumption can include use of a company jet and company car (equipped with personal driver) for personal benefit, executive dining rooms, or extravagant recreational properties in holiday resorts for management use. Pet projects would be investments into industries that are not the core competence of the company, but where the manager has special knowledge that makes him irreplaceable (Shleifer and Vishny, 1989).

Empire building refers to expansion into several industries with growth, not profitability, as the key driver. As a CEO of a large company, the manager can have prestige and personal benefits (such as higher pay). In Fact, Murphy (1985) finds evidence that firm size explains larger percentage of cross-sectional variation of top manager pay than firm performance. Jensen (1986) argues that the potential for overinvestment is at highest in companies with poor investment opportunities and excess cash. Jensen's hypothesis is supported by Lang, Stulz and Walkling (1991), who find that the bidder returns are the lowest among firms with low Tobin's q's and high cash flows. Furthermore, Kaplan (1989) finds evidence that suggests overinvestment before a management buyout.

The magnitude of the asset use problem is virtually impossible to determine. Moderate use of executive perks is common, but there are also some instances where things have gotten out of hand. Most noteworthy example of empire building and lavish perk consumption is the best-selling account of the RJR-Nabisco transaction titled *Barbarians at the Gate*.

## **2.2 AGENCY PROBLEM CONTROL MECHANISMS**

The agency problem control mechanisms can be divided into those that affect the input of decision-making process and those that examine the output. Incentives are used to link the wealth of the managers with wealth of the owners, so that managers act in the best interest of shareholders. Monitoring mechanisms are used to observe the output of managerial decisions, which means that the system is inherently backward looking. The various control mechanisms are shown in the following table 2.1.

Table 2.1: The control mechanisms for agency problems and their explanations according to Byrd et al. (1998).

	Mechanism	Explanation
Incentives	Stock Holdings	Managers are also owners.
	Incentive Schemes	Linking the wealth of shareholders to wealth of managers.
Monitoring	Board of Directors	Monitor managers and make sure that the interests of the shareholders are followed.
	Labor Market	Managers with good reputation have more career opportunities (=higher pay).
	Market for Control	Agency costs reduce the market value of the company. In case of a takeover the management is usually laid off.
	Major Shareholders	Large shareholders have larger incentive to monitor the management, they have more resources for monitoring, and their views carry a lot of weight.
	Dividends and Debt	Payment of dividends reduces the manager's power to decide on the use of the funds. Debt forces the managers to be efficient to avoid bankruptcy.

This paper obviously focuses on functioning of the board as a monitoring mechanism for agency problem. However, major shareholders and managerial ownership also play a central role when board composition is explored. Additionally, also other control mechanisms are discussed at times to ensure a thorough treatment of the topic. For further information on the topic see for example Byrd et al. (1998).

## **2.3 BOARD OF DIRECTORS**

This section is divided into three parts. First part discusses the role and functions of the board. Second part is focused on addressing key attributes of good director and the third part introduces some concepts related to incentives of the board members. In addition to presenting the functions of the board the purpose of this section is also to highlight the potential problems associated with this form of governance.

### **2.3.1 Functions of the Board**

According to the Finnish Company Act, the board of directors monitors the actions that the managers take to ensure that they act in the best interest of the shareholders. The scope of this monitoring ranges from choosing the right projects to avoiding outright fraud or embezzlement. The Company Act was designed to ensure that rights of investors, and especially minority shareholders, are protected. The legislation focuses entirely on the role of the board as the shareholders' instrument for monitor the management and protecting their investment in the company.

In order to carry out the monitoring responsibility, the board meets regularly to discuss issues that arise in the normal course of business. According to Hirvonen et al. (1998) the Finnish boards meet approximately 10 times per year, including meetings with a specific theme (usually annually 1 to 4) such as budget or audit meeting. In addition, the board often (26%) consists of several committees that are responsible for a particular board task. These committees include for example compensation committee (24%) or audit committee (31%).

In addition to continuous monitoring, the board also has several discrete tasks that it is responsible for. In all companies they include appointment and dismissal of top-management (especially 'chief executive officer', CEO), setting the level of executive pay, and nominating future directors.

In addition to purely monitoring of the management, the board also commonly participates on actual decision-making and business development. According to Hirvonen et al. (1998) the board usually takes part in organizational development (87%), budgeting (93%), or performance reporting (85%). Furthermore, the board decides on issues related to large-scale investment (97%) or strategic maneuvers (93%). This implies that board is not only passive monitoring organ, but also an active player in the key decisions that shape the organizations and decide their performance in the long-run.

### **2.3.2 Requirements for a Director**

When considering the monitoring tasks of the board it becomes apparent that one of the key attributes for a director is independence from the management in order to guarantee the objectivity needed for credible monitoring. The directors can be categorized into three groups by their independence from the management (insiders, gray, and independent). Those directors who also serve as executives in the company are regarded as insiders. Gray directors are former employees of the company or the relatives of the current executives. The remaining directors are independent. In this thesis I will also follow this approach.

However, in modern corporate governance literature the board is seen on a larger perspective as a strategic resource that not only represents the owners but also acts a discussion partner for

management and brings variety of skills and resources for the key decisions. These new functions that are imposed on the board, have dramatically changed the role of board. Consequently the requirements for the directors in terms of understanding the industry and company strategy have also changed.

In order to understand the business environment that the company operates in, the directors should have sound industry experience. This poses a problem as best knowledge of the industry is within the company itself or its competitors. Insider directors that can bring industry knowledge to the board are not independent and managers that work for competitors cannot be used as directors for obvious reasons. Managers from suppliers or customers could potentially possess the understanding of the industry but they would be biased and could try to push through their own agenda. This emphasis on industry knowledge may explain partially why some companies have several insiders on their boards (Weisbach, 1988)

In addition, Weisbach (1988) among others have suggested that the board insiders add value also in other distinctive ways. First, the inside power struggle for CEO position is such that insiders give the outside board members information in exchange for CEO position in the future. The board is unable to obtain this information otherwise. Second, the outside board members can evaluate insiders as future CEO. Furthermore, a recent theoretical framework presented by Raheja (2000) suggests that there is an optimal mix of insiders and outsiders on the board, depending on the verification costs related to nature of the business.

Understanding the position that the company has within the industry and the strategic flexibility and options that the company has, inherently requires substantial managerial experience from the directors. This may partially explain the high number of directors that serve as CEOs within other companies.

### 2.3.3 Incentives for Directors

The incentives that the directors for acting in the best interest of the shareholders have can be divided into three groups: legislation, reputation and financial incentives. First, directors have fiduciary obligation to act in the best interest of the shareholders imposed by the corporation laws. Directors failing to meet their responsibilities can be held liable for damages. However, companies protect their directors from liability for most decisions with insurance or by an indemnification provision in the corporate charter. (Bhagat et al., 1987). Therefore, the impact of legal liability as an incentive for directors is difficult to quantify. (Perry, 1999)

Second, directors are influenced by their desire to maintain their good reputations as astute businessmen and monitors. According to Fama (1980), the managerial labor markets affects the actions of the managers. Gilson (1989) reports that managers resigning from financially distressed firms do not commonly find employment at other exchange-listed companies. Cannella et al. (1995) discover similar evidence from Texas banking industry. They also find that the labor market differentiates the reason for resignation in the terms of whether the reason was beyond the control of the manager or if manager was directly responsible for the poor performance.

Fama and Jensen (1983) applied the same theory to outside directors: the more the outside directors are concerned about their reputation, the more vigilant they will be in their monitoring. Gilson (1989) finds that directors that leave financially distressed firms subsequently hold fewer directorships. Furthermore, Brown and Maloney (1999) report that companies with more reputable directors are more successful in acquisitions. However, the reputational incentives can also have negative side effects. The directors have limited upside potential if the company is successful (assuming nonexistent or insubstantial performance pay component), but unlimited downside if the company ends up in financial distress (cf. short position in a put option). Consequently, the directors have strong incentives to select projects that have below optimal risk level for the shareholders.

Finally, the directors are influenced by financial incentives including equity ownership, or equity based compensation in the form of shares or options. Inside board members are naturally included in the executive compensation plans and consequently can have substantial equity stakes. The independent directors, on the other hand, commonly have very low equity stakes in the company. To correct this oversight many companies have initiated incentive-based pay for directors and the percentage of these firms increased from 48 to 70 from 1992 to 1995. (Perry, 1999) Contrary to criticism that the board is often passive, ineffective and wary to confront the incumbent management, Bryan et al. (2000) report that the board compensation is structured to mitigate agency problems inherent in firms whose management control is separated from ownership.

### 3 PREVIOUS STUDIES ON CORPORATE GOVERNANCE

The relationship between board composition and company performance has been quite heavily studied. The studies have mainly focused on board's independence, but increasingly also other aspects – such as board committee structures – have received the interest that they deserve<sup>3</sup>. The studies have generated results that are often conflicting, which implies that the 'whole' truth remains veiled. In this chapter I will present some of previous studies in this area. The studies are almost entirely of US origin, but increasingly corporate governance studies are made also in other countries.

The remaining chapter is divided into three sections, each covering a specific aspect of board composition. In these sections I will first present the studies on the relationship between company performance and the specific board attribute (i.e. independence, size, director ownership). I will then move on to present studies that have explored the drivers for chosen structure of corporate governance. First section deals with board independence, while the second section focuses on board size, and the third part is devoted to the topic of director ownership.

#### 3.1 BOARD INDEPENDENCE AND COMPANY PERFORMANCE

In this section I will only discuss the relationship between level of board independence and company performance, and only touch upon the factors that affect the level of independence. The reason is that there are really no studies on the drivers of a chosen level of independence.

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<sup>3</sup> Especially April Klein has been very active in this field. See for example Klein 1998a, 1998b, 2002, 2000.

The studies on relationship between board independence and company performance can be further divided into three distinctive groups: event studies, efficacy with discrete tasks, and studies on firm performance. Event studies analyze the effect of changes in the board on the share price. Studies focusing on discrete tasks explore the efficiency of insider dominated versus outsider dominated (i.e. independent) boards on various special situations such as takeover bid, acquisition, or CEO replacement. Studies on firm performance try to establish a relationship between board independence and firm company performance.

### **3.1.1 Event Study Approach**

The two most often cited event studies on board independence are by Rosenstein and Wyatt. In their 1990 study, they find an approximately 0.2% positive share price reaction to the announcement of an additional outside director appointment. This indicates that stock market views increased independence to be beneficial for the stockholders in the long-run. Contrary to expectations, in their 1997 study, they find that stock prices do not respond to an appointment of an additional insider to the board.

The market reaction would suggest that markets see increased independence as a positive sign, but increased dependence as a neutral event. However, the 0.2% positive reaction is, even though statistically significant, economically insignificant to an individual shareholder. On the other hand, for a company with market value of USD 5 billion, 0.2% increase would mean an increase in value by USD 10 million.

### 3.1.2 Efficacy on Discrete Tasks

Considerably large body of literature is devoted on investigation the effect of board independence on carrying out various responsibilities. These discrete tasks include replacing CEO, awarding golden parachutes, poison pills, or behavior in a takeover situation.

Weisbach (1988) finds that majority-independent boards replace CEO more easily than insider dominated boards. Brickley et al. (1994) report a statistically significant positive reaction to an announcement of a poison pill when the board contains mostly independent directors. A negative reaction is significant when the board is insider dominated. Furthermore, they also find that the probability of a subsequent control contest is associated with the fraction of independent directors on the board. The evidence suggests that the market views that the outsider-dominated boards better serve the interests of the shareholders, especially in takeover situations.

Brown and Maloney (1999) study 82 companies attempting 106 acquisitions during the 1980s. They find that poor performance is more likely to occur in companies that have recently experienced higher turnover of outside and lower turnover of inside directors.

Cotter et al. (1997) find that tender offer targets with majority-independent boards realize on average 20% higher returns than other targets between 1989 and 1992. This implies that independent boards are better serving the interests of the shareholders by negotiating higher premiums than their insider-dominated counterparts. In Cotter et al. (1997) study the proportion of independent directors in the target companies was only 36%, compared to almost 60% level reported in other studies (Bhagat and Black, 2002; Klein, 1998a; and Yermack, 1996). According to Bhagat and Black (1999) the difference is large enough to arouse suspicion that maybe the

bidders avoid companies with high proportion of independent directors, which seems logical if in the light of the findings by Cotter et al. (1997). If independent directors are effectively monitoring the company, then it's valued at a fair price and there is less to gain<sup>4</sup> from the acquisition than in a case where the company is poorly managed and trading below intrinsic value. If acquirer's management recognizes this fact, then they will focus on targets that have more insiders on their boards.

