Top management team and board attributes and firm performance in the Netherlands

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Abstract
We survey the evidence on the relationship between board and top management team attributes and firm performance in the Netherlands (sample of 94 listed firms). To this aim we develop hypotheses by using sources from the strategic management and the corporate governance literature. Dutch corporations generally have a two-tier board system. We use the size of the top management team (TMT) and their average age as well as the size of the supervisory board (RVC) and the percentage of outside members as attributes of corporate performance. Our base model consists of two performance indicators: a composite financial accounting measure (of ROA, ROS, and ROE) and a market-based indicator (standardized stock prize increase). Control variables are: log of total assets as an indicator of the size of a firm, leverage and adjusted cash flow/total assets as indicators of financial structure, coefficients of variation of sales and ROA as measures of environmental uncertainty (dynamics), and diversification as a measure of risk-spread. In general, we conclude for the year 1996, that by using the base model, direct linear and non-linear relationships between the TMT/board variables and performance are not existent. Also, the interaction effects with environmental dynamics as a moderating variable are tested. From this analysis it becomes evident that, although environmental uncertainty has a clear direct relationship with performance, it has no significance as a moderating variable. Only in one case the interaction with size of the board leads to a significant result. Indicating (instead of the hypothesized inverted U-shaped relationship) a U-shaped relationship between RVC and performance.
1 Introduction

Since the seminal work of Berle and Means (1932) the conflict between the owner and the manager of the firm is in the spotlight. If ownership is dispersed there will be a free-rider problem, leading to higher agency costs of capital and lower firm performance. In the last decade new attention is given to this issue of so-called corporate governance. How can a supplier of capital assure its fair returns? La Porta et al. (1998) review the alleged impact of differences in law and other institutions on the growth of firms. It appears that in some countries (especially the French law countries) protection of the shareholders is weak. This should undermine the control of the shareholder on the firm. In the French law countries capital markets are usually less developed than in common law countries. This implies that disciplining through takeover-threats is almost absent.

The owners of the firm can try to influence the quality of the board and through that the performance of the firm. It is known in the continental European economies that this is common practice. For instance in Germany, banks have a serious influence on board composition (see Edwards and Fischer, 1994). If owners do not have majority voting rights and a takeover-threat is not credible, the ultimate attempt to solve the agency problem is to maintain a relation of trust with the incumbent management team and to gradually increase the quality of the board. This policy assumes that the quality of the board positively influences firm performance. Although the quality of the board is also relevant to firms operating in more (hostile) market environments, shareholders do not have to worry as much as compared to more bank-based financial systems. Especially for continental European shareholders it is interesting to explore the board attributes-performance relationship. For instance, it could be in the interest of the supplier of capital (e.g. the bank) to monitor the firm and to appoint outside members on the (supervisory) board. It might also be the case that older top management teams have more management experience and use their human capital to obtain a better performance.

In this paper we analyze the impact of board attributes on firm performance in an economy, the Netherlands, where one would expect it to be relevant due to a lack of takeover-threat and voting power by shareholders. According to La Porta et al. (1998) the Dutch system has a relatively low score on shareholder protection, but a relatively high performance of firms. It is therefore a challenge to investigate the
influence of board attributes on firm performance. The Dutch economy provides an unique example in this respect with its two-tier board system. According to Dutch law a supervisory board is mandatory for most listed domestic firms. This means that in these firms an independent supervisory board is installed aside the top management team. To a certain extent, stakeholders can influence the composition of this board. In this respect the Dutch case differs to a large extent from its US or UK counterparts.

Most research regarding top management teams and the role of boards of directors has focussed, however, on single-boards in Anglo-Saxon firms (c.f. Boone et al., 1995). Shleifer and Vishny (1997) stand up for more comparative research in their survey on corporate governance. Following their argument, in this paper the Dutch case is subject of research. The main problem this paper addresses is the following question: are both top management team and supervisory board attributes related to firm performance? To answer this question, we exploit a data set of 94 Dutch non-financial firms that are to a large extent placed under the structural regime (see section 2), and are listed at the Amsterdam Exchange (AEX). We test for the impact of top management team and board size and composition on firm performance. Apart from the scientific challenge, the practical value of this paper is evident1. Board attributes are factors that can be directly controlled by management and supervisory boards them selves (Sanders and Carpenter, 1998). As such these variables can be considered as options in decision making.

The relevance of research at different attributes (such as age, size, composition) of these institutions is discussed from two different streams of literature. The upper echelon literature stresses the attributes of top management teams. In the tradition of the upper echelon research program proposed by Hambrick and Mason (1984) and Finkelstein and Hambrick (1996) much empirical research is performed related to attributes of top management teams2. This stream of literature concentrates mostly on the characteristics and functioning of top management levels in firms

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1 For example, see the case of Philips described by Metze (1997).
2 See for instance Norburn and Birley (1988); Eisenhardt and Schoonhoven (1990); Hambrick and Fukutomi (1991); Hitt and Tyler (1991); Hambrick and D'Aveni (1992); Michel and Hambrick (1992); Wiersema and Bantel (1992); Haleblian and Finkelstein (1993); Boone et al. (1995); Sanders and Carpenter (1998).
and not on governance aspects. The corporate governance literature is more oriented at monitoring (governance) and attributes of supervisory boards (Zahra and Pearce, 1989). Empirical research in this field is often based on research in the fields of finance and economics\(^3\).

The paper is organized as follows. In section 2, we first discuss the relevant theoretical insights and institutional context. After that we develop a set of hypotheses. In section 3 we deal with the sample, the research method, and the data. Section 4 presents the main results. Finally, in section 5 the conclusions with regard to the hypotheses are discussed.

