MASTER THESIS

INTERNAL CORPORATE GOVERNANCE MECHANISMS AND CORPORATE PERFORMANCE: EVIDENCE FROM DUTCH LISTED FIRMS

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Abstract

This study analyzes the impact of internal corporate governance mechanisms on firm performance of Dutch listed firms. The years 2012 and 2017 have been analyzed using OLS regressions. The results show that the effects on firm performance differ in how performance is measured. Board size is significantly related to firm performance; negatively for accounting-based and positively for market-based/hybrid measure Tobin's Q. For the number of outside directors on the board, the results were not robust enough to draw conclusions. Ownership concentration is significantly and positively related to accounting-based measures, but negatively to Tobin's Q. For insider ownership, which includes family and managerial ownership, no significant effects are found. Though, splitting up this variable into the two identities resulted in a positive relationship between family ownership and accounting-based firm performance measures. Lastly, this study finds significant positive effects of executive compensation on market-based performance measures and negative effects on accounting-based/hybrid performance measures. This study contributes to the scarce actual existing literature on this topic by using recent data from the Netherlands, and by including multiple corporate governance variables instead of only ownership structure, board structure or remuneration.

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1.   Introduction

Corporate governance interests have increased in the late 1990s and 2000s after several collapses and scandals of large corporations. Hence, the amount of studies about corporate governance and its mechanisms has increased. Corporate governance is often defined as a set of processes and structures for controlling and directing an organization (Abdallah & Ismail, 2017). It constitutes a set of rules, which governs the relationships between management, shareholders and stakeholders. Another definition is that corporate governance research addresses the nature of interactions and relationships between the firm and its stakeholders in the process of decision making and control over firm resources (Van Ees, Gabrielsson, & Huse, 2009). An important, and much discussed theory related to corporate governance is the agency theory, which discusses the conflicts of interests between management and shareholders. Research about this "separation of ownership and control" issue has extensively been done. Jensen and Meckling (1976) were one of the first and also the most cited authors. Agency problems arise within a firm whenever managers have incentives to pursue their own interests at shareholder expense (Connelly, Hoskisson, Tihanyi, & Certo, 2010). Corporate governance may help to reduce these agency problems and its costs. Firms with weaker governance structures have greater agency problems, and firms with greater agency problems perform worse.

Corporate governance includes internal and external mechanisms to direct, monitor and control firms. Internal mechanisms include board structure, executive compensation and ownership structure. Several studies argue that the board of directors and its composition has an essential role in monitoring management (Fama & Jensen, 1983). The independence of the board and its size are important determinants of board structure (Linck, Netter, & Yang, 2008). Furthermore, the level of compensation of executives on the board (also known as remuneration) may lower agency costs and therefore have a positive impact on firm performance (Ozkan, 2011). Nowadays, there is still public and even political debate about remuneration of directors of large corporations, and the directors' contribution to corporate performance. A third corporate governance mechanism is the ownership concentration and ownership identity. Short (1994) argues in his research that ownership structure has important implications for corporate governance and performance. Ownership structure is divided into two parts. Ownership concentration is the percentage of shares held by large shareholders and measures the power of controlling shareholders to influence managers. Shares of firms can be held by individuals, families or managers (often called insiders), but also institutions, other corporations, banks or governments. Those identities have implications for managers' objectives and the way they exercise their power, which is reflected in a company's strategy with regard to profit goals, dividends, capital structure and growth rates (Thomsen & Pedersen, 2000). Though, the effects of inside or outside ownership on firm performance are still not clear.

Several countries have enacted principles and codes to affect corporate governance. In 2003, the "Tabaksblat committee" led by Morris Tabaksblat was installed in the

Netherlands. In the same year, an accounting scandal of the Dutch multinational Ahold came to light and Royal Dutch Shell was sued for overstating its oil reserves a year later. Both scandals had a significant impact on the firms' stock price and annual results (NRC, 2003). In December 2004, the "Code Tabaksblat" was embed in the law. The code was subsequently revised on points as diversity, remuneration and transparency in 2008 and in 2016. The Dutch corporate governance code is established by the "Monitoring Commissie Corporate Governance" and is based on the Continental European code. The code has some country-specific differences in terms of shareholder versus stakeholder perspective (Ahmad & Omar, 2016). Therefore, it is difficult to generalize empirical evidence of studies from other countries with the Netherlands. This, combined with the scarce and dated research done about internal corporate governance mechanisms and its effects on Dutch firm performance, gives the opportunity for this research to reduce this gap.

1.1   Research objective and question

Looking at previous research, there is still no uniform and clear-cut answer on the question what the effects of the previously discussed internal corporate governance mechanisms are in the Netherlands. To get more clarity about this, the objective of this study is to examine the effect of internal corporate governance mechanisms on firm performance of Dutch firms, using recent data from firms listed on the Euronext Amsterdam. The following research question has been formed:

What is the impact of internal corporate governance mechanisms on the performance of Dutch listed firms?

1.2   Theoretical and practical relevance

Several studies have been carried out around the world. The effects of corporate governance mechanisms in Anglo-Saxon countries as the United States and United Kingdom are being investigated regularly. The outcomes may not be fully generalizable because of the different business climates and different corporate governance systems per country. Most studies focus only on one corporate governance mechanism itself, e.g. ownership structure (Anderson & Reeb, 2003; Demsetz & Villalonga, 2001; Douma, George, & Kabir, 2006; Florackis, Kostakis, & Ozkan, 2009; Krivogorsky, 2006; Maury, 2006; McConaughy, Matthews, & Fialko, 2001; Thomsen & Pedersen, 2000), board structure (Baysinger & Butler, 1985; Bonn, Yoshikawa, & Phan, 2004; Carter, D'Souza, Simkins, & Simpson, 2010; Conyon & Peck, 2002; Jermias & Gani, 2014; Joecks, Pull, & Vetter, 2013) or executive compensation (Duffhues & Kabir, 2008; Elston & Goldberg, 2007; Lee, 2009; Merhebi, Pattenden, Swan, & Zhou, 2006; Murphy, 1985). All three internal mechanisms together are less frequently investigated (Bhagat & Black, 1999; de Haan & Vlahu, 2016; Florackis, 2005; Mehran, 1995). Also, the empirical results about the impact of the mechanisms on firm performance are not all corresponding with each other. There is some research done in the Netherlands, regarding ownership structure (Donker, Santen, & Zahir, 2009; Frijns, Gilbert, & Reumers,

2007; Kabir, Cantrijn, & Jeunink, 2007; Roosenboom & van der Goot, 2005), executive compensation (de Jong, DeJong, Mertens, & Wasley, 2005; Duffhues & Kabir, 2008) and board structure (Marinova, Plantenga, & Remery, 2016; Postma, van Ees, & Sterken, 2003; Santen & Donker, 2009; van Ees, van der Laan, & Postma, 2008). Other researchers describe the context of the Dutch corporate governance code (Akkermans et al., 2007; Andres, Azofra, & Lopez, 2005; De Jong & Roell, 2005; Van Veen & Elbertsen, 2008). Some European studies also include the Netherlands in their dataset (La Porta, Lopez-De-Silanes, & Shleifer, 2002; Pedersen & Thomsen, 2003; Thomsen & Pedersen, 2000), however from these studies it is hard to understand the cross-national diversity of governance and its meanings and consequences (Aguilera & Crespi-Cladera, 2016). Also, the results from previous studies – especially about the Netherlands – are dated and might be deviate with the present through and the subsequent changes and revisions of the Dutch corporate governance code and different actual economic situations.

This study contributes to existing academic literature by giving an answer on the potential financial performance effects of internal corporate governance mechanisms with recent data from listed firms in the Netherlands. This may help to shed some light on the inconclusive evidence which was found in previous studies. It also contributes to existing literature by investing the Netherlands which is a continental European county, which is different than most previous studies concerning Anglo-Saxon countries. The practical relevance of this study is the knowledge to be gained, which is applicable for investors in the choice whether or not investing in a Dutch firm with that specific board structure, ownership structure or compensation policy. The results are also useful for current shareholders, board members or strategic managers in the choice of applying the most beneficial governance mechanisms.

1.3   Thesis outline
This structure of this study is organized as follows. After the introduction of chapter 1, the existing literature is reviewed in chapter 2 to get a better view of the different theories behind the topics involved in this study. Also, this chapter includes empirical evidence found in previous studies and formulates the hypotheses that will be tested during this study. In chapter 3 the research methodology is discussed, including the research design, the statistical model and the used variables. The data collection is discussed in chapter 4. Chapter 5 discusses the results of this study. Chapter 6 gives the conclusions and limitations of this study and recommendations for future research. The last pages of this study sum up the references and the show the appendices.

2.   Literature review

This chapter reviews existing academic literature concerning corporate governance mechanisms and its effect on firms. First, corporate governance is explained in general and further in specific for the Netherlands. Second, five relevant theories related to corporate governance are discussed. Third, the internal and external corporate governance mechanisms are discussed and empirical evidence is investigated and discussed. The last section includes the hypotheses that will be tested during this study.

2.1   Corporate governance

The concept of corporate governance incorporates several organizational functions as management, finance, accounting, business law, business ethics and economics simultaneously. It also deals with other corporate aspects like accountability, transparency, , disclosure, social responsibility, fairness and relationship among board of directors, shareholders and stakeholders (Ahmad & Omar, 2016). The definition is a socially constructed term that has evolved over time and depends widely on someone's view of the world (Aguilera, Desender, Bednar, & Lee, 2015). In general view, corporate governance is the system by which corporations are directed and controlled (Claessens & Yurtoglu, 2013). From a financial and stakeholder perspective, corporate ownership is often described as the structure of rights and responsibilities among the parties with a stake in the firm. In other words, it deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment (Shleifer & Vishny, 1997).

The Organization for Economic Cooperation and Development (OECD) was founded by 20 developed countries including the Netherlands, in 1961. In 1999, they created an influential guideline with corporate governance principles. Last revision of this report was, endorsed by the G20, in 2015. The OECD defines that "corporate governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined" (OECD, 2015, p. 9). The report can be used as a benchmark in corporate governance and the revision of 2015 takes in account developments in both the financial and corporate sectors that may influence the efficiency and relevance of corporate governance policies and practices.

In the U.S. the Sarbanes-Oxley Act was enacted in 2002. In 2004, the Netherlands followed with the "code-Tabaksblat" with the goal to improve transparency in firm's financial statements, better accountability towards the boards and strengthening control and protection of shareholders.

Researchers have found that good corporate governance mechanisms have a positive influence on firm performance, especially in firms where ownership and control are separated (Aggarwal, 2013; Bhagat & Bolton, 2008). These results are in line with the agency theory. Abdallah and Ismail (2017) found a positive relationship between governance quality and firm performance which is maintained and is stronger at low levels of concentrated

ownership. Some researchers found that corporate-governance ratings and performance has become weaker over time. This may suggest that the governance of companies does not have to be regulated by law, but can be left to the "invisible hand" of the market (de Jong et al., 2005; Renders, Gaeremynck, & Sercu, 2010).

The agency model proposes a number of corporate governance mechanisms that are designed to reduce agency cost associated with the separation of ownership and control (Fama, 1980; Jensen & Meckling, 1976; Weir, Laing, & McKnight, 2002). The governance mechanisms to reduce agency costs can be divided into internal mechanisms and external mechanisms (Weir et al., 2002). Internal mechanisms include board structure and composition, executive compensation, and ownership structure. When internal mechanisms have failed, the market for corporate control serves as an external mechanism (Daily, Dalton, & Cannella, 2003). These external mechanisms control the external stakeholders' exercise over the organization.

2.1.1   Corporate governance models
In corporate governance, two basic models exist around the world; the Anglo-Saxon model and the Continental European model. The models differ on several aspects and some countries have made some country-specific adjustments, though they basically originate from one of the two models. The models are discussed and compared below. Table 1 gives an overview of the differences between the two models.

Anglo-Saxon model
The Anglo-Saxon model is originally the corporate governance system of the United States and the United Kingdom. The prime responsibility of corporate managers' is to maximize shareholders' wealth, as they bear the risks as owners. Shareholders are represented by the board of directors which are usually single-tiered, and composed of mostly non-executive directors who have been elected by shareholders. The model is characterized by arm's length relationship between the corporations (the board) and the investors (shareholders) (Ahmad & Omar, 2016). Firms from countries with an Anglo-Saxon corporate governance model have often a dispersed ownership. Several reasons explain this phenomenon. Anglo-Saxon countries are bigger and have a larger number of firms, which allows investors to spread their investments. Also, these firms are bigger which means that a high ownership share represents incredibly large amounts of capital (Cernat, 2004; Ooghe & de Langhe, 2002; Thomsen, 2003). In the Anglo-Saxon model is a broad delegation to management of corporate responsibilities, since shareholders do not have significant power with their share. Minority shareholders, however, enjoy protection from legal infrastructure and highly developed capital markets in the market-oriented system (Cernat, 2004).

Next to the outlined agency problems, highly dispersed ownership can create free-rider problems (de Haan & Vlahu, 2016), which means that one shareholder take advantage of other shareholders that have actively invested in monitoring activities in the firm. In Anglo-Saxon countries, bank-ownership is not allowed or avoided. By strictly separating

these banking activities and imposition of stock markets, and the individualism and profit-oriented behavior, the Anglo-Saxon model is more short-term orientated (Cernat, 2004).