As expected, Byrd and Hickman (1992) report that tender offer bidders without majority-independent boards have -1.8% returns, while there is no market reaction for bidders with majority-independent boards. The market interprets takeover news in a neutral way when board is independent of the management, but negatively when insiders are deciding on the deals. This is perfectly inline with the agency theory dilemma involving empire building.

Lee et al. (1992) study management buyouts, where the monitoring by the independent directors is especially valuable to the shareholders as the insider directors have a conflict of interest: personal gains vs. shareholder value. Not surprisingly the results indicate that shareholders obtain higher premium in the management buyouts if the company has a majority-independent board.

### **3.1.3 Direct Relationship with Firm Performance**

The studies that aim to establish a link between board independence and firm performance are numerous, but the results are inconclusive. This is partly because the company performance is affected by a myriad of other things in addition to board composition. Some of the noise is also

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<sup>4</sup> In effect it is only the NPV of the potential synergies between the two companies in question. The value of synergies has to be greater than the premium over the stock price that the acquirer is forced to pay in order to make the deal financially sensible

caused by the unclear definition of independence. Commonly, board is considered independent if number of independent directors exceeds 50%, but in some studies the cut-off is at 60%. Furthermore, the treatment of 'affiliated directors'<sup>5</sup> is also inconsistent in various studies: in some studies they are regarded as independent, but in most studies they are considered as insiders. As a result, the findings from various studies are not always entirely comparable.

Hermalin and Weisbach (1991) find no significant same year correlation between firm performance and board composition. They use Tobin's q as a measure of success on 134 companies listed on NYSE. The time span of data includes years 1971, 1974, 1977, 1980 and 1983. Yermack (1996) finds very significant negative (significant at 1%) relation between proportion of independent directors and company valuation (also measured by Tobin's q). The relationship is very strong when OLS regression is used, but the relationship reverses (significant at 10%) when fixed-effects model is applied. However, Yermack finds no significant correlation for other performance variables such as Sales/Assets, Operating Income/Sales or Operating Income/Assets. His sample includes 452 largest public US companies with data ranging from 1984 to 1991. The difference might be partially accounted by the sample size: in Hermalin and Weisbach (1991) the sample size is 644 while in Yermack (1996) the sample has 3,400 observations. Furthermore, Yermack has more stringent method of calculating Tobin's q and also larger set of control variables.

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<sup>5</sup> Affiliated directors (in some studies referred as 'gray directors') are former employees of the company, or relatives of the current managers. Thereby, the directors might be loyal to the CEO and consequently cannot be regarded as independent

Agrawal and Knoeber (1996) confirm Yermack's findings with more crude measures of Tobin's  $q$ . Also Klein (1998a) reports a significant negative correlation between proportion of independent directors and a measure of change in market value of equity. However, she also reports insignificant results for return on assets and raw stock market returns.

Bhagat and Black (2002) do not find evidence that greater board independence would lead into improved firm performance. However, they find strong correlation between poor performance and subsequent increase in board independence. The result corroborates the earlier findings of Hermalin and Weisbach (1988) that companies are more likely to add outsiders to the board after poor performance. However, Kini et al. (1995) find that after a takeover a company's board will regress to mean in terms of composition of insiders versus outsiders.

One of the contributions of Bhagat and Black (2002) study is that they study long-term company performance, their data covers the period from 1985 to 1995. However, they assume that the board composition is stable in time, and hence use the board composition data from 1991. However, according to Denis and Sarin (1999) board stability is gross misassumption. Their evidence suggests that a substantial fraction of companies exhibit large changes in ownership and board structure in any given year. For the whole 10-year period 65% of the companies undergo at least one major change in ownership or board structure. Both studies have substantially overlapping time frames: Dennis and Sarin (1999) have data from 1983 to 1992.

### **3.1.4 Factors Affecting Board Independence**

The factors behind the chosen level of board independence are not studied as such. However, Tukia (2001) finds that level of board independence is related to the investor base of the company. His findings indicate that domestic institutional investors seem to prefer board independence and consequently in companies with substantial domestic institutional holdings the level of board independence is higher than in companies with substantial domestic individual holdings.

## **3.2 BOARD SIZE**

### **3.2.1 Size of the Board and the Company Performance**

The groundbreaking work in this field is by David Yermack (1996), who studies 452 out of 500 largest public US corporations drawn from Forbes magazine rankings between 1984 and 1991. He finds a significant negative relation between size of the board and market valuation (measured by Tobin's  $q$ ). The results are verified by similar negative correlation between board size and various accounting measures of profitability. Eisenberg, Sundgren and Wells (1998) using Finnish data on 900 small and mid-sized companies also report similar findings for small board sizes and thus corroborate Yermack's findings, which were obtained on large US companies. Bhagat and Black (2002) find that the inverse correlation between board size and performance is not robust to the choice of performance measure. However, Kini et al. (1995) found evidence that board shrinks in size for under-performing firms after a successful tender offer. In addition, Brown and Maloney (1999) find that larger board size predicts lower stock price returns to acquiring firms in takeover situation, indicating that smaller boards are more effective.

### **3.2.2 Factors Affecting Board Size**

The reasons why companies have chosen the particular board size remain mostly uninvestigated. Mak & Roush (2000) comment that larger boards are seen as being more capable to monitor the management, as it is more difficult for a CEO to dominate larger boards. On the other hand, Yermack (1996) comments that even if the capacity for better monitoring increases together with the size of the board, so do the disadvantages in form of slow decision-making or less candid discussions (especially on sensitive matters such as managerial performance).

However, one thing seems clear. Yermack (1996) points out that size of company and size of board tend to correlate. This is logical: the monitoring of a larger company requires more diverse knowledge than smaller one and consequently the number of directors tends to increase. Furthermore, the scale of activities for a board of a large company is wider and hence more experience might be required.

Anecdotal evidence also suggests that companies within a certain industry usually seem to adopt similar forms of governance. Whether this is best practice from experience or an example of herding behavior among managers, is unclear. However, it seems natural to assume that companies in various industries are different and therefore need different forms of governance. This is supported by Mak and Roush (2000), who state that larger boards are better from resource-dependence perspective but worse from strategic decision-making perspective. This line of thinking is supported by findings of Agrawal and Knoeber (2001), who find that boards in carefully restricted industries, or industries where the government is a major customer, are larger than in other industries. The rationale is that companies within these specific industries need more expertise in legislation and more political contacts than companies in other industries. They find that number of politicians and layers is larger on the boards in these specific industries, such as the defense industry.

Closely related to the previous argument is the ownership stake of the managers. If managers are also owners, the agency conflict is reduced and there is less need for monitoring. By definition, there is no separation of ownership and control and consequently there is no need for large monitoring organ. Mak & Roush (2000) find that companies where insiders have low ownership levels indeed employ larger boards.

Another potential factor affecting board size is the presence of large institutional investors. Large institutional investors are better able to monitor the management in terms of the level of investor sophistication and resources available for monitoring purposes. In addition, because of the relatively large financial interest in the company, they also have considerable incentives to collect information and monitor management. (Shleifer & Vishny, 1986) This line of reasoning implies that size of board in companies with large institutional investors is smaller as the presence of these investors' acts as a substitute for larger board. However, it is not always clear that the interests of the minority holders are in line with those of the large shareholders. In anticipation of this, minority shareholders might opt for larger boards.

### **3.3 BOARD OWNERSHIP AND COMPANY PERFORMANCE**

In this section I will discuss only the relationship between level of board ownership and company performance, because factors affecting board ownership are beyond the scope of this study. In this section it is important to notice the differences between these studies as some of them test company performance against the director ownership, some of them only investigate the relationship between insider director equity holdings and performance, while some explore the link between independent director share ownership and performance. And yet again some of the studies try to establish a direct link between company performance and share holdings, and some explore the performance through some discrete task such as acquisition.

The board represents the shareholders, and monitors the action the managers take, to ensure that all actions best serve the interests of the shareholders. This is best done by having the representatives of the largest shareholders on the board. However, increasingly companies are owned by institutional investors such as pension funds who are unwilling to have their

representatives on the boards because then the selling of the shares would be restricted as a result of the insiders trading legislation. This development has lead into a situation where the board of directors is mostly consisting of independent directors that have nonexistent, or very small, ownership stakes in the company. Bhagat, Carey and Elson (1999) and Bhagat & Black (2002) show that independent directors perform better when they have substantial stock holdings in the company. This is supported by Brown and Mahoney (1999), who find that companies with boards having larger equity holdings outperform their counterparts in acquisition performance.

On the other hand, insider board members can have very substantial equity stakes in the company. In addition, they commonly have extensive compensation packages that tie their personal wealth to the wealth of the shareholders. In several studies it has been shown that firm performance is relatively sensitive to executive ownership (Hall & Liebman, 1998; Murphy, 1998; Jensen & Murphy, 1990; Boschen & Smith, 1995).

In their seminal work, Morck et al. (1988) find that the relationship between Tobin's  $q$  and director ownership is not linear: stock ownership correlates positively with performance at low and high levels of ownership (up to 5% and then again above 25%), but between 5% and 25% ownership the evidence is mixed. The authors explain this phenomenon by the manager entrenchment that begins to affect the company performance at ownership above 5%. However, at higher levels of ownership (above 25%) the interests of the managers and other shareholders are once again in line, leading into improved performance.

Later some scholars have argued that the relationship is curvilinear instead of linear. McConnell & Servaes (1990) find that the relationship between Tobin's  $q$  and managerial ownership is indeed curvilinear: the coefficient for managerial ownership is positive while the coefficient for ownership squared is negative. Both coefficients are statistically significant.

The differences in findings by Morck et al. (1988) and McConnell & Servaes (1990) has been explained by the different data sets, implying that the phenomenon might be very sensitive to selected time frame or sources of data. (Kole, 1995 in Renfors, 2000) However, the differing time frame explanation does not seem feasible, because in a more recent study by McConnell & Servaes (1995, in Renfors, 2000), the authors find that the curvilinear relationship documented in their earlier study still prevails. Kole examines the effect of changing the ownership data source and finds that that does not explain the differences in findings. However, in an updated replica of the original study by Morck et al. (1988), Habib and Ljungqvist (2000) find a monotonic positive relationship between Tobin's  $q$  and CEO stockholdings.

Renfors (2000) studies the relationship between company performance and managerial ownership in Finland. His sample is somewhat smaller than mine and the studies cover differing time frames (1993-98 compared to year 2000 in my study). His performance metrics are also very close to mine, he uses ROE (as oppose to ROA that I use) and Market-to-book (as opposed to the proxy for Tobin's  $q$ ). He tries to apply linear, curvilinear and cubic models to account for the company performance. He finds that in Finland there is no relationship between company performance and manager ownership. However, he does not apply the piecewise linear regression model used by Morck et al. (1988)

## **4 RESEARCH HYPOTHESES**

In this chapter I will present my hypotheses on the basis of theory and previous studies. Due to the extensive approach, the thesis has large number of hypotheses and explanatory variables. I have divided the hypotheses into three groups. Factors affecting company performance are the topic for the first section. Sections two and three each cover the factors affecting board size and independence, respectively. Appendix 1 lists all the research hypotheses together with their expected signs.

### **4.1 COMPANY PERFORMANCE**

#### **4.1.1 H1: Board Independence**

In accordance with the agency theory, the purpose of the board is to monitor management. Thereby, it is natural to assume that an independent board can more credibly monitor management and control agency problems. However, I also believe that insiders can benefit the board by bringing into the table their industry and business knowledge. If board can make decisions independently from the management, but still draw on the expertise of the insider directors the company should prosper. Therefore, I hypothesize that the relationship between company performance and independence is not linear, but curvilinear instead. This hypothesis is based on past mixed evidence on linking company performance to board independence and the theoretical work of Raheja (2000).

#### **4.1.2 H2: Board Size**

One of the most obvious characteristics of the board is the number of directors that it carries. The larger the board, the more difficult it is for all members to be present at all meetings. Absence will be more frequent resulting in a situation where some directors are not up to their responsibilities. Furthermore, the discussion in large boards might be less candid and uncomfortable issues are not confronted immediately. Hence, my second hypothesis is that the board size has inverse relationship with firm performance. This hypothesis is in line with the findings of Yermack (1996) and Eisenberg et al. (1998)

#### **4.1.3 H3: Insider Director Ownership**

The purpose of the board is to represent the shareholders. The interests of the shareholders and directors are naturally best aligned when directors themselves hold substantial equity stakes in the company. However, the interests of the manager-owners are not entirely the same as those for other owners. These manager-owners can choose whether they receive their benefits in terms of return for investment or as private benefits such as higher pay or perks. My hypothesis is that the insider director ownership has positive impact on low and high levels of ownership, but due to the entrenchment the impact is negative at moderate levels of ownership. This hypothesis is in line with findings by Morck et al. (1988).