2 Theory and hypotheses

2.1 Theoretical background

In this section different sets of literatures are shortly discussed. These literatures are to some extent complementary and stress different perspectives with regard to top management teams and boards.

From the point of view of the strategic management literature the strength of an organization depends on the ability to anticipate and respond to external threats and opportunities and internal pressures for change. By making strategic decisions, and initiating action (and change), top (or strategic) management responds to signals. Moreover, it anticipates current and future developments and trends and develops proactive policies and visions about its position in the market (Hamel and Prahalad, 1994). In the strategic choice perspective the nature and effectiveness of strategic choices are a function of the objective situation and the top management’s perception and interpretation capacities. As strategic choice assumes discretionary latitude for decision-makers in making strategic choices and a large behavioral

\(^3\) See for instance Bethel and Liebeskind (1993); Barnhart et al. (1994); Huse (1994); Sundaramurthy (1996); Daily and Dalton (1997); Bhagat and Black (1998). In different countries corporate governance is subject of special attention. In the UK, the Cadbury committee introduced a code of best practice. In the US the American Law Institute generated a 1500 page document with principles on corporate governance. In the Netherlands, a review committee, led by a former top-manager Peters, argued to give more power to the shareholder and to put more weight on the two-tier character of Dutch governance (c.f. report Committee Peters, 1997).
component, it reflects the idiosyncracies of decision-makers (Hambrick and Mason, 1984). Pfeffer (1983) indicates that, whereas organization theory often refers to subjective variables (such as norms and roles), more objective variables are empirically used, because they are facts that can be observed. Therefore, with respect to strategy formation and organizational performance, the point of view of the composition and role of management boards or top management teams (upper echelon) is often discussed by considering a set of (objective) demographic attributes (such as the age, organizational tenure, functional background, and education of top managers). There is empirical evidence that top management makes a difference (e.g. see Norburn and Birley, 1988; Wiersema and Bantel, 1992). However, this statement must also be considered with care. For example West and Schwenk (1996) failed to find a significant relationship between top management team demographics and performance. So, the idea of recognizing that top management teams are important for an organization’s performance and that they for this reason might be a valuable and scarce resource that would be hard for competitors to imitate (Collin, 1998), is still to be tested.

In the external control literature strategic decisions are considered as largely constrained by the external environment. For instance the ‘population ecology’ and ‘life cycle’ approach assume respectively relative inertia and little adaptation capacity of organizations (Boone et al., 1995). In this literature the one-sided impact of the environment is stressed. The environment determines the organizational context (and not the other way around). The strategic choice and external control perspectives, however, can be integrated (Hitt and Tyler, 1991), because both perspectives, more or less, take into account the influence of the environment on strategic decisions and/or performance. In this context we use the term upper echelon perspective (c.f. Hambrick and Mason, 1984, Finkelstein and Hambrick, 1996).

In the corporate governance literature the idea wins ground that it is in the shareholders interest to promote the development of long term relations, trust, and commitment amongst various stakeholders (OECD, 1998). In general, however, corporate governance is associated with the ‘principal-agent’ problem. This problem concerns the possible conflicts of interests of managers with those of the shareholders (investors). In this context the governance aspects of boards of
directors is an important part of the discussion. According to Goodstein et al. (1994) there are three perspectives related to the functional duties of the board. The first refers to the ‘resource dependency theory’ that emphasizes the institutional function in which the board helps to link the organization to its external environment and secure critical resources. The second refers to the governance function. Agency theory stresses that the board of directors can be considered as an internal governance and monitoring mechanism for alignment of shareholders and management, which can discipline or remove ineffective management teams (Barnhart et al., 1994). The implicit assumption of agency theory is that corporate boards of directors perform their governing function effectively (Sundaramurthy, 1996). The third function is the board’s contribution to the strategic decision making processes in organizations. Members of the board of directors are, to a certain extent, also actors in strategic decision making processes (Fama and Jensen, 1983). “The strategic role of the board involves taking important decisions on strategic change that help the organization adapt to important environmental changes” (Goodstein et al., 1994: 242). Given the relevance of these three functions of the board (networking, monitoring, strategic decision-making), different attributes of the board may be relevant for firm performance. Empirical studies in this field have focused on various board attributes, such as board size, insider/outsider ratio, board members’ stock ownership, board size, and CEO-duality in relation to firm performance (c.f. Rosenstein and Wyatt, 1990; Rechner and Dalton, 1991; Barnhart et al., 1994; Huse, 1994; Sundaramurthy, 1996; Daily and Dalton, 1997). However, a recent meta-analysis of Dalton et al. (1998) of 54 empirical studies showes, for the US-situation, that board composition (especially insiders vs. outsiders) virtually has no effect on firm performance. This result also asks for verification in other corporate governance systems (e.g. the Netherlands).

The upper echelon perspective is consistent with insights that managerial responsibilities are unlikely to be the exclusive domain of just one individual (Wiersema and Bantel, 1992: 92). The corporate governance perspective shows in this way the importance of the board of directors in governing and monitoring. Sanders and Carpenter (1998) discuss the relevance of a combined perspective in this respect, for example the size of a top management team may also have implications for the ability of the management team to manage complexity and for the ability of the supervisory board to manage the team (p.161).
The corporate governance structure of Dutch firms is special in a certain way. The structure is often seen as a device to limit the influence of the individual shareholder. For our purpose it is therefore necessary to discuss two key issues of the structure. Firstly, the impact of corporate governance on the management structure of most Dutch firms, and secondly, the role of this structure in the general view of defense mechanisms. We argue that the so-called structural regime allows for more external influence on the one hand, but restricts it on the other through co-optation. Furthermore, it seems that the structural regime is a substitute for other defense mechanisms.