Continental European model

The Continental European model is applied in mainland European civil-law countries like the Netherlands, Germany or France. The model differs from the Anglo-Saxon model in different perspectives. The Continental European model takes the stakeholder theory more in consideration and focusses more on insider and outsider stakeholders' wealth. Despite this, shareholders still have great power since in blockholder ownership is applicable and ownership is highly concentrated in continental European countries. Continental European firms are more likely to be a family business with high ownership concentration (Pedersen & Thomsen, 2003). A negative point of high ownership concentration is that it can lead to expropriation of minority shareholders' wealth. However, it can improve firm performance by controlling managers' discretion (Jara-Bertin, López-Iturriaga, & López-de-Foronda, 2008). The continental European model raises external finance to greater extend from banks and other financial institutions (Ahmad & Omar, 2016; Cernat, 2004). Banks are also allowed to own a significant proportion of shares in their portfolios as a way to control their major clients' economic activities. The organizational features and interaction with banks allow firms to seek higher profits in the long term. The model incorporates two-tiered board of directors, which exists of an executive board and a supervisory board. The formation of boards differs per country.

Table 1: Anglo-Saxon versus Continental European corporate governance model

	Anglo-Saxon	Continental European
Corporate purpose	Maximization of shareholder wealth	Maximization of stakeholder wealth
Ownership structure	Widely dispersed ownership; dividends prioritized	Families, banks and other corporations are major shareholders; dividends less prioritized
Role of banks	Banks play a minimal role in corporate ownership	Important both in corporate finance and control
Family-controlled firms	General separation of equity holding and management	Family ownership important only for small- and medium-sized enterprises
Management boards	One-tier board	Two-tier boards; executive and supervisory responsibility separate
Market for corporate control	Hostile takeovers are the 'correction mechanism' for management failure	Takeovers restricted
Role of stock exchange	Strong role in corporate finance	Reduced
Rights and interest	Protect the rights and interest of shareholders, dividend prioritized	Protect the rights and interests of stakeholders too
CEO duality	Permitted	Not permitted
Nature of management	Management dominated	Controlling shareholders dominated
Management boards	One-tier board	Two-tier board

Adapted from Cernat (2004) and Ahmad (2016).

2.1.2 Corporate governance in the Netherlands

In the Netherlands, the corporate governance code is adapted from the Continental European model. The "code-Tabaksblat" or "Nederlandse Corporate Governance Code" was enacted in 2004, and the last revision was in 2016. The code is a code of conduct which is mandatory for listed firms in which the "comply or explain" approach applies. This means that companies should follow these rules, and in case they do not, they have to explain on which point they deviate and why. According to the Dutch Monitoring Committee Corporate Governance (2016) the purpose of the code is to "facilitate – with or in relation to other laws and regulations – a sound and transparent system of checks and balances within Dutch listed companies and, to that end, to regulate relationships between the management board, the supervisory board and the shareholders" (p. 7). The code applies to all companies whose registered offices are in the Netherlands and whose shares are traded on a regulated or comparative market, which are listed firms. It also applies to large companies (balance sheet value above €500 million) whose shares have been admitted to trading on a multilateral trading facility or comparable systems. The latest version of the Dutch corporate governance

code is a set of 24 principles to provide guidance for effective cooperation and management. The principles include different aspects like long-term value creation, effective management and supervision, remuneration, the general meeting and one-tier governance structure. CEO duality is not permitted in the Netherlands. Dutch firms applied traditionally two-tier boards, consisting a management board (Raad van Bestuur) in charge of the day-to-day operations of the firm and a supervisory board (Raad van Commissarissen). Unlike other continental European countries, members of the supervisory board are elected by themselves and the supervisory board is responsible of its own performance (Van Veen & Elbertsen, 2008). Outside parties like shareholders and employees do not have influence on this. Since 2013, one-tier boards are also allowed. A condition for one-tier boards is that the board should consist of executive and non-executive directors, and only an non-executive director may perform the duties of a chairman (MCCG, 2016).

The last revision of the Dutch corporate governance code of 2016 takes long-term value-creation more in account and includes culture as part of good corporate governance. The code is also actualized on other smaller points, e.g. a target male/female ratio of board members. The Netherlands Authority for the Financial Markets (AFM) must be informed if shareholders hold 3% or more of the shares in a public company. Public companies in the Netherlands are called "nv's", which corresponds with commonwealth countries' "limited companies", and "incorporations" in the United States. Some Dutch firms use dual-class ownership by issuing next to common shares, preference shares or priority shares. Those types of shares are used for shareholders to receive a fixed or cumulative preferred return. Another reason to issue other types of shares is to prevent hostile takeovers. Due to the different types of shares, there might be a difference between control rights and cashflow rights in a firm. The different types must be stated in the annual report, together with the percentage of shares – with a minimum of 3% – owned per shareholder.

For Dutch firms, the remuneration policy applicable to management board members should be clear and understandable, should focus on long-term value creation for the company and its affiliated enterprise, and consider the internal pay ratios within the enterprise (MCCG, 2016). It prevents management board members to act in their own interests and considers risk in accordance with the firms' strategy and risk appetite. The supervisory board is responsible for formulating the remuneration policy and its implementation. The remuneration of the supervisory does not depend on the performance of the firm, because it should promote adequate performance of a member's role. Therefore, the supervisory board should submit a proposal for its own remuneration to the general meeting.

Akkermans et al. (2007) found a high level of compliance within the code in the Netherlands. They also found evidence that compliance is positively associated with company size. In terms of non-compliance, remuneration, independence of board members and the requirements of internal control stand out.

2.2   Five underlying theories

To explain the possible effects of different ownership structures on the financial performance of a firm, a multi-theoretic approach is used. These five theories have been discussed in many other previous studies, and are also relevant for this research.

2.2.1   Agency theory

One of the much-debated and basic issues in contemporary corporate governance has been the agency problem (Ahmad & Omar, 2016). Jensen and Meckling (1976) define as one of the first a theory in which the "separation of ownership and control" issue is described. This so-called agency or principal-agency theory is based on the circumstance that agents or managers might not act the same as their principals. They do not only represent the interests of the principals. Moreover, in some cases they put their own interests first. There is information asymmetry between the principal and agent and the principal is not fully capable of checking them. Fama (1980) states that in these theories, a firm is viewed as a set of contracts among factors of production, with each factor motivated by its self-interest. The insight of this theory is that this set of contracts leads to self-interests, however keeping in mind the survival of the team in its competition to other teams.

The terms "owner" and "principal" are used interchangeably. To close this briefly; an owner becomes a principal when they contract with executives to manage their firms for them. To measure the "separation between ownership and control", agency costs constitute a suitable scale. In the original Jensen and Meckling theory (1976), a zero agency-costs base case is by definition the firm owned by a solely by a single owner-manager. When management owns less than 100 percent equity, agency cost will incur which harms the performance of the firm.

Eisenhardt (1989) argues that agency theory is concerned with resolving two problems. The first problem is the agency problem that arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing. Second, the problem of risk sharing that arises when the principal and agent have different attitudes towards risk.

Agency conflicts can be mitigated by monitoring, however investors with small holdings may not take an active role in monitoring management. In widely-held firms the free-rider problem can arise because shareholders will not be informed well enough and refrain from investing their personal resources in monitoring activity (Grossman & Hart, 1980; Holmstrom, 1982). Large shareholders provide a solution for this by having a big enough stake that it pays for them to spend private resources to monitor management (Shleifer & Vishny, 1986).

Regarding situations with contracting problems, agency problems consist of moral hazard and adverse selection. Moral hazard refers to the problem of inducing agents to supply proper amounts of productive inputs when their actions cannot be observed and contracted for directly (Holmstrom, 1982). Adverse selection refers to the misrepresentation of ability by the agent (Eisenhardt, 1989).

Madison et al. (2016) stated that agency theory results in pro-organizational outcomes, improved performance is realized by cost minimization. Douma, George and Kabir (2006) postulated the impact of various ownership categories on firm performance using the twin dimensions ownership identity (inside or outside) and ownership magnitude (dispersed or concentrated). The model, represented in figure 1, considers both traditional (developed economy) issues as unique agency (emerging economy) issues. Quadrant 1 represents dispersed-outside shareholders. These shareholders are postulated as moderate because they have limited ability to monitor due to the higher coordination costs and asymmetry problems. Quadrant III is postulated as moderate performance as well. Inside-concentrated shareholders usually result in stronger incentive to efficiently manage the affairs of a firm, which provides opportunities and means for expropriation of minority shareholders (Claessens, Djankov, & Lang, 2000). Quadrant II represents dispersed-inside shareholders. This combination does not have positive consequences for the impact on performance and is therefore postulated as inferior, because "it distorts their incentive structures and compromises their ability to undertake an effective monitoring exercise" (Douma et al., 2006, p. 639). Quadrant IV has the most impact on performance with concentrated-outside shareholders and is therefore postulated as superior. These shareholders are capable of excluding free-riders and successfully maximizing benefits of risk bearing, incentive alignment and monitoring.
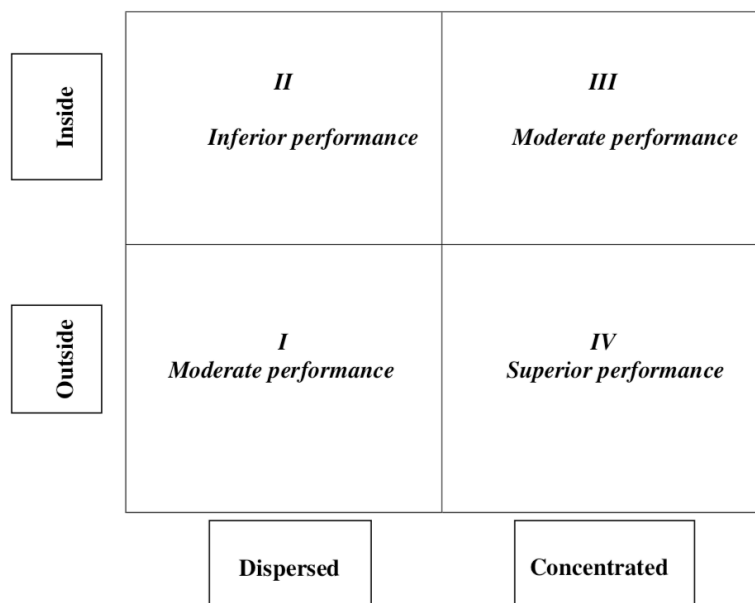
Source: Douma et al. (2006, p. 639)

Figure 1: Ownership–performance relationship quadrants viewed from agency theory.

2.2.2 Stewardship theory

Stewardship theory was designed for researchers to examine situations in which executives as stewards are motivated to act in the best interests of their principals. In stewardship theory, the model of man is based on a steward whose behavior is ordered such that pro-organizational, collectivistic behaviors have higher utility than individualistic, self-serving

behaviors (Davis, Schoorman, & Donaldson, 1997). According to the stewardship theory, a steward's behavior will not depart from the interests of the organization, which is the opposite of the agency theory. Davis et al. (1997) describes that "a steward's behavior will not depart from the interests of his or her organization. A steward will not substitute or trade self-serving behaviors for cooperative behaviors" (p. 24).

Le Breton-Miller, Miller and Lester (2011) found in their research that both agency as stewardship views have application, but it depends on different circumstances. As the amount of family directors, officers, and generations grow, and as family control and vote dispersion increases, stewardship behavior wanes off. Firms with less generations and owners are less likely to have agency behavior.

The most powerful benefit associated with owner management derives from the stewardship motivations of the leader (Miller & Le Breton-Miller, 2006). For family business owners and managers or leaders who are often called "insiders", the stewardship perspective argues that they will act as farsighted stewards of their companies, investing generously in the business to enhance value for all stakeholders (Bubolz, 2001; Miller & Le Breton-Miller, 2005), and creating an enduring and robust enterprise (Arthurs & Busenitz, 2003). Madison et al. (2016) state that stewardship theory increases performance by way of wealth maximization as pro-organizational outcomes.

2.2.3 Stakeholder theory

The term stakeholder in an organization refers to "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). Mitchell, Wood and Agle (1997) are more specific and argue that a stakeholder is a kind of entity which can be persons, groups, neighborhoods, organizations, institutions, societies, and even the natural environment are generally thought or qualify as actual or potential stakeholders. The stakeholder theory states that not only the shareholders, but all stakeholders are interested and involved in a firm's decisions. Donaldson and Preston (1995) state in their research that stakeholder theory includes three interrelated aspects; the stakeholder theory is unarguably descriptive, instrumental, and normative.

External stakeholders may have different goals and interests than internal stakeholders. Employees want a good salary and good working conditions, while investors demand for growth, profitability and low investment risk. The degree in which managers give priority to competing stakeholders' claims is called stakeholder salience. The purpose of the stakeholder theory is to create as much as value as possible for all stakeholders. Jensen (2010) believes that managers should build a proper relation between value maximization and stakeholder theory, which he calls enlightened value maximization. Looking at performance, Jensen (2010) states that this theory increases the total long-run market value of the firm. Corporate behavior will get the most out of society's limited sources, not whether one group is or should be more privileged than another. This is, however, difficult for boards of directors and executives, because it leaves them with no principled criterion for decision making.