#### **4.1.4 H4: Independent Director Ownership**

The alignment of interests between directors and owners is strongest when directors personally own stocks, but also indirectly when the employer of the director has significant holding in the

company. When the director ownership is indirect there are very few personal benefits that the director can obtain compared to leeway that the insider directors have. Therefore, there should be less entrenchment effect and the relationship between independent director ownership and company performance should be positively linear. This is my fourth hypothesis.

#### **4.1.5 H5: Supervisory Board**

The Finnish corporate governance system with management, board and supervisory board originates from Germany. In Anglo-Saxon countries the governance system is more straightforward with management and the board<sup>6</sup>. Study by Hirvonen et al. (1998) indicates that board has taken over most of the functions of the supervisory board, which implies that need for supervisory board is diminishing.

In addition, supervisory boards are commonly substantially larger than boards and they meet rather rarely, indicating that the value added they provide for the management of the company and the shareholders is low. Furthermore, in Finnish popular press and among analysts it seems to be a general view that supervisory boards are in fact value destroying. This line of thinking is not based solely on the costs that the company incurs on maintaining a supervisory board such as fees for supervisory board members, or materials prepared and sent for them. Instead it is founded on the fact that the management spends considerable amounts of time coaching the supervisory board members and on the lag that slow bureaucratic supervisory board causes on decision-making. Based on these arguments, I hypothesize that the impact of supervisory board on company performance is negative.

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<sup>6</sup> For those interested in differences between Finnish, UK and US corporate governance systems, see for example Renfors (2000)

## **4.2 BOARD SIZE**

### **4.2.1 H6: Large Shareholders**

Shareholdings above 5% limit can be considered strategic, because in a company with dispersed ownership these shareholders can have substantial impact on the management of the company (Tosi & Gomez-Reija, 1989). In order to control and influence the management and make sure that all actions that the management makes are in the best interest of these particular shareholders, they require a board seat. Therefore, it is logical to assume that as number of large shareholders increase, so does the size of the board. This is my sixth hypothesis.

### **4.2.2 H7: Institutional Investors**

Institutional investors include two groups of investors: strategic investors and financial investors. The difference between these two is that strategic shareholders opt to influence the management of the company by having representation on the board. Financial investors, on the other hand, do not want to have representation on the board, as it would pose insider-trading restrictions on trading on the stock. Thereby, financial investors appreciate a board that is independent and small enough to be efficient. Hence, my seventh hypothesis is that the relationship between institutional shareholdings and board size is negative.

### **4.2.3 H8: Insider Director Ownership**

Insider director ownership is clearly a vehicle to reduce the agency conflict and align the interests of the shareholders with those of the insiders. However, it is known that insider director interests

are in line with those of the owners only at high levels of managerial ownership. Assuming that board independence and large board size are alternative corporate governance tools then the size of the board should be negatively related to ownership at low levels of ownership and turn positive at moderate levels of insider director ownership and return back to negative at high levels of ownership.

#### **4.2.4 H9: Board Independence**

The succession theory claims that company insiders are elected on the board so that the independent directors can analyze their suitability to be a future CEO. In order to dilute the dominance that CEO and other insiders have over the board (measured by level of independence) the size of the board has to be increased. Hence my ninth hypothesis is that the level of independence and size of the board are positively related.

#### **4.2.5 H10: Growth Opportunities**

The exposure to agency problems that company faces varies depending on the investment and growth opportunities, because growth opportunities give the management considerable freedom to decide where to invest the funds. This implies that managers of the companies with substantial growth opportunities should be monitored more carefully than their counterparts in companies operating in mature industries. Therefore, it seems logical to hypothesize that the size of the board is larger for companies with significant growth opportunities.

### **4.3 LEVEL OF BOARD INDEPENDENCE**

#### **4.3.1 H11: Supervisory Board**

If the company has a three layers corporate governance system i.e. has a supervisory board, then there is less need for independent board. In fact, at one extreme, board can include only insiders. Therefore, my eleventh hypothesis is that the level of board independence is negatively related to the existence of a supervisory board.

#### **4.3.2 H12: Large Shareholders**

In a situation where the ownership of a company is very concentrated to one, or several, large shareholders there is less need for highly independent board. These large shareholders will monitor management very carefully and take action when needed to ensure that all decisions are made in the name of shareholder value. My twelfth hypothesis is that the existence of large shareholders leads into less independent board.

#### **4.3.3 H13: Institutional Investors**

As already mentioned, institutional investors do not wish to participate in the actual management of the company through the board, instead they opt for small board with highly respected independent directors. Bearing this in mind, my thirteenth hypothesis is that the relationship between institutional shareholdings and board independence is positive. This hypothesis is in line with the findings from Tukka (2001).

#### **4.3.4 H14: Insider Director Ownership**

Director ownership is clearly a vehicle to reduce the agency conflict and increase the alignment of interest of owners with those of directors. If directors themselves are also owners then there is less need for highly independent board. However, if independence is truly an alternative for other governance models, the relationship between independence and insider director ownership is not linear. Thereby, I hypothesize that the director ownership has a negative relationship on the level independence of the board at moderate levels of ownership, but will become positive after a while and returns to be negative at high levels of insider director ownership.

#### **4.3.5 H15: Growth Opportunities**

Relationship with growth opportunities and magnitude of the agency problems has already been discussed earlier. Building on that, it seems natural to assume that the board should be more independent in companies with significant growth opportunities. That is my final hypothesis.

## **5 DATA AND METHODOLOGY**

In this chapter I will describe the data and the methods used in this study. First section deals with the company performance metrics and the second describes the date set used in the study. The regression equations used in the analysis are presented and described in the third section. The fourth section focuses on some specific issues on the data such as normality, multicollinearity, heteroskedasticity, and outliers.

### **5.1 COMPANY PERFORMANCE MEASUREMENT**

#### **5.1.1 Chosen Performance Metrics**

For an investor the ultimate measure of company performance is the total return to shareholders that comes from share price appreciation and dividends. Any changes in corporate governance principles are reflected in the stock market returns, not in the dividends. However, in efficient capital markets, the stock market immediately adjusts the market value of company to include any changes in the corporate governance. Therefore, the only viable approach to apply raw stock returns would be an event study. The event study approach is not feasible for this type of study and consequently I will use other measures of firm performance.

I have chosen two distinctive measures of company performance: Return on Assets (ROA) and market valuation (MV). These two metrics were chosen because they represent alternative ways to analyze company performance. Despite many problems with the use of earnings based data, such

as backward looking approach and short-term fluctuations<sup>7</sup>, I have chosen ROA. MV is based on future cash flow expectations and is thereby by definition forward-looking and focused on long-term perspective. In addition, ROA is more tangible than MV and not affected by market sentiment and investor behavior while MV captures exactly these aspects of performance measurement. Furthermore, I chose ROA instead of Return on Equity (ROE), which would be more theoretically sound, because it is not affected by different capital structures or tax related issues. For the same reason I also chose MV instead Market-to-book ratio.

### 5.1.2 Calculation Methodology

I have used the following formula for the calculation of ROA. Earnings before taxes and extraordinary items and interest expenses are from fiscal year 2000 that ended for all sample companies on December 31<sup>st</sup>, 2000. The corresponding total asset figure is as of 31.12.2000.

$$\text{ROA} = (\text{earning before taxes and extraordinary items} + \text{interest expenses}) / \text{total assets} \quad (1)$$

The second measure, MV, is proxy for Tobin's q. Tobin's q is a relative market valuation measurement and it is widely used in reference studies<sup>8</sup> and chosen in order to enable comparisons. Tobin's q is theoretically robust measurement of performance in terms of market valuation. It is calculated in the following manner:

$$\text{Tobin's q} = \text{Market value of assets} / \text{Replacement cost of assets} \quad (2)$$

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<sup>7</sup> For a thorough discussion on the topic see for example Fisher & McGowan (1983), Solomon (1970), or Stansfer (1971) in Jensen & Chew, 2000

<sup>8</sup> For example Bhagat & Black (2002), Agrawal & Knoeber (1996), Yermack (1996), or Hermalin & Weisbach (1991)

However, because of the subjective nature of assessing the replacement costs of various balance sheet items, I have used a proxy for Tobin's Q:

$$MV = (\text{market value of equity} + \text{book value of debt}) / (\text{book value of assets}) \quad (3)$$

This proxy should not distort the findings, because according to Chung and Pruitt (1994) there is very high correlation between relatively careful and crude measures for estimating Tobin's q. This method has also been used extensively in similar international studies. (Bhagat & Black, 2002 and Agrawal & Knoeber, 1996)

For the calculation of market value of equity I have used an average of closing prices from the following dates 31.3.2000, 30.6.2000, 29.9.2000 and 29.12.2000. This was done in order to neutralize the effects of short-term market fluctuations.

For those companies, which have two share classes I have used closing prices for both series and multiplied them with the corresponding number of outstanding shares. However, there are several companies, which have two series of shares and only one of them is listed. In these cases I have used the closing price of the listed share class for both series. This is justified because the shares are commonly entitled to equal dividend, and in a case of bankruptcy they have equal claim for the residual value. The main difference is that the non-listed shares usually carry higher voting rights (typically 20 to 1, maximum difference permitted in the Finnish Company Act). In addition, the shares also often convertible to listed share class with 1:1 ratio. Actually, treating shares equally might slightly understate the value of the voting shares, because according to Doidge (2003) the average voting premium in Finland is 7.2% and medium premium is 3.2%. However, the impact should be minimal.

If there were no trades on the particular day, and hence no closing value, I have used the average of bid and ask. There were two instances where there was market price for only either bid or ask. Then I have used that particular offer price. The effects should be negligible.

## 5.2 DATA DESCRIPTION

### 5.2.1 Sources of Data

The data used in this study was gathered from the published annual reports for fiscal year 2000, but it is also supplemented with personal inquiries sent to the companies by email to gather some parts of data that were not published. The ownership information for the companies failing to publish that in their annual report were obtained from the databases of Arvopaperikeskus (APK, Central Depository), which is subsidiary of the Helsinki Exchanges (HEX). Additionally, ownership variables such as percentage of shares owned by Finnish institutional and Finnish individual investors are taken from *Share Ownership in Finland* by Karhunen & Keloharju (2000).

### 5.2.2 Industries Included in the Study

The data used in this study consists of 67 companies that are on the main list or on the Investor (I) list of HEX. These companies represent 11 different industries and the number of companies per industry varies from three (Chemicals and Transport) to 14 (Metals & Engineering). Appendix 2 illustrates the distribution of companies within different industries and across different lists. The distribution of different industries is relatively even, except for high weight on Metals & Engineering. Also, 18% of the companies are listed as Other Industries, which is heterogeneous

group of companies that have products ranging from flies used in fly-fishing (Rapala Normark) to car and truck tires (Nokian Renkaat) or from design apparel (Marimekko) to furniture (InCap and Martela). Most of the companies, 84%, in the study are listed on the HEX main list.

The five industries not included in the study are Insurance, Energy, Telecom & Electronics, Banks & Finance, and Investment. Insurance and Energy industries were excluded because they hold only one (Pohjola) or two companies (Fortum and Espoon Sähkö), respectively. Inclusion of these companies could distort regression results by reallocating significance to/from the industry variable.

Telecom and Electronics industry was excluded because of the extraordinary market conditions that the sector faced during the study period. The stock market rally peaked at the spring of 2000 and after the technology bubble burst the prices plunged substantially. The elevated prices and the volatility in the stock prices would have affected directly the market valuations that are used to measure the success of the company and thus distorted the findings substantially. As an illustration, on average the Telecom and Electronics industry (together with IT companies from the Other Services industry) dropped during the study period 50% (annualized). The other industries on average witnessed price decreases of 16%. Thereby, I also excluded IT service companies (Aldata, Novo Group, and TietoEnator) from Other Services industry. Following the commonly accepted practice I excluded Banks & Finance and Investment industries due to specific nature of these industries.

### 5.2.3 Companies Excluded from the Study

Some individual companies were also excluded for variety of reasons. Industry that the company operates in is indicated in parentheses. I have also marked companies listed on I-list to notify that in these cases the industry classification is my own subjective categorization, not the official HEX classification.