Within Dutch firms, like in Germany, a two-tier corporate control mechanism is active: the top management team (the ‘Raad van Bestuur’: RvB) and the supervisory board (‘Raad van Commissarissen’: RvC). The top management team controls day-to-day operations. The chairman of the management team is the most prominent director and Chief Executive Officer (CEO). He is not involved with the supervisory board (no CEO-duality). The Dutch system of a supervisory board can be characterized by three models (Gelauff and Den Broeder, 1996) of which the structural regime is the most important one. Under conditions of the structural regime, the presence of a supervisory board is obligatory for limited liability companies with a subscribed capital of 25 million guilders, at least 100 employees in the Netherlands, and the presence of a workers council (companies that are a subsidiary of a structural holding are exempted). Gelauff and Den Broeder (1996) estimate 37 per cent of all Dutch public and private firms to be in this class. Of the listed companies two third belongs to the structural model. The members of the supervisory board are appointed by co-optation, members of the incumbent supervisory board elect new members. Top management (and especially the CEO) in practice substantially influences the composition of the supervisory board (Van der Goot and Van het Kaar, 1997). This is a crucial difference with for instance the German case where the shareholders elect the members of the supervisory board. The supervisory board ratifies important managerial decisions and it determines the annual statement of accounts (it also requires approval by the shareholders meeting). The supervisory board members may legally appoint and dismiss
members of the top management team, although this rarely happens (which is probably not a big surprise given the influence of management on the composition of the board).

*The mitigated structural regime* applies to those companies that meet the three criteria set out above, but are controlled by foreign companies. The foreign controlling company’s general meeting of shareholders approves the annual statement of accounts and composes the management board.

*The common regime* applies to the remaining companies. These companies may voluntary install a supervisory board. Generally, this board has less power and the shareholder meeting takes up the control of the account and the composition of the management board and supervisory board.

Our sample of listed firms generally falls into the category of the structural regime (77 out of 94 firms are under the structural regime; 23 took up this regime voluntarily, the remaining 17 firms are under foreign control and fall under the so-called mitigated structural regime). In this paper, by focusing on the relationship between at the one hand top management teams and supervisory boards and at the other hand firm performance, an indirect relationship with strategic decision making is assumed. For corporations it can be defended that both organizational top levels (top management teams and supervisory boards) are responsible for the ultimate performance of an organization.

Next, we turn to the role of the structural regime in limiting the influence of the individual shareholder. De Jong and Moerland (1999) show that the average number of defense instruments used by Dutch firms is 2 as opposed to 6 by US firms. The Dutch Monitoring Committee on Corporate Governance (1998) reviews the instruments to limit the influence of the individual shareholder as follows (apart from the structural regime):

1. The issuing of certificates of deposits through an administrative office. This implies that the voting power remains within the administrative office, since holders of certificates transfer their voting rights. In our sample 36 of the 94 firms use certificates of deposits.

2. Block ownership of the major stakeholder over 40 per cent. Of the 94 firms in our sample 21 firms have a large blockowner.
3. The issuing of priority shares through foundations. 22 of our 94 firms issued priority shares.

4. The issuing of finance prefs. This is a rather weak instrument and not considered to be a real powerful instrument to limit voting rights (see Monitoring Committee, 1998). 15 firms in our sample issued finance prefs.

5. The issuing of preference shares held by a continuity foundation as an anti-takeover instrument. 61 of our 94 firms use this instrument.

De Jong and Moerland (1999) show that the defense mechanisms are, to a large extent, substitutes for each other. This supports the findings of La Porta et al. (1998) about the relatively low score on shareholder protection in the Dutch situation (see section 1) and also underscores the importance of the supervisory board, as an alternative instrument for TMT control in the Dutch situation.

2.3 Hypotheses

Using the bases of empirical research of the preceding sections and taking into account the availability of data, we selected the following set of top management team (TMT) and board attributes: size, age, outsiders/insiders. In general, it is plausible to expect that the board and TMT attributes and performance/success are not specifically linearly related. A curvilinear (e.g. log or inverted U-shaped) relationship might be expected representing diminishing returns from a certain point.

Size

TMT size is likely to influence the strategic capacity of an organization. According to Haleblian and Finkelstein (1993), team size is often considered as a control variable. Empirical results show that large groups are more effective compared to smaller ones, because large groups have more problem-solving capabilities in the sense of a larger repertoire of problem sensing, interpretation, analyzing, evaluating, and solution capacities. These capabilities may enhance proactive strategic decision-making. This, however, comes at a price. Smaller groups tend to have less coordination and communication problems compared to larger groups,

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4 It is important to note that this research is based on secondary data. The application of other equally relevant variables like tenure and work experience is simply not possible, because of lacking data in this respect.
they also tend to be more cohesive and satisfactorily for their members, finally their decisions and consensus seem to be reached more efficiently (Haleblian and Finkelstein, 1993). Large groups are supposed to have greater information-processing and decision-making capabilities than small teams. Hambrick and D’Aveni suggested that "at a basic level, the resources available on a team result from how many people are on it" (1992: 1449). Note that in a small group the addition of one person can increase team heterogeneity substantially (Wiersema and Bantel, 1992). According to Hambrick and D’aveni (1992), inverted U-shaped relations indicate very small and very large groups having disadvantages. As size increases, it may become difficult after a certain point (size) for managers to reach decisions in a timely fashion.

**Hypothesis 1**: The size of the top management team and firm performance/success shows an inverted U-shaped relationship.

The same argumentation is valid for the size of the board. Zahra and Pearce (1989: 315) indicate that there is a threshold were board size may have a negative effect on company performance. Based on their arguments we hypothesize that the relationship between board size and company performance is nonlinear, representing an inverted U-shape.