2.2.4 Resource-based theory

The resource-based view theory (abbreviated as RBV) states that "strategic" resources are the key differentiators between firms that have advantages vis-à-vis those that do not (Kellermanns, Walter, Crook, Kemmerer, & Narayanan, 2016). These "strategic" resources must be valuable, rare, inimitable, and non-substitutable in order to sustain the firm's competitive advantage. The board is an essential link between the firm and the essential resources that it needs to maximize performance (Salancik & Pfeffer, 1980). The resource-based theory was first fully described by Barney (1991) and remain interesting for researchers in the organizational sciences. The theory was intended to help researchers understand why some firms (mostly larger and more established firms) enjoy a competitive advantage, and thereby outperform other firms.

The resource-based theory is often applied thanks to its simplicity and its immediate face validity. The core message is appealing, easily grasped, and easily taught, however the RBV has also been extensively criticized for many weaknesses. These can be concluded by saying that RBV has clung to an inappropriately narrow neoclassical economic rationality and has thereby diminished its opportunities for making further progress (Kraaijenbrink, Spender, & Groen, 2010). Looking at performance, if the board is capable of making a high level of links with the external environment, it is associated with high access to resources and, consequently, high corporate performance. In turn, in case of low-level links, it would result in lower outcomes (Nicholson & Kiel, 2007).

2.2.5 Institutional theory

Institutional theory is concerned with regulatory, social, cultural influences that promote survival and legitimacy of an organization rather than focusing solely on efficiency-seeking behavior (Bruton, Ahlstrom, & Li, 2010). The theory includes, different than e.g. agency or resource-based theory, the social context within the firm's activities are embedded. Table 2 compares the institutional theory with the agency theory. The key idea is that organizational practices arise from imitative forces and firm traditions. The pattern of doing these things evolves over time. People are not busy with fulfilling their own interests, they are legitimacy-seeking satisfiers. According to the institutional theory, traditions, legislation, social and political beliefs, founding conditions that comprise the institutional context are points that are considered to organize the organization in a legitimate way. Advantages of institutional theory is the ability of a firm to expand or enhance its competitive advantage in particular markets. The theory may have significant influence on performance because of the type and use of organizational capabilities and the connection with mode choice (Brouthers, 2002).

Table 2: Comparison of agency and institutional theories

	Agency theory	**Institutional theory**
Key idea	Organizational practices arise from efficient organization of information and risk-bearing costs	Organizational practices arise from imitative forces and firm traditions
Basis of organization	Efficiency	Legitimacy
View of people	Self-interested rationalists	Legitimacy-seeking satisficers
Role of environment	Organizational practices should fit environment	A source of practices to which organization conforms
Role of technology	Organizational practices should fit technology employed	Technology moderates the impact of institutional factors or can be determined institutionally
Problem domain	Control problems (vertical integration, compensation, regulation)	Organizational practices, in general
Independent variables	Outcome uncertainty, span of control, programmability	Industry traditions, legislation, social and political beliefs, founding conditions that comprise the institutional context
Assumptions	People are self-interested People are rational People are risk-averse	People satisfice People conform to external norms

Source: Eisenhardt (1988, p. 491)

2.3   Internal corporate governance mechanisms

Internal mechanisms for corporate governance are a set of controls to monitor activities and take actions to accomplish organizational goals. In previous studies, internal mechanisms are often associated with the board structure, remuneration or executive compensation, and ownership structure (Chung, Kim, Park, & Sung, 2012; Florackis, 2005). These are being discussed, and further substantiated with empirical evidence below.

2.3.1   The board

The board of directors is an important part of the governance structure of large corporations. Corporate boards fulfill three roles (van Ees et al., 2008). First, they have to deal with institutional factors, as described in the institutional theory. Second, boards have an internal governance and monitoring role and discipline or remove ineffective management teams. Third, the board should make strategic decisions. The board of directors are typically elected and composed by the shareholders at annual meetings. According to the agency theory, boards will arise as a control mechanism when there is separation of ownership and control.

One of the main themes in corporate governance codes concerns the way in which boards of directors ought to be structured to generate independent control (van Ees et al., 2008). Independence is found to be of prime importance in most European codes. To structure the corporate boards, two board systems exist around the world; a one-tier and two-tier board. Some firms – especially with one-tier boards – apply CEO duality, which increases independence. Other variables which may influence corporate decisions are differences in board characteristics. Observable examples of these differences are gender, age, tenure, race and ethnicity. Unobservable or examples that are difficult to measure can be knowledge, education, values, perception, affection and personality characteristics (Erhardt, Werbel, & Shrader, 2003).

The board of directors may assign specific tasks to sub-committees. The most important are the audit, remuneration and nomination committees (Carson, 2002). The audit committee is mandatory or heavily advocated in many corporate governance codes of countries. In the Netherlands, if the supervisory board consist of more than four members, it should appoint from among its members an audit committee, a remuneration committee and a selection and appointment committee. The audit committee is responsible for "undertaking preparatory work for the supervisory board's decision-making regarding the supervision of the integrity and quality of the company's financial reporting and the effectiveness of the company's internal risk management and control systems" (MCCG, 2016, p. 16). The remuneration committee task is to submit a clear and understandable proposal to be pursued in terms of remuneration for the management board. The selection and appointment committee's duty is to prepare the supervisory board's decision-making and report to the supervisory board on its deliberations and findings.

The different systems, structure and composition of the board and its impact are discussed below.

2.3.1.1 One-tier board system versus two-tier board system

A one-tier board is single board system, consisting of executive and non-executive directors. The advantage of a one-tier board is the better understanding and involvement in the business by the board, faster decision-making process and a superior flow of information. In one-tier boards it is common to apply CEO duality. A second chairman should create an extra objective monitor (Krause, Semadeni, & Cannella, 2014) The primary disadvantage of one-tier boards is that it has to simultaneously make and monitor the same decision. One-tier boards are common in Anglo-Saxon countries. Since 2013, however, it is allowed to choose this board structure in the Netherlands.

Two-tier board employs dualism of an internal management or executive board, and a separate, external supervisory board. Advantages of a two-tier board are the better monitoring and the control by the independent supervisory board (Maassen & Bosch, 1999). The executive board – which includes the CEO – is responsible for managing the company and realizing its goals in the best interests of the stakeholders. The supervisory board is responsible for monitoring and advising the executive board, again with all stakeholders in mind (Van Veen & Elbertsen, 2008). Two-tier boards are traditionally more common in continental European countries, especially Germany. Jungmann (2007) analyzed the differences between the one-tier and two-tier board systems and found that both systems are effective means of control. The researcher was not able to assign superiority to either of the systems.

2.3.1.2 Board size

Board size is about the number of people on the board. There is no clear-cut answer on the question what the optimal size of the board of directors is. Firms with strong insider control, or with a founder CEO, tend to have smaller boards (Bhagat & Black, 1999). In smaller boards, there might exist substantial personal relationships with the board members. Larger boards are less affected by this. Therefore, board size is sometimes associated with board independence. Smaller boards benefit from more efficient communication and coordination, and therefore better monitoring. Larger boards benefit from the greater collective information, including knowledge and experience that the board possesses (Guest, 2009). Regarding agency theory, larger boards are not desirable since small boards have more managerial control.

2.3.1.3 Outside directors on the board

The board is represented by inside and outside directors. Outside directors are non-executive or supervisory directors and do not interfere with daily operational decisions. Outside directors monitor and advise the executive directors. Outside directors bring valuable expertise and potentially important connections (Fama & Jensen, 1983). Outsiders face stronger pressure to demonstrate their capabilities, and thus have more incentives to manage earnings, especially in their early years. The presence of outside directors increases

independence of the board and may also influence non-economic considerations such as environmental awareness and community involvement. Therefore, outside directors may enhance the reputation of the company (Kang, Mandy, & Gray, 2007). Balsmeier, Buchwald and Stiebale (2014) argue that outside directors with professional background provide valuable specific knowledge and expertise to the board and found evidence that outside directors have a positive impact on firm innovativeness.

The agency theory suggests that an independent board, being free from the influence of firm management, would be effective in monitoring the firm's management. Stewardship theory has a different view on outsiders, arguing that outsiders do not have enough knowledge of the strengths and weaknesses of the firms to be able to provide any useful counsel (Davis et al., 1997). The theory suggest that the assignment of board chair should go to the CEO so that the firm has unified control and command system (Gaur, Bathula, & Singh, 2015).

2.3.1.4 Foreign directors

Foreign independent directors (FID) bring valuable international expertise and advise to firms, especially those with significant foreign operations or plans for overseas expansion (Masulis, Wang, & Xie, 2012). FIDs can give firms first-hand knowledge about the foreign market and enables the firm to create a network of foreign contacts. FIDs can also advice in terms of local business, social and political circles.

Disadvantages of foreign directors are less effective in overseeing management, which could weaken a board's monitoring and disciplining role. Foreign directors with a large geographic distance from corporate headquarters cause substantial costs and making visits more difficult and time-consuming. Also, foreign directors with that geographic distance do not receive valuable soft information from local networks and they can be not familiar with the local accounting rules, laws and regulations, governance standards and management methods (Masulis et al., 2012).

2.3.1.4 Tenure

Tenure is the length of time that a CEO or other board members performs their duties in the firm. CEOs in early tenure years are likely to be labeled as inexperienced. The market cannot accurately judge the ability of a CEO at the beginning of his tenure, especially when the CEO does not have previous experience as a CEO. An advantage of new CEOs is that they are highly attuned to the external environment, since they have been selected specifically for their fit with current conditions. Long-tenured CEOs are more experienced having unique and non-transferable knowledge about the firm and the industry. They are also more committed to the firm. Long-tenured CEOs become increasingly committed to earlier policies, and through time these CEOs hire other like-minded executives who reinforce the CEO's entrenched point of view (Henderson, Miller, & Hambrick, 2006). The isolation and entrenchment are disadvantages of long tenure.

2.3.1.5 Gender diversity and age of board members

Another issue concerns the appointment of women to board, or in more general words the ratio male/female members of the board. Several countries have applied in their national corporate governance code a mandatory percentage to encourage the appointment of female directors. The Netherlands include in their latest revision of the corporate governance code a percentage of at least 30% of female board members (MCCG, 2016). The ratio is a target figure since no sanctions have yet been imposed. Francoeur (2008) looked at an agency perspective at gender diversity and suggest that "women (like external shareholders, ethnic minorities, and foreigners) often bring a fresh perspective on complex issues, and this can help correct informational biases in strategy formulation and problem solving" (p. 84). Female board members are more likely to take active roles on their boards and are more likely to ask questions, debate issues and display participative leadership and collaboration skills and generally hold their organizations to higher ethical standards (Terjesen, Couto, & Francisco, 2016). Male members are expected to be more assertive and aggressive. They also found to be more confident and risk-taking (Carter et al., 2010; Khan & Vieito, 2013). The diversity of perspectives of male and female directors can enhance overall creativity and innovation with respect to problem solving (Terjesen et al., 2016).

Next to gender, the age of directors may also have impact on corporate decisions. Older board members can provide experience, wisdom, and usually the economic resources. The middle age group carries the major positions of active responsibilities in corporations and society. The younger group has the energy and drive to succeed and plan ahead for the future (Kang et al., 2007).

2.3.1.6 Empirical evidence of the impact of board structure on firm performance
Board size

Looking at studies that investigated the impact of board size on firm performance, a negative impact is often found. For UK firms, Florackis (2005) and Guest (2009) found a strong negative relation between board size and firm performance (using Tobin's Q) and suggest that smaller boards are more efficient than larger boards. Cheng (2008) found that larger boards have lower variability of corporate performance.

Andres, Azofra and Lopez (2005) found in their research including 450 non-financial OECD countries a negative relationship between firm value and the size of the board of directors. The relation holds after controlling for board composition and country and industry effects. Also, other previous studies concerning European firms found negative effects of large boards (Conyon & Peck, 2002; O'Connell & Cramer, 2010).

For the Netherlands, Postma, van Ees, and Sterken (2003) found a negative relation between the size and composition (number of outsiders) of the supervisory board and firm performance. They found no relation between the size of the management board and firm performance.

Outside directors

Van Veen and Elbertsen (2008) found that Dutch boards on average consist of more executive members that German or UK firms (35,6% executive and 64,4% non-executive). Allgood and Farrell (2000) found evidence that outside directors hires experience a probationary period, followed by a period of apparent entrenchment during their intermediate years that weakens later in their tenure. Previous research found mostly negative effects of outside (sometimes called independent) directors on corporate performance. Guest (2009) found a significant negative relation between the number of outside directors and firm performance, measured by Tobin's Q, ROA and share returns. Jermias and Gani (2014) agree and add that CEO duality has an negative impact as well. Stein and Zhao (2019) also found that the number of outside directors has significant negative impact on firm performance and value, and especially on small boards. O'Connell and Cramer (2010) found contrary evidence; a positive relation between the number of outside directors and firm performance. Duchin, Matsusaka and Ozbas (2010) found that the effectiveness of outside directors depends on the cost of acquiring information. When the cost of acquiring information is low, performance increases when outsiders are added to the board, and when the cost of information is high, performance worsens when outsiders are added to the board. Faleye, Hoitash and Hoitash (2011) found that monitoring quality improves when a majority of independent directors, however this comes at significant cost of weaker strategic advising and greater managerial short-term focus. In the end, the costs are higher than the better monitoring quality which leads to lower firm-value.

Carter et al. (2010) found a positive relationship between the presence of foreign non-executive directors and financial distress. They suggest that this is caused by negative communication and misunderstandings.

For the Netherlands, Postma, van Ees, and Sterken (2003) found a negative relation between the size and composition (number of outsiders) of the supervisory board and firm performance.