1. **Inconsistent financial reporting** (fiscal year ending either 31.3. or 30.9): Danisco (Food Industry), Viking Line (Transport)
2. **Major structural changes** (mergers or acquisitions): Finvest (Multi-business), Ford (Trade), Kauppakaari (Media & Publishing, I-list), Kontram (Metals & Engineering, I-list), Markkinointi Viherjuuri (Other Services, I-list), PI-Consulting (Other Services, I-list), Saunatec (Metals & Engineering, I-list)
3. **Missing information**: Birka Line (Transport), Keskisuomalainen (Media & Publishing), Kesla (Metals & Mining, I-list), Kylpyläkasino (Other Services, I-list), Plandent (Trade, I-list), Tervakosken Puuhamaa (Other Services, I-list), Turkistuottajat (Trade, I-list), Vaahto Group (Metals & Engineering, I-list), and Yleiselektroniikka (Metals & Engineering, I-list)
4. **Statistical outlier**: Janton (Media & Publishing)

The names of the 67 companies included in the study are listed in appendix 3

#### 5.2.4 Description of the Performance Data

Appendices 4 and 5 show the summary statistics for ROA and MV and the distributions of ROA and LNMV. In the sample the average ROA is 9.6 % and the median is 9.0%. The standard deviation is 6.3%. During fiscal year 2000 Raisio Yhtymä (Food Industry) has the lowest ROA in the sample (-5.1%) and Kyro has highest return with ROA of 34.5%<sup>9</sup>. When looking at the distribution of ROA values, it appears to be quite normally distributed, but somewhat skewed to the left (low end) and is more concentrated around the mean than normal distribution. The descriptive statistics for skewness and kurtosis confirm this.

In terms of valuation, sample companies seem to be trading slightly above their book values. Average valuation multiple is 1.22, with median at 1.14. Valuations have some variation, with a range of 1.53 (from 0.70 to 2.23). Standard deviation is 0.39. Kasola has the lowest valuation multiple of 0.70 and Exel is trading at the highest multiple of 2.23. In terms of distribution, MV is clearly skewed to the left and therefore a transformation using natural logarithm is used to even the differences between companies and bring the distribution closer to normal distribution.

To assess the normality of the distribution of both dependent variables, I used Kolmogorov-Smirnov test. The test statistics and p-values for two-tailed test for ROA, MV and LNMV are shown in following table 5.1.

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<sup>9</sup> From the original sample Janton had the highest ROA, but it was excluded from the analysis as an outlier. The reasons for excluding Janton are explained later on in chapter 5.

Table 5.1: The test statistics and p-values for 2-tailed Kolmogorov-Smirnov test for normal distribution for ROA, MV and LNMV. Significant values are indicated by \*(p<0.20).

	ROA	MV	LNMV
Mean	9,6%	1,22	1,16
Standard deviation	6,4%	0,39	0,30
Test statistic	1,05	1,133	0,74
Significance	0,22	0,15*	0,64

The results indicate that unlike ROA the MV does not pass the normality test at 20% significance level. However, after the LN transformation the hypothesis that distribution is not normal has to be discarded.

### 5.2.5 Explanatory Variables

The following variables are explored in this study and used to explain company performance, chosen level of board independence and board size.

INS	Percentage of board members that are insiders (i.e. employed by the company)
GRAY	Percentage of directors that are either former employees of the company or are related to the current managers
IND	Percentage of board members that are independent from the management
OINS	Percentage of shares owned by insider directors either personally, or controlled through family members or investment companies <sup>10</sup>

<sup>10</sup> For tax purposes (for example to avoid payment of annual capital tax) managers and large individual investors commonly have private investment companies that in turn own the shares in listed companies. The figures for OINS and OINDEP are from 30.4.2001

OINDEP	Percentage of shares owned by independent directors personally, or controlled through family members, investment companies or occupation (i.e. representing their employer at the board). Includes also the shareholdings controlled by the gray directors.
OBOARD	Total percentage of shares owned or controlled by the board (OINS + OINDEP)
DOMINS	Percentage of shares owned by Finnish institutional investors <sup>11</sup>
DOMIND	Percentage of shares owned by Finnish individual investors
NBH	Number of large shareholders (i.e. block-holders) that have above 5% ownership stakes in the company. The 5% limit was chosen for three reasons: a) it is the lowest level of ownership when the owner has to make public announcement, b) it is the lowest level where effective control of the company can be obtained in a company with dispersed ownership (Tosi & Gomez-Reija, 1989) and c) it is commonly used in several reference studies (see for example Bhagat & Black, 2002)
TNBH	Total percentage of shares held by the large block-holders
BSIZE	Number of directors that sit on the board (excluding any deputy board members, that some companies might also have, and the board secretary, unless the secretary is also taking part in decision-making and voting)
RESE	Percentage of annual R&D expenditure from annual sales, used as a proxy for growth opportunities
LNSIZE	Natural logarithm of annual sales, used as a measure of size of the company, but transformed to scale down the magnitude differences between companies

The descriptive statistics for these variables are shown in the appendix 6. An average company has 6.42 directors of which 19.0% are insiders, 4.8% are gray, and the majority (76.2%) is independent. The medians push the independence even higher with figures 14.3%, 0.0% and 83.3%, respectively. The insider directors own collectively on average 6.2% of the outstanding shares with median at 0.0%. The independent directors control (either own them personally, through an investment company, or family members or control them through their employment) on average 20.7% of shares with median at 9.9%. The board thereby collectively controls 26.9% of the shares with median close at 25.0%.

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<sup>11</sup> Values for both DOMINS and DOMIND are taken directly from Karhunen & Keloharju (2000). The figures are based on the situation at 30.6.2000, thus fitting perfectly into the time period covered by this study.

In an average company the foreign investors have 20.0% of shares with remaining 80.0% split between Finnish institutional investors and individual investors in proportions of 47.3% and 32.7%, respectively. The average company has 2.58 large investors holding more than 5% of shares, with their shareholdings totaling at 38.3%. In a median company foreign investors hold 24.0% of share. The proportions for Finnish institutions and individuals are 49.2% and 26.8%. The number of large shareholders in a median company is 3.00 with total percentage of shares at 40.5%.

The size of an average company in the sample in terms of sales is EUR 1,221 million with median company substantially smaller with sales of EUR 484 million. The largest company by revenue in the sample group is Stora-Enso (Forest Industry) with sales of EUR 10,490 million. This translates into natural log of 9.3. Smallest company in the sample is Leo Longlife (Other Industries) with annual sales of EUR 13 million and corresponding natural log of 2.5.

In the same appendix also the results from test of normality of distribution for the variables are presented. The two-tailed Kolmogorov-Smirnov test indicates that the distribution is normal (with significance level of 20%) only for DOMINS, TNBH and LNSIZE.

Additionally, I have two dummy variables that have value 1 if company has the attribute and value 0 if not. These variables are supervisory board (SBOARD) and full-time chairman (FTC). In the sample there are 11 companies (equaling 16.4% of the companies) that have a supervisory board and 13 companies that have full-time chairman (19.4% of the companies in the sample).

The influence of industry is determined by a set of ten industry dummy variables, that have value 1 if company belongs to the specific industry and value 0 if not. Companies that belong to industry number eleven (Other Industries) are specified by having value 0 for all industry variables. This method is necessary to avoid multicollinearity issues with the data.

### 5.3 REGRESSION ANALYSIS

This section is divided into two subsections. First section presents the regression used to explain company performance, while the second section will deal with factors that affect board composition. Board composition is divided further into two parts, first covering board size and second board independence.

#### 5.3.1 Determinants of Company Performance

In the equation explaining company performance I use a similar piecewise linear regression that Morck et al. (1988) use to explain company performance. However, building on argumentation by Renfors (2000) that due to less dispersed ownership in Finland than in the US, the level where managers become entrenched is substantially higher here than in the US, I use 30% and 50% as the cut-off points. Therefore, I have divided OINS variable into three components: OINS1-30, OINS30-50 and OINS50-100 to describe situations where ownership lies between these cut-off points:

$$\begin{aligned}
 \text{OINS1-30} &= 0 \text{ if OINS is } < 0.01 & (4) \\
 &= \text{OINS minus } 0.01 \text{ if } 0.01 < \text{OINS} < 0.30 \\
 &= 0.29 \text{ if OINS } \geq 0.30 \\
 \text{OINS30-50} &= 0 \text{ if OINS is } < 0.30 \\
 &= \text{OINS minus } 0.30 \text{ if } 0.30 < \text{OINS} < 0.50 \\
 &= 0.20 \text{ if OINS } \geq 0.50
 \end{aligned}$$

$$\begin{aligned} \text{OINS}_{50-100} &= 0 \text{ if OINS is } < 0.50 \\ &= \text{OINS minus } 0.50 \text{ if OINS } \geq 0.50 \end{aligned}$$

Impact of ownership by the independent directors is assumed to be linear, so there is no need for piecewise linear approach. The effect of board size on performance is also hypothesized to be linear. The relationship between company performance and the presence of a supervisory board is assumed to be negative.

However, as I hypothesize that relationship between company performance and independence is curvilinear, I apply piecewise linear method also for the analysis on independence. I have arbitrarily selected 75% as the cut-off point, implying that until 25% insiders should add value, but when supermajority (67%) limit is approached insiders begin to affect negatively on performance. The test variables for independence are defined as follows:

$$\begin{aligned} \text{INS}_{0-25} &= \text{INS if INS is } < 0.25 & (5) \\ &= 0.25 \text{ if INS } \geq 0.25 \\ \text{INS}_{25-100} &= 0 \text{ if INS is } < 0.25 \\ &= \text{INS minus } 0.25 \text{ if INS } \geq 0.25 \end{aligned}$$

In this context is important to notice that the percentage limits on independence are somewhat artificial as it is really the number of independent directors that count. As an illustration if a board has six members of which four are independent, then the level of independence is  $2/3$  (~66.7%), but less than 67% needed for supermajority. If there are three independent directors than even normal majority (above 50% is not obtained). On the other hand, if there is only one insider on the board, then the level of independence increases swiftly to 80%.

The equation used to explain company performance takes the following form:

$$Y = b_0 + b_1*INS0-25 + b_2*INS25-100 + b_3*OINS1-30 + b_4*OINS30-50 + b_5*OINS50-100 + b_6*BSIZE + b_7*SBOARD + b_8*OINDEP \quad (6)$$

Additionally, the equation also includes control variables for industry, size of the company and the growth opportunities.

### 5.3.2 Determinants for Board Composition

#### 5.3.2.1 Determinants for Board Size

The following equation is used to explain the size of the board:

$$Y = b_0 + b_1*IND + b_2*SBOARD + b_3*NBH + b_4*DOMINS + b_5*OINS1-30 + b_6*OINS30-50 + b_7*OINS50-100 + b_8*RESE + \text{Control variables} \quad (7)$$

The control variables in this regression are company size and industry.

#### 5.3.2.2 Determinants for Board Independence

The following equation is used to explain the level of board independence:

$$Y = b_0 + b_1*OINS1-30 + b_2*OINS30-50 + b_3*OINS50-100 + b_4*SBOARD + b_5*TNBH + b_6*DOMINS + b_7*RESE + \text{Control variables} \quad (8)$$

The control variables in this regression are company size and industry.

5.4 POTENTIAL ISSUES WITH THE DATA

5.4.1 Normality of Residuals

Just as I have tested all variables used in this study for normality of distribution using Kolmogorov-Smirnov test, I have done the same for residuals from all four regression equations. The following table 5.2 shows the test statistics and their significance. Commonly 20% significance level is used as the threshold in this test. The H0 hypothesis of normal distribution is upheld at for all four regression residuals.

Table 5.2: The test statistics and p-values for 2-tailed Kolmengorov-Smirnov test for normal distribution for residuals from the four regressions. Significant values are indicated by \*(p<0.20).

	ROA	LNMV	BSIZE	IND
Test statistic	0,669	0,609	0,667	0,853
Significance	0,762	0,852	0,765	0,460

5.4.2 Multicollinearity

The data is analyzed to determine the possible multicollinearity of the variables. Variation inflation factor (VIF) and tolerance figures are used to determine whether the independent variables correlate among themselves. If present in the data, the multicollinearity will reduce the significance levels of the regression coefficients and might cause them to be unstable (Sharma, 1996, 272-273). These two indicators are defined as:

$VIF = (1 - R^2)^{-1}$  (9)

$Tolerance = (1 - R^2)$  (10)

High VIF levels (over 5.0) or low tolerance levels (below 0.2) indicate that there is significant multicollinearity in the data. I will report both multicollinearity indicators together with the regression results. The correlations between the explanatory variables are shown in the appendix 7. Several of the variables have high correlations, which will without a doubt affect the results by reducing the significance levels on the coefficients.

### **5.4.3 Heteroskedasticity**

Heteroskedasticity refers to a situation, where the error variances are not constant over all cases. It is associated with situations where Y is non-normally distributed, such as distribution of MV in this thesis. If the Heteroskedasticity conditions are not met then OLS regression coefficients are “unbiased and consistent, but they are no longer minimum variance unbiased estimators”. Should there be signs of heteroskedasticity, then other regression approach (for example iterative weighted least squares procedure) should be chosen. (Neter et al., 1990, 423) Heteroskedasticity should not be a problem after the natural logarithm transformation of MV to LNMV.