**Hypothesis 2**: The size of the supervisory board and firm performance /success show an inverted U-shaped relationship.

**Age**

Norburn and Birley (1988) and Hitt and Tyler (1991) found that age influences strategic decision-making performance. According to Hambrick and Mason (1984) managerial youth appears to be associated with novelty, unprecedented actions, and risk-taking. This may be a consequence of the problems of older executives to integrate information in decision-making and that they tend to have less confidence in their decisions. Taylor (1975), however, indicates that this must be considered with care, because older managers also seek more information, evaluate

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5 One of the empirical results of Hitt and Tyler (1991:346) was that age and amount of work experience are highly interrelated, the effects are interwoven and may not be isolated. They therefore advise to consider the combined effects of these factors. In fact this research also confirmed the earlier findings of Taylor (1975), who found a high correlation between
information more accurately, and take more time to make decisions. Another explanation may be that flexibility decreases and rigidity and resistance to change increase as people age (Wiersema and Bantel, 1992). A third reason may be that financial and career security is more important for older managers (Wiersema and Bantel, 1992). The result is that older managers tend to be more conservative and lack the ambition or ability to provide direction for strategic change. Moreover, ageing top managers or executives seem to have difficulty to cope with corporate success or to continue success (Thorborg, 1987). In this case, also an inverted U-shaped relationship seems plausible.

Hypothesis 3: The average age of a top management team and firm performance/success shows an inverted U-shaped relationship.

Outsiders in supervisory board

Berle and Means (1932) were the first to study the implications of the separation between ownership and control in corporations. Next to provisions such as executive compensation contracts and equity ownership by managers, the supervisory board is one of the means to cope with this potential controlling- and incentive conflict (Mayers et al., 1997). In situations where agency costs between shareholders (owners) and management (control) may be severe, the supervisory board may play a crucial role (Barnhart et al., 1994). Especially, the proportion of independent outside directors in the board has been subject of research (c.f. Rosenstein and Wyatt, 1990; Lee at al., 1992; Barnhart et al., 1994). In this research mixed results varying from a weak to a strong relation between outside directors in the board and performance show up. For instance, Rosenstein and Wyatt (1990) find that the addition of outside directors is associated with increases in firm value. Rosenstein and Wyatt (1997) also conclude that there is no effect on appointment of new inside directors. Bhagat and Black (1997, 1998) conclude that there is no convincing evidence that board composition affects (future) performance. For past performance there is some evidence found. However, Klein (1998) shows that independent directors can add value if they are embedded in an appropriate committee structure. Barnhart et al. (1994) find that the proportion of independent outside directors has a significant (negative) curvilinear relationship

age and years of management experience (p.79). Accordingly, we don't consider experience separately, but focus on age (also because of availability of data).
with overall performance (market-to-book ratio). These arguments suggest that an inverted U-shaped relationship might be plausible.

_Hypothesis 4:_ The relative number of outsiders in the supervisory board and firm performance/success show an inverted U-shaped relationship.

Furthermore, a nonlinear relationship can be relevant to test the entrenchment hypothesis. If a board gets larger (till a certain point) it becomes more difficult for TMT-members not to behave in the firm’s interest. An inverted U-shaped relationship suggests an optimal size of the board in the sense of a maximum size.

Finally, environments differ in their degree of turbulence. The extent of discretion environments confer to TMTs (and boards) is dependent on the amount of complexity and uncertainty (Hambrick and Finkelstein, 1987). The larger the complexity and uncertainty, the more dynamic the environment will be. A dynamic environment asks for another composition of the TMT and/or board compared to a stable environment (c.f. Walton, 1998). Therefore, we expect environment (dynamic/stable) to be a moderating variable in this respect.

### 3 Data description and research method

We use a cross-section for 1996 of 94 Dutch listed firms at the A(sterdam Stock) EX(change). This sample largely consists of firms in the manufacturing sector. We focus on manufacturing firms and skip firms involved in services, to exclude effects due to different economic sectors. We include firms that only register their activity within the Netherlands, which leaves out for instance Royal Dutch Shell, the largest company in terms of total assets.

One of the crucial issues in analyzing firm performance is the precise measurement of performance. There is a wide list of possible indicators available. One can make a rough distinction in forward- and backward looking indicators. Forward-looking indicators use stock market information. One can think of market-to-book ratio’s (or Tobin’s Q), relative stock price increases or Economic Value Added (EVA) concepts (e.g. Zahra and Pearce, 1989); Barnhart et al., 1994). On the other hand one can use financial accounting data to indicate past performance. Often used indicators in this respect to measure firm performance or success are Return on Assets (ROA), Return on Sales (ROS), Return on Investment (ROI), or Return on
Equity (ROE) (e.g. Weiner and Mahoney, 1981; Hitt and Tyler, 1991; Rechner and Dalton, 1991; Michel and Hambrick, 1992; Wiersema and Bantel, 1992; Parnell, 1998). Dalton et al. (1998) discuss the pros and cons of both points of view. They conclude that there appears to be no consensus regarding the efficacy of reliance on one set of indicators (accounting-based) or another (market-based). Therefore, in this paper we exploit both points of view:

1. The standardized stock-price increase (SSPI);
2. A composite measure of Return on Assets (ROA), Return on Sales (ROS) and Return on Equity (ROE) (Perform).