Foreign directors

Masulis et al. (2012) found that firms with foreign independent directors on the board exhibit significantly poorer performance, especially as their business presence in the foreign directors home region becomes less important. Douma et al. (2006) found positive effects of foreign ownership on performance and add that this is substantially attributable to foreign corporations that have, on average, larger shareholding, higher commitment, and longer-term involvement. Oxelheim and Randøy (2003) also found a positive relation.

Gender diversity and age of board members

Results from empirical research investigating the impact of gender diversity and age of board members are inconclusive. Numerous studies found positive effects of gender diversity on firm performance measured by Tobin's Q, MBV or ROA (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Conyon & He, 2017; T. Miller & Triana, 2009; Post & Byron, 2013; Smith, Smith, & Verner, 2006). Some researchers add that country-specific factors like

shareholder protections, market performance and gender parity might influence the effects. There is less, but also evidence for a negative relation between gender diversity and firm performance (Ali, Ng, & Kulik, 2013; Shehata, Salhin, & El-Helaly, 2017). For Germany, Joecks, Pull and Vetter (2013) found a negative impact, but only after a "critical mass" of about 30% women has reached. The researches argue that there exists a U-shape link. In terms of financial distress, Santen and Donker (2009) found no relationship between the gender of a director and financial distress. Carter et al. (2010) found no evidence for any relationship between gender and ethnic minority diversity of the board and firm performance of major US corporations.

Looking at the age of directors, the findings are inclusive as well. Horváth and Spirollari (2012) found that younger members of the board of directors tend to be more risk taking and undertake more structural changes to improve firm's future prospects. They found a positive relation between age and firm performance. Bonn (2004) found no evidence of any relation between board size, directors' age and firm performance. Bonn, Yoshikawa and Phan (2004) found a negative relation between age of directors and firm performance in Japan, and a positive relation between female director ratio and firm performance in Australia. Ali et al. (2013) found an inverted U-shaped curvilinear relationship between age diversity and return on assets.

Marinova, Plantenga and Remery (2016) found in their dataset of 186 listed Danish and Dutch firms also no relation between firm performance and board diversity (age supervisory director and gender).

Tenure

Previous research on CEO or other executives' tenure on the board do not have similar outcomes. In several studies there is a relation found between CEO tenure and firm performance. Henderson et al. (2006) found in their longitudinal study that in stable industries firm-level performance improved steadily with tenure. In contrast, in dynamic industries firm performance declined steadily across CEOs' tenures. Mcinyre, Murphy and Mitchell (2007) also found positive correlations between tenure of board members and firm performance. Results from the study of Allgood and Farrell (2000) suggest a constant negative relation between firm performance and forced turnover throughout an inside CEO's tenure. Brookman (2009) also found that tenure increases with performance, and also found a positive relation with compensation and a reduction of monitoring by the board. Nelson (2005) argues that firms with poor performance are more likely to change governance practices that better performing firms. They found evidence that CEO age, tenure or compensation not have influence on corporate governance practices. Looking at the tenure of board members, Huang and Hilary (2018) found an inverted U-shape relation between firm value and accounting performance and board tenure.

2.3.2 Executive compensation or remuneration

Executive compensation or remuneration is the compensation for an executive's service to the organization, and can be composed of financial and non-financial rewards. In the Netherlands, the MCCG prescribes that the remuneration committee in a firm should submit a clear and understandable proposal to the supervisory board concerning the remuneration policy to be pursued with regard to the management board. The supervisory board should present the policy to the general meeting for adoption.

Remuneration is a corporate governance mechanism to align the interests of managers with those of shareholders to minimize problems regarding agency theory (Duffhues & Kabir, 2008). Thomsen and Conyon (2012) argue that executive compensation exist of four broad elements; an annual salary, an annual bonus, equity compensation in the form of stock options and restricted stock, and other benefits in the forms of retirement pay and perks. Executive compensation exists of fixed and variable compensation. Fixed compensation is in the form of a basic salary, and variable compensation includes bonuses. Short-term compensation includes the base salary and any bonus plan based on last year performance (Goergen & Renneboog, 2011). Long-term compensation includes stock options, restricted stock, and long-term incentive plans. Thomsen and Conyon (2012) argue that a typical CEO bonus plan, found in many companies, can easily lead to unintended but nevertheless predictable CEO behavior. Murphy (1985) measured remuneration as salary and bonus, stock-options, deferred compensation and stock awards and found a positive influence on shareholder return and sales growth. The intention of remuneration is to encourage executives to focus on long-term value creation and avoid that they act in their own interests, or take risks that are not in line with the strategy of the firm. Two different views on executive compensation can be found in the literature; the optimal contracting view and the managerial power view (Thomsen & Conyon, 2012). The optimal contracting view implies that the firm's owners design a contract that makes management rewards contingent upon firm performance to solve the moral hazard problem. The agency theory provides the underlying logic for 'pay-for-performance' plans in organizations. Any variable that yields information about executive effort may be used in the compensation contract. Thus, in the optimal contracting view, markets ultimately determine executive compensation. In the managerial power view, the CEO set pay in their own rather than shareholder interests, which is in contrast to the optimal contracting view and agency theory. The manager power view happens when boards are 'weak' compared to the CEO. The boards can be seen as 'weak' when they are too large or directors on the boards serve on too many on other boards making them too busy to be effective monitors (Thomsen & Conyon, 2012).

Lee (2009) found that larger firms make great use of performance-based remuneration. Sales revenue is likely to be used as a yardstick for determining performance pay. Remarkable is that Duffhues and Kabir (2008) found no positive impact between firm performance and executive compensation in the Netherlands. They believe that collusion between blockholders and management may cause "pay-for-no-performance". In the past,

strong criticisms were made on the high compensation of top executives of many well-known firms despite the meager results. Therefore, stricter transparency about remuneration in annual reports is included in the Dutch corporate governance code (MCCG, 2016).

2.3.2.1 Empirical evidence of the impact of remuneration on firm performance

Florackis (2005) and Florackis and Ozkan (2009) found strong evidence that managerial ownership and managerial compensation work as substitute mechanisms in mitigating agency problems and therefore, generating good performance. Result from other studies seem to correspond. Positive relations between firm performance and compensation are found in the UK (Ozkan, 2011), US (Brick, Palmon, & Wald, 2006; Conyon, 2014), Australia (Merhebi et al., 2006), China (Conyon & He, 2017) and Germany (Elston & Goldberg, 2007). Mehran (1995) also found evidence that the form, rather than the level of compensation motivates managers to increase firm value. Nelson (2005) found no relation between executive compensation and firm performance.

2.3.3 Ownership structure

A firm's owners are "those persons who share two formal rights: the right to control the firm, and the right to appropriate the firm's residual earnings" (Hansmann, 1988, p. 269). These formal rights are often used to elect the firm's board of directors, which makes the owners less able to "control" their firm, or in familiar references, it creates the "separation of ownership and control". Ownership structure can be divided into two parts; ownership concentration and ownership identity. Ownership concentration is about the number of shareholders per firm, and ownership identity about who the shareholders are.

2.3.3.1 Ownership concentration

Ownership concentration has to do with the amount of stock owned by individual investors and large block shareholders (investors that hold at least 5 per cent of equity ownership within the firm). Demsetz and Villalonga (2001) argued that ownership concentration is the percentage of shares held by the firm's most significant shareholders, which can be measures as blockholders, the top five shareholders or controlling shareholders. There is a difference between voting (control) rights and cashflow rights. Voting rights allows shareholders to vote for several corporate issues, while cashflow rights only gives rights for receiving returns. Shareholders can use voting as a channel of communication with boards of directors, and protest voting can lead to significant changes in corporate governance and strategy (Yermack, 2010). Thomsen and Pedersen (2000) argues that ownership concentration measures the power of controlling shareholders to influence managers. In other words, the more shares a single shareholder own, the more voting rights and thus influence on corporate decisions. Shleifer and Vishny (1997) identify concentrated ownership as an essential element of a good corporate governance system. Large shareholders will have a stronger incentive to monitor managers and more (voting) power to

enforce their interests and this should increase the inclinations of managers to maximize shareholder value. When ownership is concentrated to a degree that one owner (or a few owners acting in concert) has effective control of the firm, the nature of the agency problem shifts away from manager– shareholder conflicts. In widely-held firms (low concentrated or diffused ownership), shareholders will most likely not be informed well enough and refrain from investing their personal resources in monitoring activity. This is often referred as the free-rider problem (Grossman and Hart, 1980; Holmstrom, 1982).

As described earlier, Continental European countries as the Netherlands have high concentrated ownership. In Western Europe, typical firms are widely held or family controlled. Financial and large firms are more likely to be widely held, while non-financial and small firms are more likely to be family controlled (Faccio & Lang, 2002). Frijns et al. (2007) argue that continental European countries are also characterized as highly concentrated, however Dutch firms to a lesser extent. They add that still, Dutch firms have higher ownership concentration than Anglo-Saxon countries. Kabir et al. (2001) found that the average ownership stakes of the largest and the three largest shareholders are 27% and 41% respectively. They also observe that voting rights are more concentrated than ownership rights, and that the average ownership stakes of banks, financial institutions and insurance companies are relatively low.

2.3.3.2 Ownership identity

In the research of ownership structure, much attention has been paid on how insiders versus outsiders can affect firm performance. Thomsen and Pedersen (2000) distinguished in their study five identity types of European firms; institutional investor ownership, family ownership, bank ownership, corporate ownership, government ownership. The identity of the owners has implications for their objectives and the way they exercise their power, which is reflected in a company's strategy with regard to profit goals, dividends, capital structure and growth rates. Firms can be owned by insiders or outsiders (Connelly et al., 2010). Insider ownership is often defined as the percentage of shares of a company hold by its managers (Anderson & Reeb, 2003; Gugler, Mueller, & Yurtoglu, 2008). Kaserer and Moldenhauer (2007) argue that this does not apply in non-Anglo-Saxon countries, because in these countries ownership seems to be mainly driven by management's compensation contracts. Therefore, they argue that continental European countries are different, because insider ownership is often related to family control, stock-based compensation is less widespread, and the market for corporate control is less developed. These researchers and some other researchers (Frijns et al., 2007; Pedersen & Thomsen, 2003; Wang, 2006) mean family and managerial ownership within insider ownership. Outside ownership include banks, other firms, institutions and governments (Krivogorsky, 2006; Thomsen & Pedersen, 2000). The different identity types, their characteristics and their relation with firm performance are discussed and substantiated with empirical evidence below.

Family ownership

Family ownership involves one or more related individuals which are the controlling shareholder of the firm. Family firms can be both listed as unlisted, and they are strong represented in both forms. In Western Europe, the majority of publicly held firms remain family-controlled (La Porta et al., 2002). Also, smaller unlisted firms are often largely held by families (Thomsen & Pedersen, 2000). Family owners hold often large amounts of equity, or in other words, have a high ownership concentration. Also, retained earnings are often used, which leads to higher shareholder value.

From an agency viewpoint, family ownership provides a solution to the moral hazard problem because the owner has both the power and the incentives to make efficient decisions. Stewardship perspectives argue that family owners act as farsighted stewards of their companies, investing generously in the business to enhance value for all stakeholders (Bubolz, 2001; Miller & Le Breton-Miller, 2005), and creating an enduring and robust enterprise (Arthurs & Busenitz, 2003). Firms with a majority of family owners are characterized as poorly diversified investors by making firm-specific investments in human capital, which make them reluctant to give up control. Large family firm owners are relatively wealthy, and may create a long-term commitment to the survival of the company (Anderson & Reeb, 2003; Thomsen & Pedersen, 2000). Families do not intend to run the risk of losing control by attracting equity form stock markets (Margaritis & Psillaki, 2010). Therefore, they are relatively risk averse, which could lead to lower performance. If ownership concentration is high at family firms, the tendency of not losing control and the large owners' quirkiness may harm minority shareholders. Summarized, strengths of family business are personal ownership and incentives, autonomy and flexibility and identification with the business. Weaknesses include risk aversion, conservatism, succession problems, nepotism and family conflicts (Thomsen & Conyon, 2012).

Managerial ownership

Family firm owners are often associated with having a double role as owners and managers of the firm. Though, also in this situation the separation of ownership and control exists. To decrease the conflicts of interests between owners and managers, managers can be more involved by distributing small amounts of shares to them. A negative issue of managerial ownership is that managers are able to manipulate results to represent better performance than firms actually do. Firms with managerial ownership above a certain level will allow managers to become entrenched and expropriate the wealth of minority shareholders (Fama & Jensen, 1983).

The larger the fraction of a company's shares held by its managers, the more entrenched they are. This leads to two conflicting effects. The first is the alignment effect between the managers and outside shareholders. When the number of shares held by managers increases, the effect on their wealth of a rise in the firm's market value increases. The second effect is the entrenchment effect. The higher the number of shares owned by managers, the more entrenched they become which give them more discretion to pursue

their own goals rather than other shareholders (Gugler et al., 2008; Morck, Shleifer, & Vishny, 1988).