### **5.4.4 Outliers**

Draper & Smith (1981, 152-153) comment that one should be very careful when excluding observations as outliers. I still decide to rule one observation as an outlier. Janton’s (Media & Publishing) ROA is 41.4% for 2000 compared to average ROA of 10.0% with standard deviation being 7.4%. This particular observation is thereby located more than 4 standard deviations away from the mean. Excluding Janton reduces the average ROA to 9.6% and standard deviation to 6.3%.

## **6 RESULTS**

This chapter is divided into three sections. The first one describes the Finnish corporate boards. The second one describes the results from the analysis on factors affecting company performance and relates the results with the previous studies in this area. Third one will then present the results from the analysis of drivers behind the chosen form of corporate governance and discuss the potential reasons.

### **6.1 DESCRIPTION OF FINNISH CORPORATE BOARDS**

#### **6.1.1 Board Size**

The average board has 6.42 members (median 7), which is perfectly inline with the findings from Hirvonen (1997), Tukia (2001) and Eisenberg at al. (1998). Compared to US studies it is below average for example Bhagat & Black (2002) report average size to be 11.45 (median 11) board members. Klein (1998a) reports even higher numbers with average board size of 12.3 members.

The board size does vary considerably within the sample group, the minimum number of members was 3<sup>12</sup> and maximum number was 11. Total of 3 companies have only 3 board members, all of which were smaller ones (listed on I-list). The smallest boards on the main list includes four directors, which is the case for Nordic Aluminum, Ramirent, and Aspo. The largest boards belongs to Stora-Enso and UPM, which both operate within the Forest Industry. These boards consists of 11 members. The appendix 8 shows the distribution of board size. It is noteworthy that variation within the sample is quite small, as more than 67% of the companies have five to seven board members.

### 6.1.2 Board Independence

An average board includes 76.2% of independent directors, 4.8% of gray directors and 19.0% of insider board members. The median figures are tilted even more towards independences with corresponding figures 83.3%, 0.0%, and 14.3%, respectively. In general Finnish boards seem to be very independent when compared for example to the US counterparts. Yermack (1996) reports that the US boards on average have 54% of independent directors, 10% gray directors and 36% of insider directors. The corresponding figures reported by Klein (1998a) are 58%, 19%, and 23%, respectively. The latest study by Bhagat & Black (2002) shows the following figures: 60%, 14%, and 26%, respectively. Although the Bhagat & Black (2002) figures are closer to the figures in the sample for this study, the difference in level of independence seems substantial. Unfortunately all three studies use different data sources and time periods thereby rendering vain any comparisons on the development of independence over time. However, Bhagat & Black (1999) note that over time US boards have in fact migrated from insider dominated to majority independent boards.

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<sup>12</sup> Legislation specifies that the size of board: for an incorporated company (i.e. "Osakeyhtiö") there has to be at least three people on the board of directors.

There are huge differences in terms of board independence across the sample companies. There are 20 boards – representing 29.9% of the companies – that consist of only independent directors. This arrangement is the most common form of corporate governance. On the other hand, Kesko's<sup>13</sup> is the only company that has a board that includes only insiders.

Clearly the majority of the boards lie between the two extremes, having some form of mixed boards. There are 43 boards (equaling 64.2% of the sample companies) that I have categorized as independent. They have more than 75% of independent directors on their respective boards. In addition, there are additional 16 boards where share of independent directors is below 75% but above 50%. These boards I have classified as majority independent boards. Thereby, in total there are 59 boards, representing 88.1% of the companies in the sample, where independent directors control the board.

These findings are in line with those by Hirvonen et al. (1998). The authors report that 64% of directors are independent (or gray) and 36% are insiders, and that 65% of the companies have majority independent boards. This is somewhat lower than figures in my sample group. This is probably due to differing time periods and inclusion of non-listed companies in their sample.

Most common insider on the board is the CEO. There are 38 boards, representing 56.7% of companies in the sample, which have CEO as board member. The figures that Renfors (2000) has are somewhat different, he reports that CEO is a board member in 44% of the companies. The difference might be caused by the inclusion of I-list companies that are smaller and more owner-manager led than the larger main list companies that Renfors only uses in this sample. This

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<sup>13</sup> Since then Kesko has made a dramatic change in their corporate governance by abolishing its supervisory board and moving into an independent board of directors.

probably also the reason why Hirvonen et al. report that in 76% of the companies in their sample, the CEO is also a board member. Their sample includes 22% of non-listed companies.

In half of the companies with CEO on the board— that is in 19 companies representing 28.4% of the sample – the CEO is also the only insider on the board. After the CEO, the second most common insider on the board is full-time chairman. There are 13 boards with full-time chairman, equal to 19.4% of the companies. Interestingly, there are 4 (6.0%) boards where the only “insider” is the full-time chairman. Hirvonen et al. find that in 26% of the companies in their study, the chairman is a full-time position.

One major difference between US and Finnish corporate governance is that it is fairly common in Finland not to have a CEO on the board. Actually, the Finnish government, as an institutional investor, has decided that on the companies where they own more than 50% of shares, the CEO will not be a board member. All government owned companies will migrate to this model by the end of this year. (Virtanen, 2002)

Number of insiders on the board is increased by governance model where the personnel of the company have representatives on the board. There are 4 companies that have adopted this form of governance. These companies are Hartwall, Martela, Metso, and Stockmann. Having representatives of the employees on the corporate board is not very common and seems to become even more rare as some of the cited companies have changed their board structure. In spring of 2002 Hartwall was acquired by Scottish & Newcastle brewery, which has no employee representatives on their board. Martela, Metso, and Stockmann maintain their employee representatives on their boards.

Theoretically one of the reasons why insiders are on the board is for the board to be able to evaluate their suitability to manage the company as successors of the current CEO. There are 14 companies in the sample that have 18 other insiders than CEO or FTC on their boards without having majority insider boards. Most common reason, which accounts for 7 directors, is that these insiders are representing personnel. Having family ties is enough to justify board seat for 5 directors. These insiders were related to the owners, or founders of the company, but commonly they also hold some minor ownership stake (less than 5%) in the company. Three insider directors have earned their board seat through ownership of the company (above 5% of shares). Also, three directors have obtained their board seat purely for their expertise, as they do not have substantial ownership or relationship with the owners. The positions that seem to best qualify for insider board seat (after FTC or CEO) are Vice President, Head of Business Unit or CFO.

### **6.1.3 Supervisory Board**

Historically Finnish corporate governance has been split into three layers following the German governance model: executives, board of directors and a supervisory board. AGM has elected a supervisory board that has usually been rather large (10-30 members) who then have appointed directors for the board. The board then controlled and monitored the top management. The ultimate decision-making entity has been the Supervisory board, which makes most important decisions such as appointment of top executives and major strategic decisions. Board of directors has been involved in monitoring and making decisions on more trivial issues. This form of governance has been very heavy on the companies, difficult to understand and the split between responsibilities of the supervisory board and board of directors has not been very clear-cut. Therefore, the Anglo-Saxon governance model that has no supervisory boards has been gaining popularity among Finnish companies and Finnish Companies Act has been changed so that

companies can themselves decide whether they want to have supervisory boards or not. Many companies have acted on this option to dissolve supervisory board.

In the sample group there are 11 companies that still have supervisory boards, accounting for 16.4% of the companies. These companies can be grouped into four groups:

- 1. Finnish government owned:** Finnair, Kemira, and Rautaruukki
- 2. Media and publishing:** Alma Media, Ilkka, and Talentum
- 3. Former co-operatives:** Atria, Lännen Tehtaat, Raisio, and Kesko
- 4. Others:** Orion

The most apparent group of companies is the first group. There are 7 companies in the sample that have Finnish state as substantial owner, out of which 3 (equal to 42.8%) have a supervisory board. The situation becomes even more transparent if companies, where the Finnish state has more than 50% of shares, are examined. There are two companies in the sample: Finnair and Kemira. Both these companies have supervisory boards<sup>14</sup>.

Second group of companies operates in Media & Publishing industry. The sample group has five companies operating in that industry, out of which 60% has a supervisory board. The difference between other industries in terms of supervisory board is considerable, but there seems to be no logical reason for it.

The third group consists of companies from the Foodstuff industry (Atria, Lännen Tehtaat, Raisio) and trade (Kesko). If we examine the three companies from the food industry from which

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<sup>14</sup> In the AGM in 2003 the supervisory board of Finnair was abolished.

the sample group includes eight companies, the percentage of companies that have a supervisory board is 38%, which is substantially higher than the sample average.

Atria, Lännen Tehtaat, and Raisio have historically one thing in common: they are extensions of co-operative farming units. The purpose of these producer co-operatives was to combine forces in order to obtain better bargaining power and to make investments that were beyond reach of any individual producer. Thereby the ownership of these companies was distributed among a group of people with equal ownership stakes (i.e. in the absence of majority shareholder). Taking this into account, the use of large supervisory board seems logical, because a board of directors with all parties represented would be too large to operate effectively. Historically Kesko comes from rather similar situation, being essentially a wholesaler for group of shopkeepers.

The last company of the group is Orion, which is a pharmaceuticals company classified into chemicals industry under HEX classification. Orion has substantial R&D spending, totaling 8% of annual sales. The considerable latitude that management has in terms of investment decisions, as drug development may take up to 10-15 years, seems to be only logical explanation why Orion has an extensive supervisory board to monitor the board and the management.

Compared to Hirvonen et al. (1998) the percentage of companies that have supervisory boards has changed quite dramatically. The authors report that 48% of the companies have supervisory board, compared to 16% figure in my sample group. The difference in numbers is partially explained by the differing sample, but mostly it is in my opinion a result from a major shift in the way companies organize their governance.

#### 6.1.4 Board Members' Stock Ownership

On average board members represent 26.9% (median 25.0%) of the shares in the company. These shares can be in directors' direct or indirect control (through investment companies or family members) or they might be controlling the shares through their position in another company (parent company, venture capitalist, major bank or insurance company). Taking into account that the ownership of Finnish companies is not very dispersed<sup>15</sup>, the percentage seems rather low. Furthermore, the variation between companies is striking ranging from 0% ownership all the way up to 79%.

Independent directors commonly control more shares than the insider board members. On average the independent directors hold 20.7% of shares compared to 6.2% by the insiders. The variation between companies is considerable and when examining the median this is highlighted: independent directors' control 9.9%% of shares while insiders have ownership stakes 0.0%.

However, this figure does not take into account the fact that insider ownership has to be zero if there are no insiders on the board. Taking this into account there are eight (11.9%) companies that have insiders on the board without owning a single share. Furthermore, there are additional 19 boards where the insider ownership is between 0 and 1% of shares. Amazingly, there are total of 27 companies (40.3%) have insider board members that own below 1% of the shares in the company. The corrected average shareholding by insider directors is 8.8%, slightly higher than 6.2% reported earlier. The median is still disappointing 0.0%.

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<sup>15</sup> According to Karhunen & Keloharju (2000), the median number of shareholders in a Finnish company is only 3,600

Ponsse's board has the highest ownership level of 57.8% by the insider directors. The highest independent directors' stake is in Rautakirja, which is a subsidiary of Sanoma-WSOY, where independent directors control 79.1% of the shares.

### **6.1.5 Ownership Structure**

This section is divided into two subsections. First one explores the number of large shareholders that companies have and the total shareholdings by these large shareholders. Final subsection is dedicated for the discussion on the type of owners that companies have.

#### *6.1.5.1 Number of Large Shareholders and their Shareholdings*

In an average company there are 2.58 (median 3.00) large shareholders owning more than 5% of the shares. The number of large shareholders varies substantially within the range of zero to six shareholders. Appendix 8 shows the distribution of number of large shareholders (NBH). There are seven companies (10.4%) in the sample that do not have a single large shareholder. These companies are Amer (Other Industries), Hackman (Multi-business), KCI Konecranes (Metals & Engineering), Kesko, Orion, Raisio Tehtaat, and Stromsdal (Forest Industry). These companies have very little in common, except that they are traded on the HEX main list. On the other extreme, there is one company (Finnlines, transportation) that has 6 large shareholders. The total shareholdings in Finnlines by the six large shareholders is 55.5%.

The average and medium number of large shareholders imply that at least 12.9%-15.0% of the shares in an average company are held by large shareholders, assuming the minimum 5% ownership level. However, in reality the large shareholders own larger block of shares as the average shareholdings are 39.7% (medium 41.7%). This suggests that on average the large

shareholders have approximately 15% stakes in the companies in their portfolio. This is verified by the calculating average and median average ownership stakes by large shareholders, which as 18.4% and 13.6%, respectively. The highest proportion of shares owned by the large shareholders is 84.9% in Metsä-Tissue (Other Industries), which is a subsidiary of M-Real. Highest non-subsidiary related ownership of 82.2% is in Kekkila (I-list, Other Industries).