In order to analyze the effect of board composition we need to condition the performance indicators on all relevant indicators (c.f. the models of Barnhart et al., 1994 and Chririnko et al., 1998). We use the log of total assets as an indicator of the size of the firm, leverage as an indicator of the capital structure, the ratio of cash flow to total assets as an indicator of the capacity of the firm to generate inside capital, a measure of diversification to condition upon the degree of risk aversion in selling end products in real markets and an indicator for environmental uncertainty. The latter variable might be seen from both an irreversibility point-of-view (having a negative impact) or from a real option view (leading to a positive impact on the growth of the firm). Moreover, we use industry dummies to correct for branch-specific effects.

Data is gathered from multiple sources: AMADEUS\(^6\), Bestuurders en Commissarissen (directors and supervisors), Handboek Nederlandse Beursfondsen (Financieele Dagblad)\(^7\), Jaarboek van Nederlandse Ondernemingen\(^8\), and REACH\(^9\).

For the balance sheet and income/loss-statement we use the AMADEUS-data set and the Handboek Nederlandse Beursfondsen. As a source for the TMT and board variables we used the Jaarboek van Nederlandse Ondernemingen, Handboek Nederlandse Beursfondsen (Financieele Dagblad), and Bestuurders en Commissarissen. In table 1 the variables are defined.

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\(^6\) AMADEUS is a data set covering over 200,000 firms in Europe.

\(^7\) This book contains data on 165 listed firms.

\(^8\) This book contains data on 187 listed firms.

\(^9\) This is the version of AMADEUS for the Netherlands.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform</td>
<td>The arithmetic average of the standardized Return on Assets (ROA), Return on Sales (ROS) and Return on Equity (ROE) (c.f. Venkatraman and Ramanujam, 1986)</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on assets: before-tax profits plus financial expense as a percentage of total assets (indicator for profitability)</td>
</tr>
<tr>
<td>ROS</td>
<td>Return on sales: before-tax profits plus financial expense as a percentage of total sales</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on equity: before-tax profits plus financial expense as a percentage of total equity</td>
</tr>
<tr>
<td>SSPI</td>
<td>The standardized stock-price increase of year 1996 compared to 1995</td>
</tr>
<tr>
<td>TOTAL ASSETS (TA)</td>
<td>Total assets minus depreciation (indicator for size) (LogTA is chosen to correct for large size; see also Mayers et al., 1997)</td>
</tr>
<tr>
<td>LEVERAGE (L)</td>
<td>Total assets minus equity as a fraction of total assets (indicator for financial structure)</td>
</tr>
<tr>
<td>CFA</td>
<td>Adjusted cash-flow = cash flow + depreciation</td>
</tr>
<tr>
<td>CFA/TA</td>
<td>Indicator for financial structure</td>
</tr>
<tr>
<td>Cv (ROA)</td>
<td>Coefficient of variation of ROA (cv (x) = stdev(x)/abs(mean(x)) 1992-1996</td>
</tr>
<tr>
<td>Cv (SAL)</td>
<td>Coefficient of variation of sales (cv(x) = stdev(x)/abs(mean(x)) 1992-1996</td>
</tr>
<tr>
<td>Environment DYN</td>
<td>Dummy variable, 0 = stable, 1 = dynamic (an indicator for environmental uncertainty: dynamic/stable environment). We compute the coefficient of variation (standard deviation over the absolute value of the mean) of sales to proxy for demand uncertainty and return on assets (= profitability in this paper) to proxy for profit uncertainty. The dynamics dummy is equal to 1 in case either of these coefficients is bigger than 0.5 (c.f. Haleblian and Finkelstein, 1993).</td>
</tr>
<tr>
<td>DIV</td>
<td>Percentage of non-core firm activities in industries at the two digit level (REACH). We define this variable as the percentage of non core activities of a total of 58 sub categories of activities/industries on the two-digit level, in which the firm is involved (c.f. Haleblian and Finkelstein, 1993). The 58 activity/industry categories are derived from the Dutch Chamber of Commerce BIK classification (a similar classification to the JEL classification).</td>
</tr>
<tr>
<td>Di i</td>
<td>0 is one of the 8 industry classes; to control for the effect of different industries</td>
</tr>
<tr>
<td>RvB</td>
<td>Number of members of each TMT</td>
</tr>
<tr>
<td>AGERVB</td>
<td>Average age of each TMT</td>
</tr>
<tr>
<td>RVC</td>
<td>Number of members of each supervisory board</td>
</tr>
<tr>
<td>OUTRVC</td>
<td>Percentage of external members of each supervisory board</td>
</tr>
</tbody>
</table>
Data analysis

We tested the hypotheses by conducting generalized-least-squares regression analysis. We estimated equations of the form: \( \text{PERFORMANCE} = f(X,Z) \) where \( \text{PERFORMANCE} \) (Perform, SSPI) denotes the performance variable, \( X \) is a set of our TMT/board variables and \( Z \) is a list of control variables. We tested for linear and nonlinear relationships. Robust-White standard errors are used to control for heteroscedasticity.

In order to get an impression of the data we give the descriptive statistics (sample means (\( \mu \)), median value (med), and standard deviation (\( \sigma \))) in Table 2.