Institutional ownership

An institutional investor is an entity that invests money on behalf of its members. These entities could be mutual or pension funds, money managers, insurance companies, investment firms, private foundations, endowments or other large entities that manage funds on the behalf of others. Institutional ownership is defined as "the sum of a firm's proportion of the total number of outstanding shares held by all institutional investors at year-end" (Lin & Fu, 2017, p. 23). Institutional investors have large amounts of capital available to invest and therefore for firms an easy way to gain capital. Shleifer and Vishny (1986) note that large shareholders may have a greater incentive to monitor managers than members of the board of directors, who may have little or no wealth invested in the firm. In contrast to boards of directors which should handle as "independent" agents, institutional investors have become increasingly willing to use their ownership rights to pressure managers to act in the best interest of the shareholders (Cornett, Marcus, Saunders, & Tehranian, 2007).

Institutional investors are characterized as diversified investors by composing their optimal portfolio and having arm's length relationships with firms. Large institutional investors have the opportunity, resources, and ability to monitor, discipline, and influence managers. This power can result in managers focusing more on corporate performance and less on opportunistic or self-serving behavior. Institutional investors tend to have low risk aversion and a relatively long-time horizon. Their performance is often measured in terms of financial success, shareholder value and liquidity (Thomsen & Pedersen, 2000).

Bank ownership

Bank ownership exists when a banks hold shares of a firm and provide financial services. (Thomsen & Pedersen, 2000). Bank ownership is illegal or less common in Anglo-Saxon countries, but have played an important role in German and surrounding countries. Banks usually have international banking relationships, have privileged access to capital, information and other services which banks can offer. González (2006) found that the reason for banks to acquire firm's stock has two reasons. First, the increase of agency costs in the lending relationship. Second, participation in the expected profits of an undervalued firm.

Corporate ownership

Corporate ownership exists when a legal entity is hold separately from those of its owners. In most of continental Europe, ownership is concentrated and the corporate sector itself is, next to family holdings, is the largest group of shareholders (Franks & Mayer, 1997). Corporate ownership differs from individual or family ownership where owners are often personally liable for their business's debts and losses. The vertical relationships between companies at different stages of the value chain leads to more efficiency, by reducing

transaction costs or "completing" incomplete contracts. Corporate owners are typically large and may therefore have better access to capital from both internal and external sources than e.g. family-owners, although institutions may perhaps have slightly better possibilities (Pedersen & Thomsen, 2003). They are able to build and sustain industrial groups, which may be more inclined to invest for the long term in specialized, efficient, customer-specific assets (Kester, 1992). Corporate ownership may, however, suffer from disadvantages. Kester (1992) argues that corporate ownership can lead loss of flexibility and the risk of deficient mutual monitoring.

Government ownership

Government ownership (also called public ownership or state ownership) is the ownership of a firm by the state or a public body. Reason for a state-owned enterprise (SOE) is to participate in commercial activities on the government's behalf. A firm can be partially or fully owned by the government. A recent example of a partial acquisition is the acquisition of 14% stock of Air France-KLM by the Dutch government. Reason for this was to ensure that Dutch interests will be guaranteed in the Dutch-French firm.

Governments are relatively wealthy, which is beneficial in terms of credit, liquidity, and cost of capital. Profit is not always a condition, governments are more interested in fulfilling nonfinancial political objectives, such as low output prices, employment, and external effects relative to profitability (Shleifer & Vishny, 1986). State ownership tends to be higher in emerging economies and those with poorer protection of property rights (Lopez-de-Silanes, Shleifer, & Porta, 2002). However, developed countries remain interesting in case of market failures when governments intervene if companies are "too big to fail", which means that the consequences for the economy are too disastrous if the company would go bankrupt. An example of a Dutch firm in this situation was the nationalization of the bank ABN AMRO in 2008.

2.3.3.3 Empirical evidence of the impact of ownership structure on firm performance
Ownership concentration

Results from research about the relation between ownership concentration and firm performance are not uniform. Berle and Means (1933) started the debate on the connection between the diffuseness of shareholders and firm performance by finding an inverse correlation between these two variables. Demsetz and Lehn (1985) and Holderness & Sheehan (1988) find no significant cross-sectional relation between accounting performance and ownership concentration after controlling for other variables.

In contrast, Claessens and Djankov (1999) found that ownership concentration is positively correlated with both firm profitability and labor productivity in 706 Czech firms. Gorton and Schmid (2000) found similar results for German firms regarding performance. In addition, these results were more robust on firms which are equity-owned and controlled by bank blockholders. More recent work of Gaur, Bathula and Singh (2015) found also positive effects of high ownership concentration on firm performance. Thomsen and Pedersen

(2000) found that European firms have a relatively high ownership concentration compared with the US. They also found evidence that there is a positive effect between ownership concentration and the performance measures MBV and ROA. This effect, however, tampers off on highly concentrated ownership. Balsmeier and Czarnitzki (2017) also found an non-linear relation.

Looking at the Netherlands only, Donker (2009) analyzed the performance ratios from the Altman Z-scores of Dutch firms and found that large shareholders reduce the probability of financial distress. Frijns et al. (2007) found a significant positive relationship between the holdings of the largest shareholder and firm performance in the Netherlands.

Family ownership

Family firms tend to have higher valuations and profitability than nonfamily firms (Anderson & Reeb, 2003; McConaughy et al., 2001; Villalonga & Amit, 2006). Controlling for size, industry, and managerial ownership, results from the research of McConaughy, Matthews and Fialko (2001) suggest that firms controlled by the founding family have greater value, are operated more efficiently, and carry less debt than other firms. These studies support the view that family ownership can reduce the classical agency problem between managers and shareholders. Maury (2006) agrees with these suggestions and found similar results. In this research, evidence is found that firms with active family control have 16% higher ROAs than diffusely owned firms. Active and passive family control is associated with higher valuations (Tobin's q), but mainly due to economies with high shareholder protection. The researcher suggests that family control reduces agency problems, but may give rise to conflicts between family and minority shareholders.

Barontini and Caprio (2005) and Andres (2008) are more critical against the benefits of family ownership and add that the superior effect of (large) family ownership only holds under certain conditions like if the founders are still active either on executive or supervisory board or in a position as CEO. Family ownership is not necessarily the optimal organizational structure for all companies. Capital-intensive firms are hardly presented by family firms, which, according to Andres (2008), is probably caused by the family's wish to maintain control which could hamper access to external funds. Frijns et al. (2007) found in their dataset of Dutch firms that the number of shares held by insiders (family or managerial ownership), are positively related with firm performance.

Managerial ownership

Gugler et al. (2008) and Maury (2006) found a positive effect of managerial ownership on firm performance, measured by Tobin's Q and ROA respectively. Florackis, Kostakis and Ozkan (2009) found a positive effect on corporate performance when managerial ownership is lower than 15%, and found no strong inference with higher levels of managerial ownership. Donker (2009) found evidence that managerial shareholdings reduce the likelihood of financial distress of Dutch firms. Roosenboom et al. (2005) found that management stock ownership is positively related to IPO firm value in the Netherlands.

Kaserer and Moldenhauer (2007) found that concentrated insider ownership – they include next to managerial ownership also family ownership –have a positive impact on corporate performance. These empirical results suggest also that manager ownership reduces agency problems between managers and shareholders.

Bank ownership

Cable (1985) found positive performance effects among German banks. Gorton and Schmid (2000) found that bank control rights from equity ownership significantly improve firm performance beyond what nonbank blockholders can achieve. Thomson and Pederson (2000) found same results. There is little empirical evidence found for banks on its own, most studies include banks as financial institutions.

Corporate ownership

There is scarcity in relevant research and therefore less empirical evidence found to substantiate the characteristics of corporate owners and its effect on firm performance. Thomsen and Pederson (2000) found that non-financial companies as owners perform significantly less well than institutional owners in terms of MBV. However, sales growth appears to be better at firms with corporate ownership. Frijns et al. (2007) found a positive significant relation between firms that are largely hold by other firms and market to book values.

Institutional ownership

Cornett et al. (2007) found a significant positive relation between operating cashflow returns and both the percent of institutional stock ownership and the number of institutional stockholders. This effect was only found for pressure-sensitive institutional investors (those with an existing or potential relation with the firm), which suggest that institutional investors with potential business relations with the firms in which they invest are compromised as monitors of the firm. Gugler et al. (2014) found also evidence that institutional ownership improves the performance of firms. Results from the study of Chaganti and Damanpour (1991) suggest that the size of stockholdings by institutional investors is significantly related to capital structure and performance. They found that firms which are heavily held by institutional investors have relatively low debt-capital ratios and higher ROEs than lightly held firms. No identifiable effect on total stock return was found in this research. Thomsen and Pedersen (2000) compared the performance of institutional owners with bank, family, corporate and government ownership. They found that institutional owners outperform the other identities (except bank ownership) in MBV and ROA. Sales growth seem to be higher in the other identities.

Government ownership

Research on this topic has extensively been done in mainly Asian countries, where state owned enterprises still playing a significant role. Sun, Tong and Tong (2002) found that partial state ownership has a positive impact on firm performance of Chinese firms. They

also found that the effect reverts at some point when state ownership is high, and suggest that this is caused by too much control and interference in economic operations of the firms. Yu (2013) agrees, and reveal that a higher level of state ownership plays a positive role in enhancing firm performance. The researcher adds that in the Chinese context, investor protection is poor and law enforcement is quite weak. The state, being the large shareholder, can provide support in terms of financing and resources.

Boardman and Vining (1989) found evidence that after controlling for various factors that large industrial mixed enterprises and state-owned enterprises perform substantially worse than similar private corporations. They suggest that partial privatization by governments may not be the best strategy because of the possible conflicts between public and private shareholders. The results from the research of Dewenter and Malatesta (2001) are in line with previous findings.

2.4   External corporate governance mechanisms

The legal system, market for corporate control, external auditing, rating organizations, stakeholder activism and media are the most discussed external corporate governance mechanisms (Aguilera et al., 2015; Cremers & Nair, 2005; Denis & McConnell, 2003).

Firms are embedded in a legal system in which a set of structures and processes is used for interpreting and enforcing the existing law. Also "soft laws" in terms of principles and norms are established between firms, e.g. code of ethics or sustainability reporting. Denis and McConnell (2003) note that the regulatory environment or legal system is an important external governance mechanism. Jensen (1993) acknowledges this, but does not see it as an instrument to deal effectively with agency problems. Moreover, studies that examine evidence from a single country provide little scope for studying the effects of legal systems, as all of the firms in such a sample are subject to the same national legal regime (Denis & McConnell, 2003).

The market for corporate control is based on the logic that markets operate in part to discipline managers and boards. When a firm is performing poorly, the risk that it will be taken over by outside ownership is increasing. These takeovers addresses governance problems (Cremers & Nair, 2005). After a takeover, the combined value of the target and acquiring firm is increasing, because a higher firm performance is expected. The threat of takeovers stimulates the executives to act in the best interests of shareholders, rather than their own interests. Firms may also apply anti-takeover defenses to avoid an unwilling take-over. Dutch listed firms are famous for their ingenious use of them (de Jong et al., 2005; Duffhues & Kabir, 2008). The application of take-over defenses by Dutch firms has created a negative view on corporate governance quality and firm values (Roosenboom & van der Goot, 2005).

External auditing is to express an opinion indicating that reasonable assurance has been obtained that the financial statements are free from material misstatement, whether due to fraud or error, and that they are fairly presented in accordance with the relevant accounting standards (Aguilera et al., 2015). Auditing by external parties creates more

confidence for insiders and outsiders by reducing information asymmetry. Rating organizations, in terms of financial analysts and corporate governance rating agencies, and can cause similar effects. The institutional theory highlights the legitimating role that the ratings may serve when they are taken for granted.

Stakeholder activism reflects the external pressure from stakeholders to influence company policy and practices and improve stakeholder value. Next to shareholders, employees, creditors, customers of communities attempt to influence corporate activities. Audit, remuneration and nomination committees are part of this to represent their interests.

Last, the media is also an important external control mechanism. The media includes several channels, e.g. television, newspapers, social media and the internet. Media increases transparency and reduces information asymmetries between management and stakeholders. The media may influence managers in firms to make decisions and adopt practices that are consistent of widely accepted principles of good governance (Bednar, 2012).

2.5 Hypotheses development

This paragraph discusses the hypotheses of this study. The first hypothesis tests the impact of size of the board on firm performance. The second hypothesis is about the impact of independence of the board on firm performance. The third and fourth hypotheses are about the impact of ownership structure, more specifically ownership concentration and owner identity, on firm performance. The last hypothesis is about the impact of executive compensation on firm performance. The hypotheses are based on the theories and empirical evidence discussed in the literature review. The following hypotheses are defined.

2.5.1 Hypothesis 1a: Board size

The first board characteristic that is hypothesized is board size. The agency theory suggests that the bigger the board, the less managerial control and therefore higher agency costs. Another disadvantage of a large board is the more difficult communication and coordination, which leads to less strong monitoring and weaker insider control. The basic idea is that when boards get to be too big, agency problems increase and the board becomes more symbolic and less a part of the management decision-making process (Thomsen & Conyon, 2012). Nevertheless, a larger board has some advantages. Larger boards benefit from the greater collective information, including knowledge and experience that the board possesses (Guest, 2009). Also, larger boards have fewer personal relations among the board which leads to more diversification. Concerning resource-based theory, the board should be able to link the best resources with the firm. A bigger board should have more connections. However, smaller boards are more united and maybe closer with the firm. Orozco (2018) argues that boards with more than seven members are prone to inefficient operations, lack of commitment, moral hazard problems, and greater control by the CEO.

Looking at studies that investigated the impact of board size on firm performance, a negative impact is found by Florackis (2005), Guest (2009), Cheng (2008), Andres, Azofra and

Lopez (2005), investigating US, UK and OECD firms. Also, other previous studies concerning European firms found negative effects of large boards (Conyon & Peck, 2002; O'Connell & Cramer, 2010).