#### *6.1.5.2 Type of Owner*

Using the information gathered at Arvopaperikeskus (APK, Finnish Central Depository) Karhunen & Keloharju (2000) are able to determine the ownership proportions owned by Finnish and foreign investors. Additionally, they are also able to split domestic shareholdings into institutional investors and individual investors. In the average company in the sample group, 80.0% of the shares are owned by domestic investors and 20.0% by foreign investors. Median numbers emphasize the level of domestic holdings with the corresponding numbers 89.2% and 10.8%, respectively. The highest level of domestic ownership is in Kekkila, which is completely held by domestic investors. Rapala Normark has the lowest proportion of Finnish investors with 4% domestic ownership. In general the companies in I-list seem to have more domestic ownership than the main list companies.

The split between institutional and individual shareholdings is 47.3 compared to 32.7%. However, among the sample there is considerable variation between companies. The lowest level of both institutional and individual holdings is in Rapala Normark with 2.8% and 1.2%, respectively. Rautakirja has the highest proportion of domestic institutional investors with its 94.2% while Ponsse has the highest percentage of individual investors (90.1%).

## 6.2 RELATIONSHIP BETWEEN COMPANY PERFORMANCE AND BOARD COMPOSITION

Appendix 9 shows the results from the regressions explaining company performance by level of board independence, board size, existence of a supervisory board, and the director stock ownership. Both regression equations are statistically significant at 1% level and can explain slightly above 30% of the company performance. However, in both regressions none of the test hypotheses can be accepted even at the 10% significance level. The results from both regressions are similar indicating that results are robust across the two different performance metrics.

In Panel A the results from the regression using Market Valuation as performance measurement are presented. Although the results are not statistically significant, the coefficients have mostly the signs that I hypothesized. Insiders seem to add value at low levels but their impact becomes negative at moderate and high (above 25%) levels. Insider director ownership seems to have negative impact at low levels of ownership, but becomes positive at moderate (above 30%) level. This positive relationship is maintained and even strengthened at high (above 50%) levels of ownership. My hypothesis that relationship is cubic is not valid; results imply that relationship might be curvilinear. Board size seems likely to have negative impact on company performance as expected. Independent director ownership has very slight negative impact on performance. Additionally, supervisory board seems to clear a negative impact on performance, with p-value of 0.13, but the hypothesis cannot be accepted at 10% significance level. However, none of these findings are statistically significant.

Only significant variables in the first regression are the control variables. Growth opportunities have clear and strong positive impact on company performance ( $p=0.003$ ) and there are

statistically significant differences between various industries. However, size of the company does not affect performance at all ( $p=0.518$ ).

The results from regression using ROA are shown in Panel B. Surprisingly, the level of insiders has positive sign for both below and above 25% level. Actually the positive relationship becomes even stronger after 25% level. The ownership variables behave as hypothesized indicating a cubic relationship. The impact of supervisory board is negative as expected and thus inline with panel A results. However, the signs for board size and independent director ownership are opposite to the ones in first regression.

The multicollinearity statistics indicate that within insider director ownership variable the piecewise linear transformation is causing significant multicollinearity. In order to check the robustness of the results, I did the regressions using only two of the three ownership transformations at a time. The coefficients and significance levels in these regressions remain almost identical indicating that multicollinearity caused by the linear transformation does not have influence on the results.

The results for two regressions are mostly in line with the findings from the previous studies. The studies linking directly company performance and level of board independence have had mixed results, but among the latest studies for example Bhagat & Black (2002) have indicated that there is no statistically significant relationship between performance and independence.

Inherently, all of the studies linking independence to performance suffer from several flaws. First, CEOs have considerable influence on the selection and appointment of directors (Shivdasani and Yermack, 1999) and thereby the directors might be more loyal to the CEO than shareholders. It has been shown that directors that have been appointed during the tenure of the incumbent CEO

are more generous in terms of compensation (Core et al., 1999; Yermack, 1997). Second, the definition of independence fails to account for personal friendships or family ties through for example marriage that might affect the loyalty of a director. Third, the labor market of top-management talent is fairly narrow resulting in considerable interlocking between the management and the board. This without a doubt leads into a situation, where regular control mechanisms fail. According to Hallock (1997), there is 20% interlocking in the US boards. Fourth, as a result of shortage of suitable director candidates, small number of directors holds several seats. Consequently, they might not have enough time to focus properly on the monitoring of the companies. (Core et al. 1999)

In terms of director ownership my results are contradictory to previous US studies, as the impact of insider director ownership on performance has been widely established. However, Renfors (2000) finds that in Finland there does not exist any statistically significant relationship between performance and manager ownership. My findings corroborate his findings as I use piecewise linear approach, while Renfors uses curvilinear and cubic models in his thesis.

Furthermore, Morck et al. (1988) study has been criticized because according to Chung and Pruitt (1996), Tobin's  $q$  and managerial ownership stakes both tend to affect each other: the value of the company surely affects the size of the stake that the manager is able to obtain. It is also clear that for larger companies, the managerial ownership is lower in percentage terms. A better way to estimate the causality might be to use the value of the ownership stake.

The impact of board size on company performance has been established by Yermack (1996) in the US on large listed companies and Eisenberg et al. (1998) on Finnish SME's. The reasons why findings are not statistically significant may lie within the low variation within board size. Over

67% of the companies have boards with 5-7 directors with minimum size stipulated by law to be 3, thus leaving very little room for variation.

### **6.3 FACTORS AFFECTING BOARD SIZE**

The results for regression explaining board size by other board composition factors are shown in appendix 10. The equation is significant even at 0.1% level and it is able to explain 62% of board size.

The level of independence has positive relationship with the board size, as hypothesized, suggesting that increased independence of the board is obtained by increasing number of independent directors instead of reducing of number of insiders. Interestingly, the supervisory board does not have statistically significant impact on board size and expected sign indicates that the impact is more likely to be positive than negative. This is surprising and in my opinion a clear indication that role of the board has changed from a pure monitoring organ (that supervisory board without a doubt is) into a key resource and sparring partner for the managers.

Number of large shareholders has a positive impact board size, while proportion of institutional shareholdings has a negative effect. Both of these findings are in line with my hypotheses.

The relationship between insider director ownership and board size does not follows the expected pattern. The relationship is positive at low levels of ownership and becomes negative at moderate level of ownership and returns to be positive at high ownership levels. However, the coefficient for the last piece is not statistically significant. These findings would imply that the entrenchment in Finland takes place at low ownership stakes (1-30%). Additionally, these are still some factors

at work that are not captured by the regression model that can have impact on board size and be interrelated to insider director ownership.

Unlike expected, the growth opportunities do not seem to affect the board size. The sign is positive but coefficient does not statistically significantly differ from zero. Both control variables in this regression are statistically significant: clearly there are industries where board sizes differ significantly from the average and also the relationship between company size and board size is very strong and statistically significant ( $p=0.000$ ).

#### **6.4 FACTORS AFFECTING BOARD INDEPENDENCE**

Results for the regression used to explain chosen level of board independence are shown in appendix 11. The equation is statistically significant ( $p<0.000$ ) and it explains 42% of the chosen level of independence.

The level of board independence is affected by the company ownership. Total shareholdings by large shareholders have significant positive impact on independence. Insider director ownership has a cubic relationship with independence: negative impact on low levels of ownership, positive at moderate ownership stakes, while returning to be negative at high levels of ownership. This supports the entrenchment rationale behind insider ownership.

Interestingly, having a supervisory board does not seem to have any impact on chosen level of independence. This raises a question on how exactly do supervisory boards add value to the companies.

Contrary to Tukia (2001) I find that level of domestic institutional holdings does not affect independence statistically significantly.

Growth opportunities also has clear positive impact on chosen level of board independence, implying that monitoring is still a major factor in companies where managers have substantial leeway on investment decisions. However, neither company size or industry can account for differences in board independence.

## **7 CONCLUSIONS**

The final section is divided into two parts: first discusses the relationship between board composition and company performance, while the second summarizes the findings for factors explaining board independence and size.

### **7.1 BOARD COMPOSITION AND COMPANY PERFORMANCE**

This part is divided into four subsections. First discusses the relationship between company performance and board independence, second focuses on director ownership, third on board size, and the last one is dedicated to the discussion on factors that cause noise in the data.

#### **7.1.1 Board Independence**

It seems that in Finland the level of independence does not have an impact on company performance. This result is in line with the most recent US studies, raising a question whether the phenomenon reported in earlier studies has actually ceased to exist. Historically, the boards of major US companies have been quite often filled with insiders. However, in recent US studies the level of independence has been rather high, slowly approaching the levels described in this study. This could be one of the reasons why the phenomenon has apparently ceased to manifest in the US and why it is not captured in this study either.

One potential flaw with this study might be the difficult distinction between independent, gray and insider directors is sometimes very difficult. Without a doubt there are some gray directors (for example past employers of the company) that perform their duties objectively. On the other hand, some directors that are classified as independent might have very close personal ties to CEO that are not captured by the current classification which lead them to be less objective. This is

very problematic especially in a country like Finland where everybody in leading positions knows each other personally.

In addition, the classification of entrepreneur-owners is challenging. If they act as managers, they are classified as insiders. On the other hand, they have stronger incentives to act in the best interest of the owners than managers normally do as a result of their sometimes sizeable financial commitment in the company. This is a clear problem that distorts the findings, because in Finland the listed companies are smaller than their international counterparts and therefore commonly more closely held and run in an entrepreneurial fashion.

### **7.1.2 Director Ownership**

The results from this study corroborate the findings by Renfors (2000) that in Finland ownership does not affect the company performance. The reason might be that the relationship does not exist, or that we have been unable to capture it. Potential reasons for the former could be the strong presence of large shareholders in almost all companies, which acts as a substitute for director ownership. For the latter part, the main reasons in my opinion are the low number of observations (67 companies) and their heterogeneity (large international companies, large domestic companies, small international companies, and small domestic companies; companies from 11 different industries with Other Industries as the second largest group).

In terms of director ownership, I have some ideas how the methodology applied in this study could be improved. Firstly, I have lumped together both the personal shareholdings of independent directors and the holdings that they control through for example their employment. This distorts the picture, as the wealth of the director is not decreased if the share price decreases unless they actually bear the risk fully. Additionally, using natural logarithm of actual value

instead of percentage of total shares owned by managers might clarify the results. Furthermore, it seems that directors personally have rather low ownership stakes in the companies, but additionally several companies in Finland have followed international trend and granted directors options. The impact of these options on company performance could also be explored.

### **7.1.3 Board Size**

Board size is substantially smaller and there is less variation in the size in Finland than in the US. This might lead into a situation where the differences between companies are too small to be sensitive to the tests applied in this thesis. Eisenberg et al. (1998) tested the hypothesis for small and medium size companies with Finnish data and found a clear negative relationship. However, the level of corporate governance requirements in terms of independence and transparency are substantially less strict for small and midsize companies than for the exchange listed ones.

### **7.1.4 Discussion on Sources of Noise**

There are several factors that could have distorted the results in this study. They are related to stock market turbulence, study time frame, and different corporate governances.

One potential cause of noise in this study has been the recent stock market turbulence that has affected substantially the market valuation levels. The stock prices reached their peak in early spring 2000 and then the freefall gradually began. I tried to mitigate the problem by taking average price for all stock series on four dates over a period of one year and excluding IT & telecom companies from this study. This reduced the market value fluctuations, but the impact on results is inevitable.

Another factor affecting results is that they are based on one year results only, thus giving only snapshot view on the topic. One way to mitigate this problem would be to have a longer time series that would really bring out companies that perform well. This approach has several flaws as well, because according to Dennis & Sarin (1999) the board and ownership are not stable over time. Then the differences across companies might average out hence diluting the results.

There is also ample anecdotal evidence that the mergers, acquisitions and divestitures have shaped the Finnish corporate landscape at fast pace over the last few years. I have listed here some deals as mere illustration, list is not in any way meant to be exhaustive. In banking sector Sampo acquired Mandatum and Pohjola bought Conventum. In metals and engineering Outokumpu first merged its stainless steel subsidiary with Avesta-Sheffield to form AvestaPolarit and a year after listing bought it back with open tender. Same industry was also shaken last year by Kone acquisition of Partek, where Finnish state became majority owner in Kone. In telecom industry major corporate ownership change will take place when Sonera and Telia merge. Other deals within telecom sector in Finland include the mergers of Wecan & Scanfil, and JOT Automation & Elektrobit and demerger of Finvest into Finvest, EQ Holding, Evox Rifa Group and Vestcap.