Table 2 Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>( \mu )</th>
<th>Med</th>
<th>( \sigma )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform</td>
<td>0.00</td>
<td>-0.07</td>
<td>0.87</td>
</tr>
<tr>
<td>SSPI</td>
<td>0.00</td>
<td>-0.15</td>
<td>1.00</td>
</tr>
<tr>
<td>TA (10^6 DFL)</td>
<td>2674.46</td>
<td>482.04</td>
<td>7915.27</td>
</tr>
<tr>
<td>L</td>
<td>61.59</td>
<td>62.49</td>
<td>12.34</td>
</tr>
<tr>
<td>CFA/TA</td>
<td>16.61</td>
<td>16.46</td>
<td>6.80</td>
</tr>
<tr>
<td>Cv(SALES)</td>
<td>0.18</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Cv(ROA)</td>
<td>6.64</td>
<td>0.31</td>
<td>58.11</td>
</tr>
<tr>
<td>ENVIRON. DYNAMIC</td>
<td>0.34</td>
<td>0</td>
<td>0.48</td>
</tr>
<tr>
<td>DIVERSIFICATION</td>
<td>1.99</td>
<td>1.70</td>
<td>2.04</td>
</tr>
<tr>
<td>RVB</td>
<td>2.95</td>
<td>3</td>
<td>1.53</td>
</tr>
<tr>
<td>RVC</td>
<td>4.95</td>
<td>5</td>
<td>1.83</td>
</tr>
<tr>
<td>AGERVB</td>
<td>51.47</td>
<td>52.75</td>
<td>5.32</td>
</tr>
<tr>
<td>OUTSRVC (%)</td>
<td>84.30</td>
<td>100</td>
<td>19.94</td>
</tr>
</tbody>
</table>

Source: AMADEUS, Handboek van Nederlandse Beursfondsen, and REACH.

Note that the mean of Perform (consisting of the three standardized return indicators) is not a standard normally distributed variable. The size of the TMT ranges from 1-10, with a mean of 2.95. The size of the supervisory board range
from 2-11, with a mean of 4.95. The average age of the TMT ranges from 37-60, with a mean of 51.5. The fraction of outsiders in the supervisory board is 84.3%. The median value for Environment is 0, this reflects the distribution of the firms over the two categories of the dummy variable; 62 firms operate in a stable environment (0) and 32 operate in a dynamic environment (1). TA (representing the size of a firm) shows a median of DFL 2675 mln., a median value of DFL 482 mln., and a standard deviation of DFL 7915 mln., indicating a relatively high skewed distribution towards smaller firms. Cv(ROA) shows a relative volatile variation on ROA (period 92-96).

Table 3 presents the correlations among the key variables.

Table 3 Correlation matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perform</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SSPI</td>
<td>0.47a</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. logTA</td>
<td>0.20</td>
<td>0.17</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. L</td>
<td>-0.12</td>
<td>0.21b</td>
<td>0.28a</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CFA/TA</td>
<td>0.47a</td>
<td>0.26b</td>
<td>-0.05</td>
<td>-0.33a</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. DIV</td>
<td>0.05</td>
<td>0.08</td>
<td>0.21b</td>
<td>0.23b</td>
<td>0.07</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Envir.Dyn.</td>
<td>-0.47a</td>
<td>-0.12</td>
<td>-0.28a</td>
<td>-0.12</td>
<td>-0.15</td>
<td>-0.16</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. RVB</td>
<td>0.19</td>
<td>0.03</td>
<td>0.67a</td>
<td>0.17</td>
<td>0.03</td>
<td>0.11</td>
<td>-0.30a</td>
<td>0.30a</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9. AgeRVB</td>
<td>0.18</td>
<td>0.04</td>
<td>0.26b</td>
<td>-0.11</td>
<td>0.15</td>
<td>0.23b</td>
<td>-0.08</td>
<td>0.20</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10. RVC</td>
<td>0.10</td>
<td>0.18</td>
<td>0.78a</td>
<td>0.20</td>
<td>0.06</td>
<td>0.17</td>
<td>-0.08</td>
<td>0.046a</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>11. OutsRVC</td>
<td>-0.09</td>
<td>-0.10</td>
<td>0.05</td>
<td>0.09</td>
<td>-0.15</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
</tr>
</tbody>
</table>

a indicates significance at the 1% level
b indicates significance at the 5% level

Both performance indicators (Perform and SSPI) are significantly correlated. The size of the board of directors, the size of the TMT, the age of the TMT, diversification, leverage, and environmental dynamics show a significant correlation with size of the firm. CFA/TA is significantly correlated with Perform, SSPI and Leverage. Diversification is significantly correlated with Leverage and Age of RVB. Environmental dynamics is significantly negatively correlated with Perform, and size of RVB . RVC is significantly correlated with RVB.
4. Results
Starting from the base model (LnTA, L, DIV, CFA/TA, Environ. Dyn), we test both the linear and quadratic (for inverted U-shaped) relationships with respectively each of the TMT/Board variables. Also, we test these variables and relationships in Ln (natural log) – mode to account for differences within variables. The results are presented in table 4.

Table 4 must be interpreted as follows. In the columns 2-5 the parameter estimates are presented in which the TMT/board variables are simultaneously tested with the (control) variables of the base model. The general form of the equation is:
\[ \text{Perform}_i = \alpha_0 + \alpha_1 \text{TB}_i + \alpha_2 \text{TB}_i^2 + \Sigma \beta_j \text{C}_{ji} + \Sigma \gamma_j \text{D}_{ji} + \epsilon_i \]
Where Perform denotes firm performance, TB denotes either a TMT or a board variable, C_j is a conditioning model variable, D_j is an industry dummy and \( \epsilon \) a white-noise error term.