For the Netherlands, Postma, van Ees, and Sterken (2003) found no relation between the size of the management board and firm performance, but found a negative relation between the size and composition (number of outsiders) of the supervisory board and firm performance. They argue that the role of the management board and its size on average perform effectively. The opposite holds for the size of the supervisory board, meaning that increasing the board is not the best solution to solve agency problems. Thus, the negative aspects of large supervisory boards seem to dominate the positive aspects. Based on the theoretical arguments above and the negative empirical evidence found in previous studies, the following hypothesis is derived.

Hypothesis 1a: Board size has a negative effect on firm performance

2.5.2   Hypothesis 1b: Outside directors

Boards with higher proportion of outside directors create more independence and can monitor management more effectively. Outside directors bring valuable expertise and potentially important connections (Balsmeier & Czarnitzki, 2017). Outside directors are not involved in day-to-day operations and are free from influence of firm management. Moreover, inside directors have been justified on the basis of the better knowledge this kind of director has about the company and the industry where the company operates, so that their experience can improve firm performance. Looking at an agency perspective, agents cannot monitor themselves, nor can other agents with a vested interest be expected to do a good job (Thomsen & Conyon, 2012), so increasing the number of directors will not lead to better monitoring themselves. In general, Dutch firms operate under two-tier board structure that consist of a management board and a supervisory board. The management board is responsible for day-to-day decisions, attaining firm's objectives, the firm's strategy and implementation, risk management and reporting. The supervisory board is responsible for monitoring and advising the executive board, taken all stakeholders into account.

Guest (2009), Jermias and Gani (2014) and Stein and Zhao (2019) found a significant negative relation between the number of outside directors and firm performance, measured by Tobin's Q, ROA and share returns. Stein and Zhao (2019) argue that outside directors may be more likely to be distracted due to their outsider roles. Faleye et al. (2011) also found, despite the better monitoring quality of outside directors, a negative impact on firm performance when the number of outsider directors increases. O'Connell and Cramer (2010) found as one of the least contrary evidence; a positive relation between the number of outside directors and firm performance.

For the Netherlands, Postma, van Ees, and Sterken (2003) found a negative relation between the size and composition (the number of outsiders) of the supervisory board and firm performance.

Based on the theoretical arguments above and the negative effects found in empirical evidence from Guest (2009), Jermias and Gani (2014), Faleye et al. (2011) and Postma, van Ees, and Sterken (2003), the following hypothesis is formulated.

Hypothesis 1b: Outside directors have a negative effect on firm performance

2.5.3   Hypothesis 2a: Ownership concentration

As mentioned in the literature review, concentrated ownership has both advantages and disadvantages. Firms with less concentrated ownership (dispersed ownership) are more likely to have shareholders and managers with conflicting interests which causes agency problems. Also, free-rider problems could exist if firms are owned by many small shareholders. In this situation, these small shareholders are not informed well enough, piggyback on decisions from large shareholders, and refrain investing in monitoring activities which leads to lower performance. In firms with one or a few owners, personal interests are high and risk aversion is low. These owners have shared goals and strategies. Large shareholders will have a stronger incentive to monitor managers and have more (voting) power to enforce their interests and this should increase the inclinations of managers to maximize shareholder value. Also, according to the agency theory, less concentrated ownership leads to more agency conflicts and thus higher agency costs. Continental European countries, including the Netherlands have higher ownership concentration compared with Anglo-Saxon countries. A disadvantage of high concentrated ownership is the lack of diversification. Also, if ownership is too concentrated, it leads to entrenchment and adverse effects on performance.

Empirical evidence shows different results, however most often a significant positive effect or a non-linear positive effect is found in studies concerning Continental European countries (Sánchez-Ballesta & García-Meca, 2007). A positive relation is found by Claessens and Djankov (1999), Gorton and Schmid (2000), and Gaur, Bathula and Singh (2015). Also, Frijns et al. (2007) found a significant positive relationship between the holdings of the largest shareholder and firm performance in the Netherlands. A non-linear relation is found by Thomsen and Pedersen (2000) and Balsmeier and Czarnitzki (2017). Based on the less agency costs of high ownership concentration, less free-rider problems and a better joint strategy of a firm with fewer owners, and the empirical evidence described above, the following hypothesis has been constructed:

Hypothesis 2a: Ownership concentration has a positive effect on firm performance

2.5.4   Hypothesis 2b: Insider ownership

In the research of ownership structure, much attention has been paid on how insiders versus outsiders can affect firm performance. In general, six identity types can be derived; institutional investor ownership, family ownership, managerial ownership, bank ownership, corporate ownership, government ownership (Thomsen & Conyon, 2012). The identity of

the owners has implications for their objectives and the way they exercise their power, which is reflected in a company's strategy with regard to profit goals, dividends, capital structure and growth rates. Firms can be owned by insiders or outsiders (Connelly et al., 2010). Insider ownership is often defined as the percentage of shares of a company hold by its managers (Anderson & Reeb, 2003; Gugler et al., 2008). Kaserer and Moldenhauer (2007), however, argue that in continental European countries also family ownership should be included. This is also applied by other researchers (Frijns et al., 2007; Pedersen & Thomsen, 2003; Wang, 2006).

Family and managerial ownership has several advantages above outside owners. Large family firm owners are relatively wealthy, and may create a long-term commitment to the survival of the company (Anderson & Reeb, 2003; Thomsen & Pedersen, 2000). According to the agency theory, families as large blockholders are positively affecting firm performance. Families have strong incentive to decrease agency costs and increase firm value (Andres, 2008). Furthermore, families have often much knowledge of a firm- or market-specific technology, because of their long-term presence in the firm. This long-term presence also build trust with stakeholders and increases reputation. The many knowledge and experience also lead to better monitoring, which in turn reduces agency problems. Looking at steward theory, since families regard their company as an (emotional) asset that should be passed to the next generation, their investments are based on long-term profit maximization and continuity.

Positive effects of stewardship theory can also be seen with managerial ownership. The stewardship perspective argues that they will act as farsighted stewards of their companies, investing generously in the business to enhance value for all stakeholders (Bubolz, 2001; Miller & Le Breton-Miller, 2005), and creating an enduring and robust enterprise (Arthurs & Busenitz, 2003).

A negative issue of insider ownership is the entrenchment effect. Inside owners get easily entrenched when they have large stakes in a firm, which leads to an inherent conflict between large blockholders and dispersed shareholders. The positive impact of the alignment effect between managers and shareholders and the negative impact of the entrenchment effect might lead to an inverted u-shape relationship with firm performance.

Results from empirical studies are inconclusive. Often a positive relation is found between family ownership and firm performance (Anderson & Reeb, 2003; Andres, 2008; Barontini & Caprio, 2005; Maury, 2006; McConaughy et al., 2001; Thomsen & Pedersen, 2000; Villalonga & Amit, 2006). Looking at the Netherlands only, Frijns et al. (2007) found that the number of shares held by insiders (both family and managerial ownership), are positively related with firm performance.

Empirical evidence on managerial ownership shows also a positive relation with firm performance (Gugler et al., 2008; Kaserer & Moldenhauer, 2007; Maury, 2006). Roosenboom et al. (2005) and Donker (2009) found that managerial ownership is related to higher IPO value and less likelihood of financial distress respectively. Florackis, Kostakis and Ozkan (2009) found a positive effect on corporate performance when managerial ownership

is lower than 15%, and found no strong inference with higher levels of managerial ownership. Empirical evidence shows that the advantages of insider ownership outweigh the disadvantages, and thus suggest that it reduces agency problems. Therefore, the hypothesis is formulated as follows:

Hypothesis 2b: Insider ownership has a positive effect on firm performance

To investigate the possible effects more thoroughly, family and managerial ownership, and also outsider ownership (corporate, bank, institutional and government) will be analyzed separately.

2.5.5   Hypothesis 3: Executive compensation

Executive compensation is a corporate governance mechanism to align the interests of managers with those of shareholders to minimize problems regarding agency theory (Duffhues & Kabir, 2008). Executive compensation encourages executives to focus on long-term value creation and avoid them to act in their own interests, or take risks that are not in line with the strategy of the firm. It is therefore an important corporate governance mechanism to mitigate agency problems.

Looking at empirical evidence, Florackis (2005) and Florackis and Ozkan (2009) found strong evidence that managerial ownership and managerial compensation work as substitute mechanisms in mitigating agency problems and therefore, generating good performance. Result from other studies seem to correspond with these findings. Positive relations between firm performance and compensation have been found in the UK (Ozkan, 2011), US (Conyon, 2014), Australia (Merhebi et al., 2006), China (Conyon & He, 2017; Liu, Peng, & Chen, 2014) and Germany (Elston & Goldberg, 2007). Mehran (1995) found that compensation motivates managers to increase firm value, and found a positive relation. Nelson (2005) and Duffhues and Kabir (2008) found no relation between executive compensation and firm performance.

Despite the findings of the latter two studies, literature suggests mostly a positive association between executive compensation and firm performance. Therefore, the following hypothesis is derived:

Hypothesis 3: Executive compensation has a positive effect on firm performance

To investigate the possible effects more thoroughly, the different aspects (e.g. salary, bonuses, share-based rewards, pension and other benefits) of executive compensation will be analyzed separately.

2.6.6 Hypotheses summary

Figure 2 gives an overview of the hypotheses that will be tested in this study.
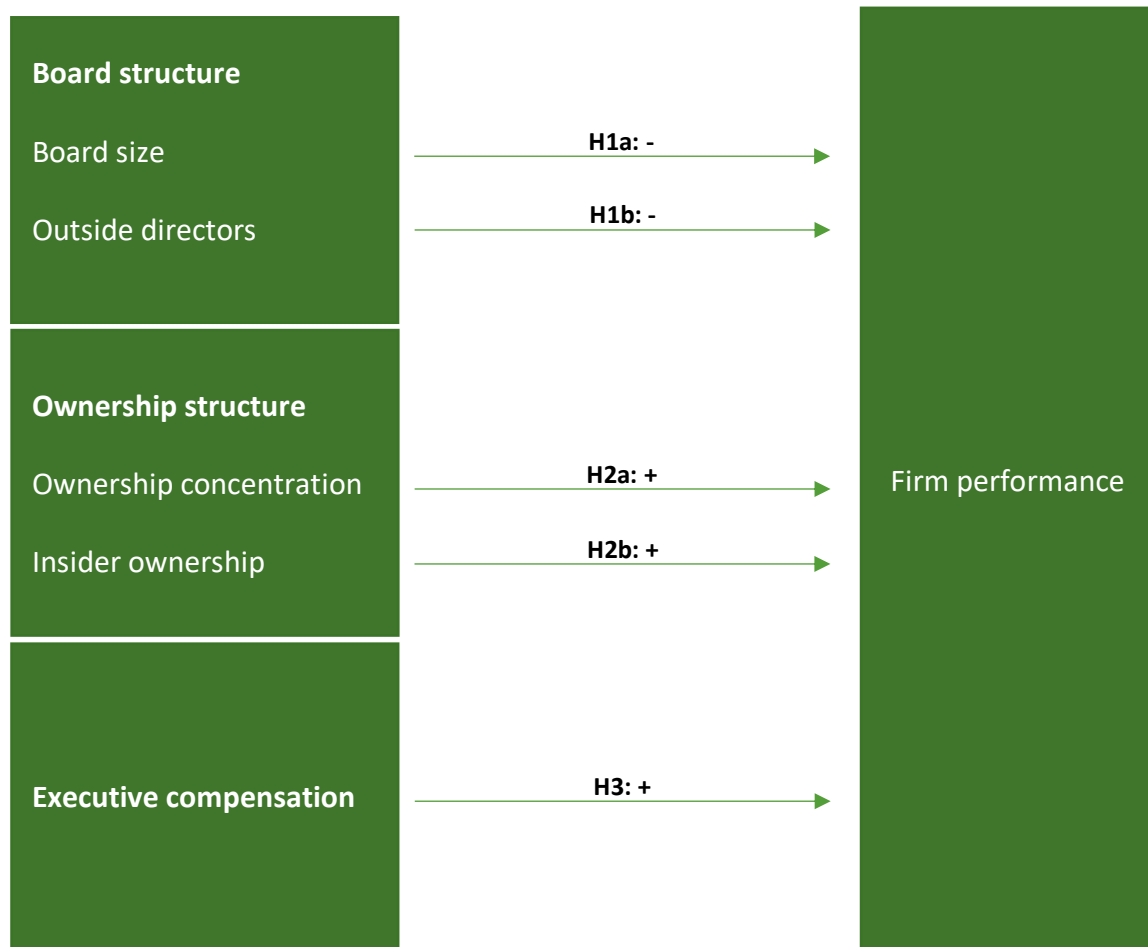
Figure 2: Hypothesized relations of this study

3.   Research methodology

As mentioned earlier, this research investigates if there is any dependence of ownership structure, board structure and executive compensation on firm performance. This chapter discusses models that are used in previous studies and which technique will be used in this research to identify the possible effects. Furthermore, several variables will be conducted which are further described in this chapter. Because multiple variables are observed and analyzed at a time, multivariate analysis is the method used for this study. Other forms are univariate analysis, which is a simpler form involving one variable, and is mostly used for descriptive statistics. Second, bivariate analysis involves two variables, determining if there is any relationship between them.