One explanation for the results that deviate from the ones obtained with the US data is the different corporate culture that exists in Finland. The boards tend to be smaller in Finland, the role of CEO is less dominant on the board (quite often CEO does not have a seat on the board<sup>16</sup>), the boards are more independent in Finland than they are in the US, and the ownership of the

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<sup>16</sup> According to Yermack (1996) that in 83% of the Forbes 500 largest US public corporations the CEO is also the chairman of the board. In Finland having both CEO and chairman of the board positions is not possible unless the company has a supervisory board and share capital is less than FIM 1 million (Finnish Companies Act), consequently there are no companies in the sample group that would have same person acting as chairman of the board and CEO.

companies is less dispersed often leading to existence of a large shareholder. Therefore, the board working arrangements seem to at least as effective in Finland as they are in the US indicating that the company differences are too small to be noticed with the low number of observations in the study. This argument receives support from the study by Black (2000), who analyzed the valuation differences in Russian companies based on their governance practices. He concludes that

*“... yet perhaps the problem is with the data not the proposition. The minimum quality of American corporate governance, set by law and by norms so widely accepted that almost no public firms depart from them, is quite high. The variation is small, perhaps too small for performance differences to emerge from the large amount of “noise” (other factors that affect firm performance) that afflicts all empirical studies in this area.”*

## **7.2 FACTORS BEHIND INDEPENDENCE AND BOARD SIZE**

Additional purpose of this thesis was to explore the factors behind chosen form of governance. In terms of board size it is clear that level of board independence has significant positive relationship with board size. Other factors that affect board size are number of large shareholders (positive effect) and level of domestic institutional ownership (negative). Insider director ownership has negative impact on board size at low levels (1-30%) of ownership, but the relationship is reversed at moderate (30-50%) ownership levels. Additionally, size of the company and industry it operates in also have bearing on selected board size.

The level of board independence is affected by the company ownership. Total shareholdings by large shareholders have significant positive impact on independence. Insider director ownership has a cubic relationship with independence: negative impact on low levels of ownership, positive

at moderate ownership stakes and returning to be negative at high levels of ownership. This supports the entrenchment rationale behind insider ownership. Contrary to Tukia (2001) I also find that level of domestic institutional holdings does not affect independence statistically significantly.

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## APPENDIX 1: SUMMARY OF RESEARCH HYPOTHESES

Summary of all 15 research hypotheses under examination in this study with their expected signs

Company performance		Expected sign(s)		
H1	Board independence	+		
H2	Board size	-		
H3	Insider director ownership	+	-	+
H4	Independent director ownership	+		
H5	Supervisory board	-		
Board size				
H6	Large shareholders	+		
H7	Institutional investors	-		
H8	Insider director ownership	-	+	-
H9	Board independence	+		
H10	Growth Opportunities	+		
Board independence				
H11	Supervisory board	-		
H12	Large shareholders	-		
H13	Institutional investors	+		
H14	Insider director ownership	-	+	-
H15	Growth Opportunities	+		

## APPENDIX 2: INDUSTRIES REPRESENTED IN THE STUDY

The distribution of sample group of 67 companies listed on the Main list or the Investor list of Helsinki Exchanges in 2000 by their industry and respective list.

		Number ofPercentage companies from total	
Industry			
1	Transport	3	4 %
2	Trade	6	9 %
3	Other Services	4	6 %
4	Metal & Engineering	14	21 %
5	Forest Industry	4	6 %
6	Multi-businesses	4	6 %
7	Food Industry	8	12 %
8	Construction	4	6 %
9	Chemicals	3	4 %
10	Media & Publishing	5	7 %
11	Other Industries	12	18 %
	Total	67	100 %
<b>List</b>			
	Main List	56	84 %
	Investor List	11	16 %

### APPENDIX 3: COMPANIES INCLUDED IN THE STUDY

List of the 67 companies included in the study in alphabetical order. The companies are from the main list or from the I-list and they represent 11 different industries.

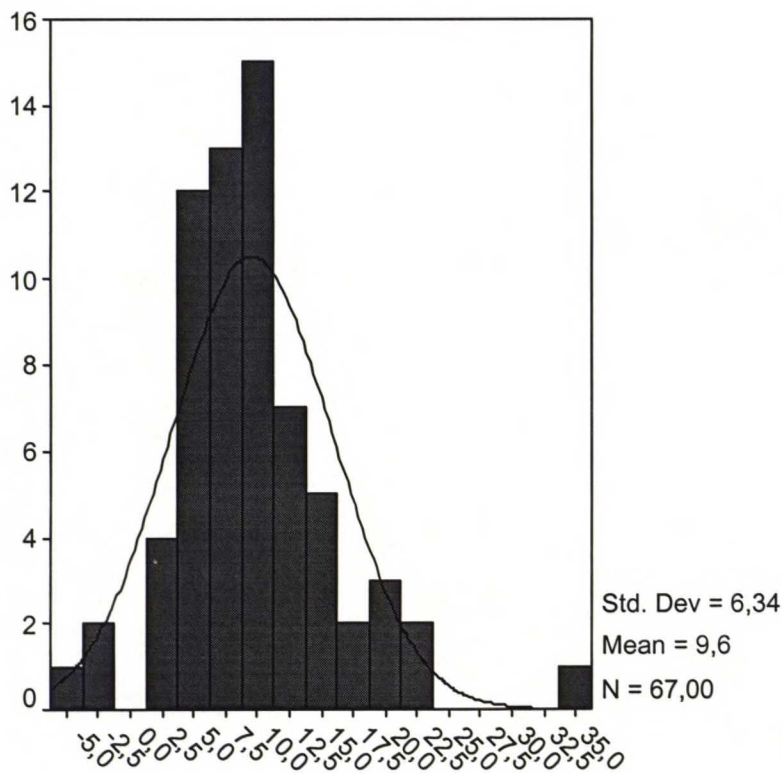
N:o	Name	N:o	Name	N:o	Name
1	Alma Media	24	Kesko	47	Rapala Normark
2	Amer	25	Kone	48	Rautakirja
3	Aspo	26	Kyro	49	Rautaruukki
4	Atria	27	Lassila & Tikanoja	50	Raute
5	Chips	28	Lemminkäinen	51	Rocla
6	Componenta	29	Leo Longlife	52	Sanitec
7	Evia	30	Lännen Tehtaat	53	Sanoma-WSOY
8	Exel	31	Marimekko	54	Silja
9	Finnair	32	Martela	55	Stockmann
10	Finnlines	33	Metso	56	Stora-Enso
11	Fiskars	34	Metsä-Tissue	57	Stromsdal
12	Hackman	35	M-real	58	Suomen Helasto
13	Hartwall	36	Nokian Renkaat	59	Suomen Spar
14	HK Ruokatalo	37	Nordic Aluminium	60	Talentum
15	Honkarakenne	38	Olvi	61	Tamfelt
16	Huhtamäki van Leer	39	Orion	62	Tamro
17	Ilkka	40	Outokumpu	63	Tulikivi
18	InCap	41	Partek	64	UPM
19	Jaakko Pöyry	42	Pohj. Karjalan Kirjapaino	65	Uponor
20	Kasola	43	Ponsse	66	Wärtsilä
21	KCI Konecranes	44	Raisio Yhtymä	67	YIT
22	Kekkilä	45	Rakentajain Konevuokraamo		
23	Kemira	46	Ramirent (aka A-rakennusmies)		

## APPENDIX 4: DESCRIPTIVE STATISTICS FOR ROA AND MV

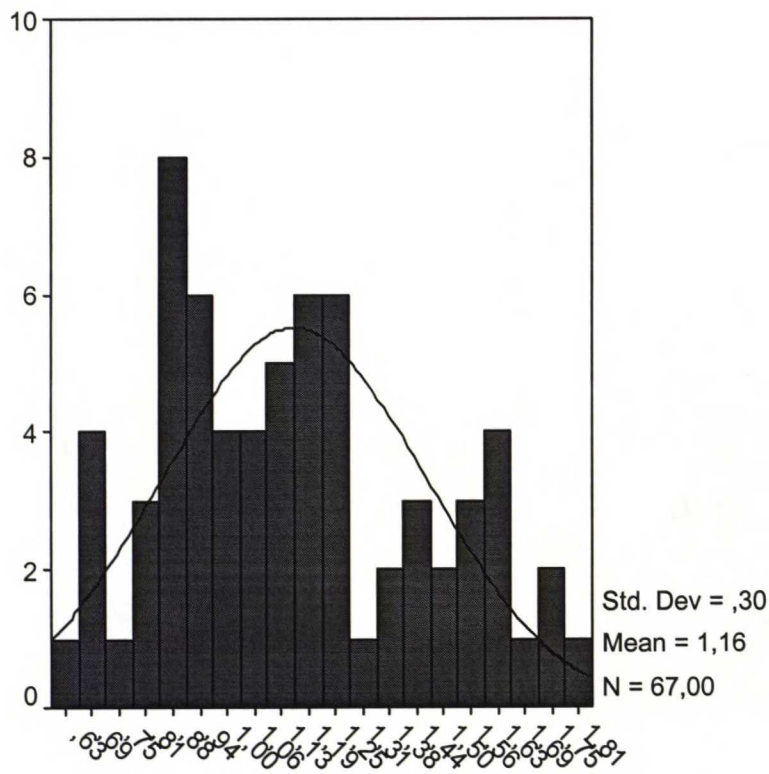
The descriptive statistics for Return on Assets (ROA) and market valuation (MV) multiple. ROA is calculated as EBIT / total assets (end of year) and MV is (market cap + debt) / total assets (end of year). The ROA figure is based on fiscal year that ended Dec 31, 2000 and MV is based on fiscal year 2000 for debt and total assets. Market cap is average value for the following dates 31.3.2000, 30.6.2000, 30.9.2000 and 31.12.2000. The sample includes 67 companies from HEX main list and I-list. The companies are 11 different industries excluding Banks & Finance, Energy, Insurance, Investment, and Telecommunications & Electronics.

	ROA	MV
Mean	9,6 %	1,22
Standard Error	0,8 %	0,05
Median	9,0 %	1,14
Standard Deviation	6,3 %	0,39
Kurtosis	3,03	-0,20
Skewness	0,97	0,85
Range	39,6 %	1,53
Minimum	-5,1 %	0,70
Maximum	34,5 %	2,23

APPENDIX 5: THE DISTRIBUTIONS OF ROA AND LNMV



ROA



LNMV

## APPENDIX 6: DESCRIPTIVE STATISTICS FOR EXPLANATORY VARIABLES

The descriptive statistics for variables used to explain company performance. The sample consists of 67 companies from main list or I-list of Helsinki Exchanges (HEX). The all variables except for DOMINS and DOMIND are gathered from the individual annual reports for fiscal year that ended 31.12.2000. DOMINS and DOMIND are taken from Karhunen & Keloharju (2000). Additionally, publicly available information is supplemented by personal correspondence with the companies and some ownership data is gathered from Arvopaperikeskus (Central Depository, subsidiary of HEX). The table also shows the 2-tailed Kolmogorov-Sminov test for normality of distribution, significant values marked with  $*(p<0.20)$ .