Table 4 Performance and TMT/Board variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.02</td>
<td>4.022</td>
<td>-3.104</td>
<td>71.73</td>
</tr>
<tr>
<td></td>
<td>(0.990)</td>
<td>(6.500)</td>
<td>(3.064)</td>
<td>(86.193)</td>
</tr>
<tr>
<td>LnTA</td>
<td>0.110</td>
<td>0.111</td>
<td>0.127</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>(0.082)</td>
<td>(0.0088)</td>
<td>(0.074)</td>
<td>(0.086)</td>
</tr>
<tr>
<td>L</td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>CFA/TA</td>
<td>0.046*</td>
<td>0.045*</td>
<td>0.048*</td>
<td>0.045*</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.016)</td>
<td>(0.015)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>DIV</td>
<td>-0.021</td>
<td>-0.035</td>
<td>-0.019</td>
<td>-0.030</td>
</tr>
<tr>
<td></td>
<td>(0.0042)</td>
<td>(0.045)</td>
<td>(0.041)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Environ. Dyn</td>
<td>-0.622*</td>
<td>-0.704*</td>
<td>-0.623*</td>
<td>-0.683*</td>
</tr>
<tr>
<td></td>
<td>(0.178)</td>
<td>(0.201)</td>
<td>(0.176)</td>
<td>(0.194)</td>
</tr>
<tr>
<td>RVB</td>
<td>-0.036</td>
<td>-0.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.056)</td>
<td>(0.133)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>RVC</td>
<td>-0.059</td>
<td>-0.327</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.057)</td>
<td>(0.193)</td>
<td></td>
</tr>
<tr>
<td>AGERVB</td>
<td>0.021</td>
<td>-0.169</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.017)</td>
<td>(0.261)</td>
<td></td>
</tr>
<tr>
<td>OUT</td>
<td>-0.001</td>
<td>0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.004)</td>
<td>(0.021)</td>
<td></td>
</tr>
<tr>
<td>RVB²</td>
<td>-0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.013)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RVC²</td>
<td>0.024</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.016)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGERVB²</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUT²</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LnRVB</td>
<td>-0.106</td>
<td>0.256</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.182)</td>
<td>(0.507)</td>
<td></td>
</tr>
<tr>
<td>LnRVC</td>
<td>-0.406</td>
<td>-1.995</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.275)</td>
<td>(1.163)</td>
<td></td>
</tr>
<tr>
<td>LnAGERVB</td>
<td>0.909</td>
<td>-38.546</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.836)</td>
<td>(44.413)</td>
<td></td>
</tr>
<tr>
<td>LnOUT</td>
<td>-0.071</td>
<td>1.445</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.223)</td>
<td>(3.867)</td>
<td></td>
</tr>
<tr>
<td>LnRVB²</td>
<td>-0.208</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.248)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LnRVC²</td>
<td>0.543</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.391)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LnAGERVB²</td>
<td>5.065</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.727)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LnOUT²</td>
<td>-0.188</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.485)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.402</td>
<td>0.391</td>
<td>0.407</td>
<td>0.397</td>
</tr>
<tr>
<td>F</td>
<td>4.901</td>
<td>3.988</td>
<td>4.986</td>
<td>4.067</td>
</tr>
</tbody>
</table>

Robust-White standard errors in parentheses. Industry dummies not reported.
* = significant at the 95% confidence level
Models 1 and 3 show the results of testing the linear relationships between performance (Perform), control variables, and TMT/board variables. Models 2 and 4 show the results of the nonlinearity models. Concerning the variables of the base model, we find the following results. Environmental dynamics consistently shows a significant negative impact on performance. This means that there is a negative relationship between environmental dynamics (uncertainty) and firm performance. CFA/TA shows a significant and positive relationship with firm performance. In general, the results for the TMT/board variables are not significant. The analysis is also performed for SSPI as performance indicator. The results show the same pattern. The statistical properties are even worse. For this reason they are not presented here.

We also tested for interaction effects with environmental uncertainty as a moderating variable. The model reads:
\[
\text{Perform}_i = \alpha_0 + \alpha_1 \text{TB}_i + \alpha_2 \text{TB}_i^2 + \sum \beta_j \text{C}_j + \sum \gamma_j \text{D}_j + \eta_i \text{TB}_i^2 \text{Environ.Dyn}_i + \lambda_i \text{TB}_i^2 \text{Environ.Dyn}_i + \epsilon_i
\]

In general, these results were insignificant. In this situation only the size of RVC is significant under conditions of a dynamic environment with a clear minimum as a threshold value (of about 6). This implies that firms with large boards perform better. Generally, the results do not improve by testing for interaction effects with environmental uncertainty as a moderating variable.

5 Conclusion and discussion of the results

The average and median values in general indicate no abnormal values for corporate activity. In table 5 the results of some other studies in this respect are shown.
Table 5: Descriptive statistics of empirical studies related to relevant variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Studies</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Hambrick &amp; D'Aveni (1992) (US)</td>
<td>Mean: 2.47</td>
</tr>
<tr>
<td></td>
<td>- Wiersema &amp; Bantel (1992) (US)</td>
<td>Mean: 11.72</td>
</tr>
<tr>
<td></td>
<td>- Halebian &amp; Finkelstein (1993) (US)</td>
<td>Mean: 2.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean: 4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean: 3.39</td>
</tr>
<tr>
<td>Average age TMT</td>
<td>- Wiersema &amp; Bantel (1992) (US)</td>
<td>42-69</td>
</tr>
<tr>
<td>Size of supervisory board</td>
<td>- Barnhart et al. (1994) (US)</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>- Mayers et al. (1997) (US)</td>
<td>12.4</td>
</tr>
<tr>
<td>Fraction outsiders in board</td>
<td>- Rosenstein &amp; Wyatt (1990) (US)</td>
<td>65.6%</td>
</tr>
<tr>
<td></td>
<td>- Lee et al. (1992) (US)</td>
<td>65.5%</td>
</tr>
<tr>
<td></td>
<td>- Hambrick &amp; D'Aveni (1992) (US)</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>- Barnhart et al. (1994) (US)</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>- Mayers et al. (1997) (US)</td>
<td>44% stock companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>72% mutuals</td>
</tr>
<tr>
<td></td>
<td>- Sundaramurthy et al. (1997) (US)</td>
<td>68.7%</td>
</tr>
<tr>
<td>TA</td>
<td>- Barnhart et al. (1994) (US)</td>
<td>Mean: 8969.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sd.: 20022.51</td>
</tr>
</tbody>
</table>

Comparison of the results of table 5 with the Dutch sample, shows that the firms in the US samples tend to be larger, that the fraction of outsiders tends to be smaller, and that the size of the supervisory boards of the US samples tends to be larger.
In general, we can conclude that by using the base model, direct linear and non-linear relationships between the TMT/board variables and performance are not existent. This is the case for two different performance indicators (a composite financial accounting indicator and a market-based indicator). When we evaluate these results in terms of the hypotheses of section 2.3 the hypotheses are in this respect not confirmed. This is in line with the results of West and Schwenk (1996) and the meta-study of Dalton et al. (1998).