Looking at previous studies, regression is the most method used to find relationships between the relevant variables for this study (e.g. Brookman & Thistle, 2009; Cornett et al., 2007; Florackis, 2005; Jermias & Gani, 2014; Maury, 2006; Yermack, 2010). Another, less frequent used method is structural equation modelling (Bell & Jones, 2014; Conyon & Peck, 2002; Wiklund, 1998). This a more difficult and extensive method which provides a conceptually appealing way to test theory (Hair, Black, Babin, & Anderson, 2009). To be consistent with many previous studies corresponding to the topic of this study, regression analysis seems the most appropriate method for this study and will be discussed further.

3.1   Regression analysis

Regression is the most used method to measure dependency. Almost all studies considered in the literature review used one more different regression analysis. A regression analysis uses independent variables X (predictors) to measure relationships with the dependent variable Y. Regression lines are to predict the value of *y* for a given value of *x*. There are different types of regression. Probit and logistic regression models are types of regression where the dependent variable is dichotomous, which means that it can take only two non-metric variables. The difference between them is the different link function. In this research, four different dependent metric variables are used for predicting y; ROA, ROE, Tobin's Q and stock return. Since these are metric variables, probit and logistic regression are unsuitable in this study. Linear regression is used when there is a metric dependent variable that is an interval or ratio variable, and therefore applicable for this study. Linear regression is useful if there is one predictor. This research will use several independent variables. Multiple regression is used, because there is more than one predictor explaining Y. It is assumed that the independent variables are not highly correlated, and that there is no multicollinearity. To check if this applies, a correlation analysis will be performed. A correlation analysis is a bivariate analysis and measures the direction and strength of the linear relationship between two quantitative variables and is often written as *r* (Moore, McCabe, & Craig, 2014). *r* is always a number between -1 and 1. Values near 0 indicate very weak regression and -1 and 1 mean very strong negative and positive regression respectively.

3.2   Prior studies

In similar previous studies, researchers used one or more statistical regression methods to find relations between their research variables. For robustness, some studies included a second method. Most of them used the method of least-squares, also known as ordinary least squares (OLS). Others used fixed or random effects methods, generalized least squares or two-stage least squares regression. To draw a regression line, OLS chooses the parameters of a linear function of a set of explanatory variables by the procedure of minimizing the residuals (e.g., minimizing the differences between predicted and actual values of the dependent variable) (Hair et al., 2009). OLS is used by most of similar studies which investigate any relation between ownership structure (e.g. Agrawal & Knoeber, 1996; Demsetz & Villalonga, 2001; Douma et al., 2006; Krivogorsky, 2006; Roosenboom & van der Goot, 2005), board structure (Jermias & Gani, 2014; Joecks et al., 2013; O'Connell & Cramer, 2010; Post & Byron, 2013; Postma et al., 2003; Smith et al., 2006) and executive compensation (Conyon & He, 2017; Merhebi et al., 2006; Yermack, 2010). Advantages of OLS are its relative simplicity and ease of use regarding implementation and reading. A critical point for OLS is the chance of endogeneity which happens if the regressors are correlated with the error term. Four different issues may potentially introduce endogeneity in OLS regression models; errors-in-variables (i.e. measurement error), autoregression, omitted variables, and simultaneous causality (Semadeni, Withers, & Certo, 2014). An extension of the OLS method the two-stage least squares (2SLS) model, and is used when the dependent variable's error terms are correlated with independent variables. This model is also used in some studies (Demsetz & Villalonga, 2001; Marinova et al., 2016; McConaughy et al., 2001; Wintoki, Linck, & Netter, 2012). 2SLS includes instrumental variables which replace the original endogenous variables in the second stage regression model. Some researchers used both OLS and 2SLS for more robustness (Wintoki et al., 2012). Three stage least squares (3SLS) was performed by Frijns (2007). This model is more efficient than 2SLS if it is well specified. Andres (2008) used in his research into ownership concentration and firm performance generalized least squares (GLS) next to OLS for more robustness and found similar results between the models. Generalized least squares is like OLS a model for estimating the unknown parameter in linear regressions. However, this model is used if there is a certain degree of correlation between the residuals in a regression model.

Fixed effects and random effects are other regression techniques. In the fixed effects model, the parameters are fixed or non-random, which are specific values specified by a researcher (Hair et al., 2009). Fixed effects requires, by nature, longitudinal variation in data (Andres, 2008). Examples of studies used fixed effects, sometimes next to OLS, are those from Barontini et al. (2005), Maury (2006) and Shehata (2017). In contrast to the fixed-effects method, the random effects method uses random variables as parameters. This method is used in some studies from Andres (2008), Gugler et al. (2014) and King and Santor (2008). The random-effects models provides everything that fixed-effects promises, and it also supports unbalanced data (Bell & Jones, 2014). Another method used to a lesser extent is the (multivariate) logistic regression (Nelson, 2005). In this method, a logistic function is

used to model a binary dependent variable, which is a variable with two possible values (e.g. pass/fail, yes/no, true/false).

3.3 Method for this study

Multiple linear regression with ordinary least squares is the most suitable method to perform this research. The reason why OLS is used is because it is fast and easy to compute, and its relative simplicity and ease of use regarding implementation and reading. It is consistent with previous studies for comparability with them. Other studies have showed that this is an appropriate method to measure the impact on corporate performance (Conyon, 2014; Florackis, 2005; Guest, 2009). Furthermore, the type and number of variables used in this research are suitable for this method. To check if the assumptions like endogeneity, multicollinearity and homoscedasticity are fulfilled, these will be continuously tested using IBM SPSS.

3.4 Research model

In order to test the hypotheses, OLS is used to determine the possible impact of internal corporate governance mechanisms on firm performance. The models from the work of Florackis (2005) and Guest (2009) are followed.

In order to test all hypotheses, the following regression model is conducted:

$$FP_{i,t+1} = \alpha + \beta_1(Board\_Structure_{i,t}) + \beta_2(Own\_Structure_{i,t}) + \beta_3(Compensation_{i,t}) + \beta_4(Control_{i,t}) + \varepsilon_{i,t}$$

Where:

$FP_{i,t}$	= Firm performance for firm i in year t;
α	= Constant
$Board\_Structure_{i,t}$	= Board structure, of firm i in year t;
$Own\_Structure_{i,t}$	= Ownership structure of firm i in year t;
$Compensation_{i,t}$	= Executive compensation of firm i in year t;
$Control_{i,t}$	= Control variables; size, age, leverage, industry of firm i in year t;
$\varepsilon_{i,t}$	= Error term of firm i in year t

A bivariate correlation matrix is conducted first in order to analyze if multicollinearity exists in the model. The variance inflation factor (VIF) is also used to measure and to check this. In order to check if the data is homoscedastic, scatter plots are drawn and analyzed if the residuals are equally distributed around the regression line. To face potential problems with endogeneity, one-year lagged variables are included in the model. Lagged variables are also applied to face for endogeneity problems and to add more robustness in previous studies (e.g. Balsmeier & Czarnitzki, 2017; Conyon, 2014; Frijns et al., 2007; Gugler et al., 2008).

3.5 Variables

This section describes the measurement of the dependent, independent and control variables. An overview of the variables, it's definitions and abbreviations are given in table 3.

3.5.1 Dependent variables

In this research, the dependent variable is firm performance. In most studies, researchers use one or more ratios to determine firm performance (Andres, 2008; Bhagat & Bolton, 2008; Conyon & He, 2017; Cornett et al., 2007; Florackis, 2005; Guest, 2009). Ratios that are often used are accounting based values, such as return on assets (ROA), return on equity (ROE) and growth. ROA and ROE provides an insight in how a company is able to efficiently generate profit from its assets or equity respectively. Growth is often measured as sales growth (Claessens et al., 2002). Other measures for growth are employment growth (Delmar, 1996), total assets (Krivogorsky, 2006) or in equity (Thomsen & Pedersen, 2000). Another way to measure firm performance is to use market-based or hybrid values such as Tobin's Q, market to book value and stock return (RET). These measures are suitable ratios since they include the market situations. Market-based measures have a forward-looking approach, using market prices that reflects the confidence of shareholders. Accounting-based measures use historical accounting data to measure performance. Another advantage of market-based measures is the less susceptibility for manipulation by management. To prevent for the limitations of one specific ratio and to be more robust, multiple ratios are used.

3.5.1.1 Accounting-based measures

Return on assets

The return on assets (ROA) is a measure of financial performance that provides how much profit a company is able to generate from its assets. The ROA is calculated by dividing the firm's net income after tax by the average total assets (Leach & Melicher, 2017). Net income is calculated as firm's sales minus cost of goods sold, operating expenses, depreciation, interest, taxes and other expenses for one year. Most of the empirical studies found contain this method of calculating ROA, which is used as a variable to measure performance (Anderson & Reeb, 2003; Carter et al., 2010; Conyon & He, 2017; Cornett et al., 2007; Dewenter & Malatesta, 2001; Francoeur et al., 2008; Krivogorsky, 2006; Maury, 2006; Pedersen & Thomsen, 2003; Shehata et al., 2017). There are other ways to calculate ROA. Barber and Lyon (1996) and Bhagat and Bolton (2008) calculated ROA as operating income before depreciation divided by total assets to mitigate potential earnings manipulation associated with an accrual-based measure of operating income. Operating income is calculated as firm's net income plus interest and taxes, and is also called earnings before interest and taxes (EBIT) when a firm has no other earnings from non-operating activities (Leach & Melicher, 2017). Poutziouris (2015) even went one step further and used earnings before interest, taxes, depreciation and amortization (EBITDA) as numerator. This study uses operating income divided by total assists to calculate ROA.

Return on Equity

The return on equity (ROE) is a measure of financial performance that provides how efficiently firms use investments to generate earnings growth, and is often used in empirical studies to determine firm performance (Anderson & Reeb, 2003; Andres, 2008; Krivogorsky, 2006; Yu, 2013). ROE measures the rate that an entrepreneur and other equity investors have earned on their investment (Leach & Melicher, 2017). The ROE is calculated by the net income, divided by the average shareholders' equity. Another less common method is using operating income as numerator. Net income is a better measure since this comes closest to the paid-out value to shareholders. Therefore, ROE using net income is used in this study.

3.5.1.2 Market-based/hybrid measures

Tobin's Q is a well-known market-based measure for firm performance. Tobin's Q reflects the market's expectations of future earnings and is thus a good proxy for a firm's competitive advantage (Shehata et al., 2017). It is calculated by the market value of a company, divided by its replacement value. The market value is calculated by the sum of market equity (stock price times number of shares) plus the market value of debt. Replacement value is derived from the company's book value of total assets.

In previous research, Tobin's Q is often calculated as the book value of assets minus the book value of equity plus the market value of equity, divided by the book value of total assets (Conyon & Peck, 2002; Faleye et al., 2011). Since Tobin's Q also includes book-valued components, it is also known as a hybrid measure.

Stock return (RET) is also a suitable market-based measure. The RET is calculated as the stock price difference between the beginning and the end of the year, plus dividends, all divided by the stock price at the beginning of the year (Duffhues & Kabir, 2008).

Another market-based/hybrid measure is the market-to-book value (MBV). This is a widely accepted ratio that is measured by the market value of equity divided by the total book value of equity (e.g. Kaserer & Moldenhauer, 2007; Krivogorsky, 2006; Postma et al., 2003).

3.5.2   Independent variables

The independent variables (or explanatory variables) are ownership concentration, the different ownership identity types, board size, outside directors on the board, and executive compensation. The different methods of measuring these variables are discussed below.

Ownership concentration

Ownership concentration is most often measured as the amount of stock in percentage, owned by the largest owner (Claessens et al., 2002; Maury, 2006; Thomsen & Pedersen, 2000). Another method that is applicable is the Herfindahl method or the percentage of shares held by the five largest shareholders (Craswell, Taylor, & Saywell, 1997; Demsetz & Lehn, 1985). Generally, there is a high level of ownership concentration in European

companies. Therefore, the share and identity of the largest owners is a fairly good measure of ownership structure (Faccio & Lang, 2002; Thomsen & Pedersen, 2000).

Insider ownership

In other studies, there are different ways used to measure or classify ownership identity. Thomsen and Pederson (2000) and Maury (2006) used a categorical dummy variables of the identity type of the largest shareholder. An advantage is that this is easy to apply and Thomsen and Pederson (2000) state that it is "a fairly good measure of ownership structure in European companies because of a generally high level of ownership concentration" (p. 696). A disadvantage is that the second largest or other smaller shareholders will not be included, despite that they have significant power to influence decisions in the firm.

Demsetz and Villalonga (2001), Villalonga and Amit (2006) and Krivogorsky (2006) used ownership ratios as variables. They used the aggregate percentage of shares held by the different identity types. This method is followed.

Insider ownership (InsiderOwn) is measured as the aggregate percentage of shares held by family and managers (Kaserer & Moldenhauer, 2007). In the robustness tests, the different ownership identity are analyzed separately.

Board size

Board size is measured as the number of board members of the management board and supervisory board. This two-tier structure is – as described in the literature review – common in the Netherlands. The measure is in line with the research from Postma et al. (2003) and Andres et al. (2005). To analyze more thoroughly, the size of the executive board and the size of the supervisory board are also used as separate variables.

Outside directors

The number of outside directors is calculated by the number of supervisory board members, divided by the total number of board members. This measure is in line with the research from Postma et al. (2003).