	INS	GREY	IND	OINS	OINDEP	OBOARD
Mean	19,0 %	4,8 %	76,2 %	6,2 %	20,7 %	26,9 %
Standard Error	2,6 %	1,3 %	3,0 %	1,7 %	2,8 %	2,8 %
Median	14,3 %	0,0 %	83,3 %	0,0 %	9,9 %	25,0 %
Standard Deviation	21,0 %	10,6 %	24,8 %	14,1 %	22,8 %	22,7 %
Kurtosis	2,59	4,80	0,98	5,22	-0,68	-1,18
Skewness	1,45	2,33	-1,22	2,51	0,81	0,32
Range	100,0 %	42,9 %	100,0 %	57,8 %	79,1 %	79,1 %
Minimum	0,0 %	0,0 %	0,0 %	0,0 %	0,0 %	0,0 %
Maximum	100,0 %	42,9 %	100,0 %	57,8 %	79,1 %	79,1 %
K-S test statistic	1,50	3,81	1,42	3,00	1,68	1,42
Significance	0,02*	0,00*	0,04*	0,00*	0,01*	0,04*

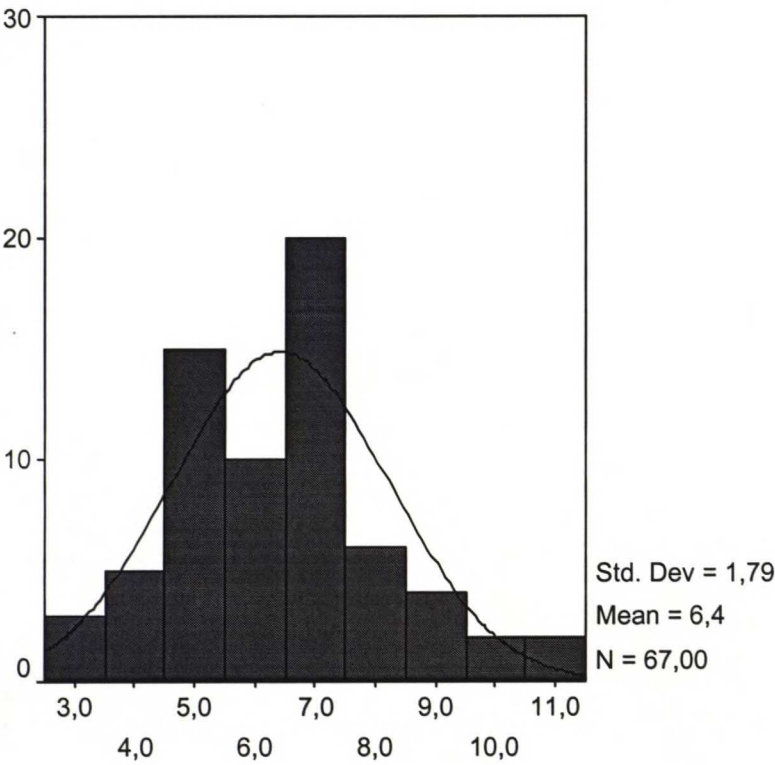
INS	Percentage of directors that are also employed by the company
GREY	Percentage of directors that are either former employees of the company or the relatives of current managers
IND	Percentage of directors that are independent from the management
OINS	Percentage of shares that insider directors control (personal, investment company, family member holdings)
OINDEP	Percentage of shares that independent directors control either directly or through their main occupation
OBOARD	Percentage of shares that directors control either directly or indirectly

	DOMINS	DOMIND	NBH	TNBH	BSIZE	RESE	LNSIZE
Mean	47,3 %	32,7 %	2,58	38,3 %	6,42	1,2 %	5,91
Standard Error	2,7 %	2,9 %	0,19	2,8 %	0,22	0,3 %	0,21
Median	49,2 %	26,8 %	3,00	40,5 %	7,00	0,0 %	6,18
Standard Deviation	21,8 %	23,6 %	1,54	23,1 %	1,79	2,2 %	1,68
Kurtosis	-0,70	-0,50	-0,83	-0,88	0,18	7,74	-0,89
Skewness	-0,01	0,70	0,00	-0,10	0,40	2,58	0,02
Range	91,4 %	88,9 %	6,00	84,9 %	8,00	11,2 %	6,72
Minimum	2,8 %	1,2 %	0,00	0,0 %	3,00	0,0 %	2,54
Maximum	94,2 %	90,1 %	6,00	84,9 %	11,00	11,2 %	9,26
K-S test statistic	0,61	1,14	1,11	0,67	1,34	2,31	0,70
Significance	0,85	0,15*	0,17*	0,76	0,06*	0,00*	0,71

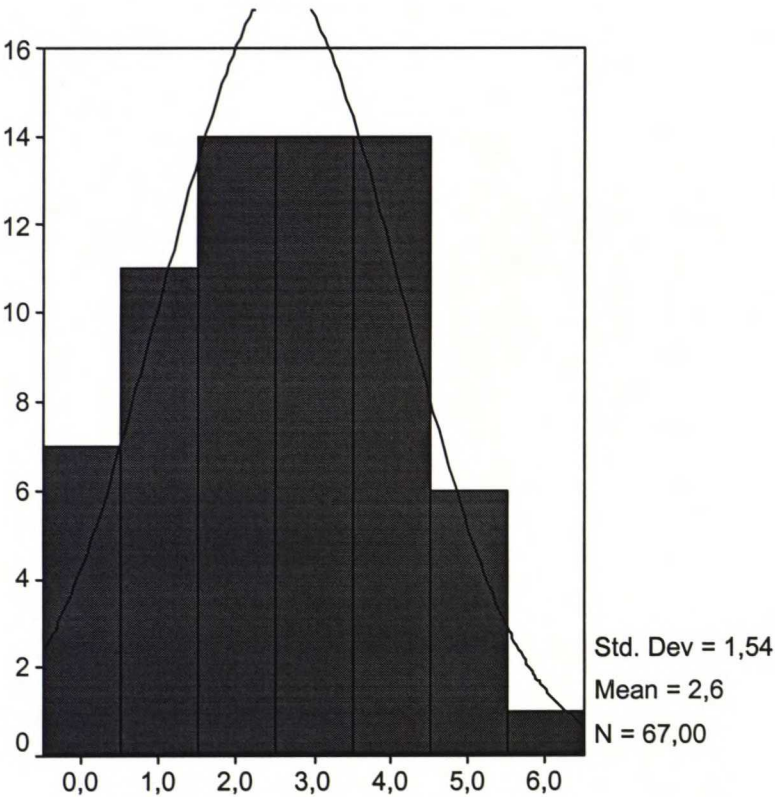
DOMINS	Percentage of shares that Finnish institutional investors hold in the company
DOMIND	Percentage of shares that Finnish individual investors hold in the company
NBH	Number of large shareholders who hold more than 5% of total shares
TNBH	Total percentage of shares that the large shareholders (defined as having above 5% of shares) have in the company
BSIZE	Number of directors on the board of directors
RESE	Annual R&D spending as a proportion of annual sales
LNSIZE	Natural logarithm of annual sales



APPENDIX 8: DISTRIBUTIONS FOR BSIZE AND NBH



BSIZE



NBH

## APPENDIX 9: RESULTS FROM REGRESSION EXPLAINING ROA AND LNMV

Table x: The results for linear OLS regression explaining company performance by board composition. The sample includes 67 companies from 11 industries listed on main list or on I-list at HEX. Return on Assets (ROA) and market valuation (MV) multiple are used as a metric for company performance. ROA is calculated as EBIT / total assets (end of year) and MV is (market cap + debt) / total assets (end of year). The ROA figure is based on fiscal year that ended Dec 31, 2000 and MV is based on fiscal year 2000 for debt and total assets. Market cap is average value for the following dates 31.3.2000, 30.6.2000, 30.9.2000 and 31.12.2000. The significance levels for the regressions are indicated by \* ( $p < 0,10$ ), \*\* ( $p < 0,05$ ) and \*\*\* ( $p < 0,01$ ). For collinearity the significance level is indicated by \* if tolerance is below 0.20 or VIF > 5.000.

### Panel A: LNMV

	Standardized coefficients	Test static	Significance	Collinearity	
				Tolerance	VIF
INS0-25	0,145	0,979	0,333	0,479	2,086
INS25-100	-0,083	-0,524	0,603	0,425	2,356
OINS1-30	-0,210	-0,871	0,388	<b>0,181</b>	<b>5,515</b>
OINS30-50	0,003	0,012	0,990	0,220	4,552
OINS50-100	0,173	1,226	0,226	0,531	1,883
BSIZE	-0,068	-0,357	0,723	0,294	3,404
SBOARD	-0,224	-1,545	0,129	0,502	1,991
OINDEP	-0,050	-0,375	0,709	0,590	1,696
Adjusted					
	R	R Square	R Square	F static	Significance
	0,717	0,514	0,302	2,429	0,007***

### Panel B: ROA

	Standardized coefficients	Test static	Significance	Collinearity	
				Tolerance	VIF
INS0-25	0,074	0,498	0,621	0,479	2,086
INS25-100	0,170	1,083	0,284	0,425	2,356
OINS1-30	0,012	0,051	0,959	<b>0,181</b>	<b>5,515</b>
OINS30-50	-0,115	-0,524	0,603	0,220	4,552
OINS50-100	0,008	0,060	0,952	0,531	1,883
BSIZE	0,128	0,676	0,503	0,294	3,404
SBOARD	-0,106	-0,734	0,466	0,502	1,991
OINDEP	0,048	0,362	0,719	0,590	1,696
Adjusted					
	R	R Square	R Square	F static	Significance
	0,719	0,516	0,306	2,455	0,004***

INS	Percentage of directors that are also employed by the company
INS0-25	Piecewise linear transformation of INS used to model curvilinear relationship for INS 0-25%
INS25-100	Piecewise linear transformation of INS used to model curvilinear relationship for INS 25-100%
OINS	Percentage of shares that insider directors control (personal, investment company, family member holdings)
OINS1-30	Piecewise linear transformation of OINS used to model cubic relationship for OINS 1-30%
OINS30-50	Piecewise linear transformation of OINS used to model cubic relationship for OINS 30-50%
OINS50-100	Piecewise linear transformation of OINS used to model cubic relationship for OINS 50-100%
BSIZE	Number of directors on the board of directors
SBOARD	Dummy variable that indicates if company has a supervisory board (value 1) or not (value 0)
OINDEP	Percentage of shares that independent directors control either directly or through their main occupation

## APPENDIX 10: RESULTS FROM REGRESSION EXPLAINING BSIZE

The results for linear OLS regression explaining board size by various ownership and board composition variables. The sample includes 67 companies from 11 industries listed on main list or on I-list at HEX. The significance levels for the regressions are indicated by \* ( $p < 0,10$ ), \*\* ( $p < 0,05$ ) and \*\*\* ( $p < 0,01$ ). For collinearity the significance level is indicated by \* if tolerance is below 0.20 or VIF  $> 5.000$ .

	Standardized Test		Significance	Collinearity	
	coefficients	static		Tolerance	VIF
IND	0,189	1,747	0,087*	0,489	2,044
SBOARD	0,089	0,841	0,404	0,513	1,950
NBH	0,245	2,345	0,023**	0,527	1,896
DOMINS	-0,236	-2,376	0,022**	0,581	1,721
OINS1-30	0,417	2,440	0,019**	<b>0,196</b>	<b>5,106</b>
OINS30-50	-0,355	-2,293	0,026**	0,239	4,185
OINS50-100	0,094	0,871	0,388	0,495	2,021
RESE	0,155	1,378	0,175	0,450	2,221

Adjusted				
R	R Square	R Square	F static	Significance
0,855	0,731	0,622	6,716	0,000***

IND	Percentage of directors that are independent from the management
SBOARD	Dummy variable that indicates if company has a supervisory board (value 1) or not (value 0)
NBH	Number of large shareholders who hold more than 5% of total shares
DOMINS	Percentage of shares that Finnish institutional investors hold in the company
OINS	Percentage of shares that insider directors control (personal, investment company, family member holdings)
OINS1-30	Piecewise linear transformation of OINS used to model cubic relationship for OINS 1-30%
OINS30-50	Piecewise linear transformation of OINS used to model cubic relationship for OINS 30-50%
OINS50-100	Piecewise linear transformation of OINS used to model cubic relationship for OINS 50-100%
RESE	Annual R&D spending as a proportion of annual sales

## APPENDIX 11: RESULTS FROM REGRESSION EXPLAINING IND

The results for linear OLS regression explaining board independence by various ownership and board composition variables. The sample includes 67 companies from 11 industries listed on main list or on I-list at HEX. The significance levels for the regressions are indicated by \* ( $p < 0,10$ ), \*\* ( $p < 0,05$ ) and \*\*\* ( $p < 0,01$ ). For collinearity the significance level is indicated by \* if tolerance is below 0.20 or VIF > 5.000.

	Standardized Test		Significance	Collinearity	
	coefficients	static		Tolerance	VIF
OINS1-30	-0,691	-3,608	0,001***	0,240	4,168
OINS30-50	0,175	0,919	0,363	0,242	4,126
OINS50-100	-0,325	-2,533	0,015**	0,536	1,865
SBOARD	-0,840	-0,707	0,483	0,619	1,616
TNBH	0,414	3,234	0,002***	0,536	1,865
DOMINS	-0,193	-1,521	0,135	0,545	1,834
RESE	0,285	2,097	0,041**	0,475	2,105

Adjusted					
R	R Square	R Square	F static	Significance	
0,760	0,577	0,419	3,644	0,000***	

OINS	Percentage of shares that insider directors control (personal, investment company, family member holdings)
OINS1-30	Piecewise linear transformation of OINS used to model cubic relationship for OINS 1-30%
OINS30-50	Piecewise linear transformation of OINS used to model cubic relationship for OINS 30-50%
OINS50-100	Piecewise linear transformation of OINS used to model cubic relationship for OINS 50-100%
SBOARD	Dummy variable that indicates if company has a supervisory board (value 1) or not (value 0)
TNBH	Total percentage of shares that the large shareholders (defined as having above 5% of shares) have in the company
DOMINS	Percentage of shares that Finnish institutional investors hold in the company
RESE	Annual R&D spending as a proportion of annual sales