Based on the results presented in table 4 we conclude that our constructed variable for environmental uncertainty, which we computed as a dummy out of the coefficient of variation of sales and of the return on assets has a clear negative impact on firm performance (the financial accounting indicator). This indicates that the extent of stability of the corporate environment is positively related to the success of the firm.

Also, the interaction effects with environmental dynamics as a moderating variable are tested. From this analysis it becomes evident that, although environmental uncertainty has a clear direct relationship with performance, it has no significance as a moderating variable. Only in one case the interaction with size of the board leads to a significant result. Indicating (instead of the hypothesized inverted U-shaped relationship) a U-shaped relationship between RVC and performance. The minimum of this U-curve is about 6, suggesting that this number of board members or more lead to better performance. This is contrary to our hypothesized optimal size of the board in the sense of a maximum (entrenchment hypothesis). A U-shaped relationship might be interpreted as follows: when the number of board members is relatively low (in this case < 6), there is probably little (outside) control, directors are probably well known to management, and therefore it is plausible that management actions have a negative influence on performance of the firm.

In general, we find no evidence for the effect of the composition of the board on firm performance. Apparently, in the Dutch context outsiders in supervisory boards do not have a significant impact on corporate performance. Perhaps this result is not quite surprising, as we observed in sections 2.1 and 2.3, the literature on this topic has produced rather mixed evidence as regards to the impact of outsiders in
supervisory boards. The (non) results of the meta–study of Dalton et al. (1998) are in this respect clearly confirmed. Furthermore, as most of the firms of our sample for the greater part have external members in their supervisory boards, it is also from a statistical perspective not a surprise that no significant impact on performance could be traced. A topic for subsequent research will be a more specific measurement of outside impact on firm performance. Also, the suggestion of Dalton et al. (1998: 284) to follow a potentially more promising avenue for future research might be fruitful: namely to address the board composition by digging into the relationship between subcommittee composition (e.g. audit, remuneration) and firm performance.

All in all, we characterize our results as very little evidence for the hypotheses postulated in section 2.3, but we consider this analysis a useful starting point for subsequent research at the relationship between TMT and board attributes and corporate performance in the Netherlands. Future research in this respect needs to cover a longer time period, to take into account more dynamical factors (and variability) and causality (c.f. Finkelstein and Hambrick, 1996).

Finally, we conclude that Dutch shareholders not only are ill-protected, but also cannot hope that they will have immediate higher expected returns by influencing the composition of the board. Reducing uncertainty that the firm faces is by far more efficient than changing attributes of supervisory boards. This leaves the question why Dutch firm performance is so prosperous without appropriate influence of shareholders still unanswered.
References


Opmerkingen/vragen m.b.t. paper
dd. 17 februari 1999

- Ik heb in de tekst een aantal vragen opgenomen, deze zijn vet weergegeven.
- Aan het basismodel van Chirinko et al. wordt Environment toegevoegd als afzonderlijke- en als interactievariabele.
- De hypotheses zijn nu geformuleerd als relaties tussen variabelen in de vorm van een ‘inverted U-shaped’ relatie. Is dit de beste manier? Of moeten we gewoon eerst van lineaire associaties uitgaan en die toetsen en vervolgens niet lineaire verbanden ook onderzoeken (zowel kwadratisch voor inverted U-shaped relaties als log-relaties)?
- De bedoeling is om voor alle hypotheses steeds systematisch dezelfde analyses te doen. Er is al wat voorwerk verricht (zie bijgaande setje van uitdraaien: deels ook gebruikt in huidige versie van het paper).
- Voor het vervolgpaper (Academy of Management-congres en Journal) moeten we bezien welke variabelen we nog toevoegen (zie bijvoorbeeld Spencer Stuart boekje: bevat 1996 data over 100 Nederl. boards) en de data van 1997 toevoegen. Dat wil ik ook wel doen!

Eenkele zaken om te onthouden:
- Dit soort onderzoek toevoegen aan ESR-verhaal (combinatie met AVW en Boone et al. UM)
- Postdoc of iemand anders moet databestand bijhouden
- Trust als variabele toevoegen?
It simply does not appear that there is any evidence of a substantive bivariate relationship between board composition and financial performance. Nor is there any evidence of moderating influences; these sub group analyses, too, are largely a function of a series of constructive replications based on samples drawn, with replacement, from the set of largest U.S. corporations.

Source: Dalton et al. (1998)
54 empirical studies
159 usable samples (80% sub sets of Fortune 500)
n=40,160
The non-findings of this research might be due to the limitations of cross-section research:
- The causality of the relationships might be the other way around. Performance in a certain year might lead to changes in TMT/board attributes (e.g. Barnhart et al., 1994).
- Also, the attributions of TMT/boards might influence strategic decisions and thereby indirectly performance. It is plausible that there is a time lag between the strategic decisions, the implementation of these decisions, and the results of these decisions (performance)