Executive compensation

Executive compensation is measured as the natural logarithm of the total sum of compensation paid to executives. This is in line with the research from Brick et al. (2006). The executive or management board may exist of more than one member, and therefore the total compensation is divided by the number of executive board members.

To analyze executive compensation more thoroughly, an additional analysis of the different compensation components is made in the robustness tests. The different components are; base salary, annual bonus, other emoluments such as lease car costs or study costs, share-based rewards and pension benefits.

3.5.3 Control variables

Although this study focusses on the effects of internal corporate governance mechanisms on firm performance, other variables might also have an effect. The effect of governance mechanisms should be controlled for product market competition (industry effects) and capital structure (debt pressure). Firm size is also used as a control variable. Firm size is not a corporate governance variable, but it nevertheless is related with performance in many other studies. It is necessary to control for these effects, and therefore the control variables have been conducted in the research model.

Firm size

Size is most often measured as the log of total assets. "Size of a firm can have significant influence on firm performance and a proxy for firm size is used in almost all studies explaining firm performance" (Douma et al., 2006, p. 649). Claessens (2000) argues that the control factor size should be added, because smaller firms have better growth prospects and large firms may perform less well through their more extensive diversifiction. Fama and French (1995) found that, on average, smaller firms have lower ROE than large firms. To reduce skewness, the natural logarithm transformation is often used. Size can also be measured as the natural logarithm of number of employees (Boardman & Vining, 1989) or total annual sales (Margaritis & Psillaki, 2010).

Firm age

In the literature review, Le Breton-Miller et al. (Le Breton-Miller et al., 2011) state that agency or stewardship behavior in firms depends on different circumstances including the amount of generations a firm has passed through. Several other studies have included firm age as control variable (Andres, 2008; Shleifer & Vishny, 1997; Villalonga & Amit, 2006). Firm age is measured as the years a firm has been active since incorporation.

Capital structure (leverage)

To control for the effect of debt pressure on performance, the variable leverage is added. It is proved that leverage has an impact on firm performance in either positive or negative way (Bhagat & Bolton, 2008; Margaritis & Psillaki, 2010). Leverage is often measured by dividing the sum of the long-term debt by the total assets of the firm (Agrawal & Knoeber, 1996; Maury, 2006). Leverage can also be measured as the sum of long-term debt divided by total assets (Anderson & Reeb, 2003), which takes the steady and long-term capital structure more into account.

Industry effects

Industry effects may have an influence on firm performance because the type of industry can differ in size, growth, level of rivalry, R&D intensity and entry barriers (Elango & Sambharya, 2004; Grabowski & Mueller, 1978; Short, 1994). Dummy variables are used to mark in which industry type the firm is classified. Further information about industry classification will be discussed in the next chapter.

Year effects

To control for differences between the years in the sample, a dummy variable is computed to mark which year the data is from.

Table 3: List of variables

Dependent variables		
Firm performance		
Return on assets	ROA	(Operating income) / (Total assets)
Return on equity	ROE	(Net income) / (Shareholders' equity)
Tobin's Q	Tobin's Q	(Book value of assets - book value of equity + market value of equity) / (Book value of total assets)
Stock return	RET	(Stock price difference + dividends) / (Stock price at the beginning of the year)
Market-to-book value	MBV	(Stock price * number of shares outstanding) / (Book value of equity)

Independent variables		
Board structure		
Executive board size	ExeBoard size	Number of executive board members
Supervisory board size	SupBoard size	Number of supervisory board members
Board Size	BoardSize	Total number of executive and supervisory board members
Outside directors	OutDir	(Number of directors of the supervisory board) / (Total number of management and supervisory board members).
Ownership structure		
Ownership concentration	OwnCon	Percentage of shares held by the largest owner
Insider ownership	InsiderOwn	(Shares held by family members and managers) / (total number of shares)
Compensation		
Executive compensation	LnTotComp	Ln(total executive compensation) Total executive compensation includes: base salary, annual bonus, share-based rewards and pension benefits.
Executive compensation per board member	LnTotComp1	Ln(total executive compensation/number of executive board members)

Control variables		
Firm size	LnAssets	Ln(total assets)
Firm age	LnAge	Ln(years active since incorporation)
Leverage	Leverage	(Total debt) / (total capital)
Industry effects	IND	NACE industry classification, dummy variable
Year effects	YEAR	Year, dummy variable

Notes: This table presents the definitions and abbreviations of the variables used in this study.

4.   Data

This chapter discusses the data sample that has been used for this study, and the resources of data used in this study to perform the analysis.

4.1   Sample size and data collection

The sample of this study is drawn from listed companies from the Netherlands. This includes almost all the firms listed on Euronext Amsterdam. Three important stock market indexes in the Netherlands are the Amsterdam Exchange index (AEX), the Amsterdam Midcap index (AMX) and the Amsterdam Small Cap index (AScX). The AEX index represents the 25 largest firms, the AMX the rank 26-50, and the AScX the rank 51-75 in market capitalization. In addition, there are some firms that do not participate in these indexes. These are also included in the sample.

Since ownership data, board structure data and remuneration data (with the exception of variable compensation) are quite stable over time, it is not necessary to analyze this data over several consecutive years (Postma et al., 2003; Roosenboom & van der Goot, 2005; Yermack, 2010). Therefore, a bigger time-span of five years is taken, meaning the period 2012 and 2017. The dependent variables are lagged one-year and therefore from 2013 and 2018. Only firms that were listed in at least one of these periods are included in the sample. Appendix A shows all included firms in the sample and the availability of data by year.

Some firms listed at the Euronext Amsterdam are excluded from the sample. First, some firms have double listings, e.g. Heineken (Holding), Altice Europe (A and B shares) and Philips (Royal Philips and Philips Buy Back). Second, some firms are listed on the Euronext Amsterdam, however have no operations or headquarters in the Netherlands, e.g. Boussard & Gavaudan or Pershing. Those firms are excluded from the sample. Some firms with foreign country ISIN codes, e.g. Royal Dutch Shell, are not excluded because of their Dutch origin and operations in the Netherlands. Third, financial and insurance firms are excluded from the dataset because they are difficult to analyze in terms of performance and valuation and therefore may bias results (Claessens et al., 2002). Fourth, firms with incomplete, insufficient or unusable data are also excluded from the sample. Incomplete data is often caused by the fact that the firm just went public at that time like Adyen N.V. or Alfen N.V. or went off the stock market like Nutreco N.V. or Ten Cate N.V. Table 4 describes how the sample size is established after the exclusions. For the year 2012, the number of firms are 73 and for the year 2017 the number of firms are 87, which leads in total to 160 firm-year observations in the final sample.

The data that is necessary for this study is gathered from firms' annual reports and Bureau van Dijk's database Orbis. The Orbis database contains data of 275 million firms worldwide, including general information like location, year of incorporation, number of employees and type of industry. It also contains financial and stock data. Board data, ownership data and remuneration data are collected via annual reports. An advantage for this study and similar studies is that the corporate governance codes prescribe that firms

should be transparent and submit information about their board structure, ownership structure and executive compensation in their annual reports. Annual reports are mostly available via corporate websites, and otherwise via the website of the Dutch "Autoriteit Financiële Markten", or "AFM". Financial data, dates of incorporation and industry types are gathered via the Orbis database. This data is checked and where necessary supplemented with data from the annual reports. Insufficient, incomplete or unusable data is excluded from the dataset. Extreme values of the financial performance ratios are winsorized below the 2.5 and above the 97.5 percentiles to reduce the effects of these outliers. Replacing the outliers instead of removing will not decrease the sample size and losing information. This method is often used in many previous studies (Abdallah & Ismail, 2017; Barontini & Caprio, 2005; Douma et al., 2006; Guest, 2009).

Reason for exclusion		2012	2017
All firms listed on the Euronext Amsterdam		136	140
Exclusion of multiple listed firms	-/-	10	12
Exclusion of firms that are not headquartered and have no operations in the Netherlands, or have no Dutch origin.	-/-	24	24
Exclusion of financial or insurance firms	-/-	11	11
Exclusion of firms with missing, insufficient or unusable data	-/-	18	6
Sample size for the year		73	87

Table 4: Determining the sample size

4.2 Industry classification

To control for industry effects, industry dummies are created. Orbis classifies firms based on the NACE Rev. 2 or US SIC codes. Choosing between NACE Rev. 2 or US SIC codes does not lead to different industry classifications, however the NACE Rev. 2 is preferred because it is maintained in Europe. The NACE Rev. 2 exist of 21 level 1 codes ranging from A till U. Using 21 categories may be problematic with a sample size of 160. Therefore, industries are recoded into 5 categories; "Agriculture, retail and transport (IND1)", "Manufacturing (IND2)", "Construction and mining (IND3)" and "Real estate (IND4)" and "Service companies (IND5)". An overview of the number of firms per year per industry type, before and after reclassification is given in table 5. For a more detailed view about all firms included in the sample and their industry classification, see appendix A.

Table 5: Overview of the number of firms per year per industry type, before and after reclassification

NACE Rev 2. Classification	2012	2017	Reclassification	2012	2017
A - Agriculture, forestry and fishing		1	**Agriculture, retail and transport (IND1)**	9	10
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	6	7			
H - Transportation and storage	3	2			
C - Manufacturing	28	34	**Manufacturing (IND2)**	28	34
B - Mining and quarrying	3	3	**Construction and mining (IND3)**	9	8
F - Construction	6	5			
L - Real estate activities	6	6	**Real estate (IND4)**	6	6
J - Information and communication	12	16	**Other services (IND5)**	21	29
M - Professional, scientific and technical activities	4	5			
N - Administrative and support service activities	3	3			
Q - Human health and social work activities		1			
R - Arts, entertainment and recreation	1	3			
S - Other service activities	1	1			
Total number of firms	**73**	**87**		**73**	**87**

5.   Results

This chapter presents the results of this study. In the first section, the descriptive statistics of the variables used in this study are described and compared. Secondly, a correlation matrix or bivariate analysis is performed to test if there exist multicollinearity between variables. The third section of this chapter contains the results of the different regressions that have been performed to test the hypotheses. The last section contains the results and discussion of different robustness tests.

5.1   Descriptive statistics

The descriptive statistics of the dependent, independent and control variables that are used in the regressions of this study are displayed in table 6. The table includes both years that are investigated, namely 2012 and 2017. There is no remarkable difference between the values of both years, except that the performance values of 2017 were a little bit lower than the values of 2012. The dependent variables ROA, ROE, Tobin's Q, MBV value, and RET have 160, 157, 153, 153, 152 observations, respectively. The number of observations varies between them, which is caused by missing or insufficient data. The data of the dependent variables is, as described earlier, winsorized below the 2.5 and above the 97.5 percentiles. First, the mean and median will be compared with previous studies. An attempt has been made to compare with similar studies about the Netherlands, however there is a shortage of recent studies. Other time periods have undergone different economic situations which leads to different outcomes. Therefore, some variables are compared with similar studies concerning continental European countries.

The first financial performance proxy is the ROA with a mean (median) of 0.020 (0.049). Postma et al. (2003) found a mean (median) ROA of 0.097 (0.0921) which is a little bit higher than the mean ROA in this study. Van Beusichem, de Jong, DeJong and Mertens (2016) found a mean (median) ROA of 0.068 (0.086) in their study concerning the Netherlands.

Looking at ROE, a mean (median) of 0.002 (0.090) is found in this study. Krivogorsky (2006) found a mean (median) of 0.07 (0.02). Joecks (2013) found a mean of 0.094, and Renders et al. (2010) found means of -0.08 and 0.13.

For Tobin's Q a mean and median of respectively 1.125 and 0.848 is found. This is lower than the descriptives of the study from Marinova et al. (2016) who found a mean value of 2.299. Van Beusichem et al. (2016) reported a higher values with a mean of 1.757 and median of 1.356. Douma et al. (2006) found a mean of 1.30 and a median of 0.80. In this study, the market-to-book value has a mean value of 2.713 and a median of 1.783. Krivogorsky (2006) found higher values; a mean of 3.66 and a median of 2.06. Frijns et al. (2007) found about the same mean of 2.96. The mean values of Tobin's Q and MBV are above one, which indicates that on average, the Dutch firms in the sample have a higher market value than book value. Some firms have a negative market-to-book value (the minimum is -0.153), which is caused by their negative equity on their balance.

RET has a negative mean (median) of 0.028 (0.047). This is lower than the study of Lückerath-Rovers (2013) who found a mean (median) of 0.264 (0.209). The lower results of

RET in this study are caused by the year 2018. Looking at the mean stock return of this study for the year 2013, a mean of 0.18 (not displayed in the table) is found which is more in line with the study of Lückerath-Rovers (2013).

Table 6: Descriptive statistics

	Mean	Median	Std.dev.	Min	Max	P25	P75	N
Dependent variables								
ROA	0.020	0.049	0.131	-0.480	0.208	0.001	0.088	160
ROE	0.002	0.090	0.457	-2.302	0.673	0.001	0.145	157
Tobin's Q	1.125	0.848	1.155	0.117	6.092	0.469	1.251	153
MBV	2.713	1.783	3.313	-0.153	18.303	0.976	2.873	153
RET	-0.028	-0.047	0.329	-0.710	0.696	-0.280	0.193	152
Independent variables								
ExeBoard size	2.381	2.000	1.075	1.000	6.000	2.000	3.000	160
SupBoard size	5.144	5.000	2.130	1.000	12.000	4.000	6.000	160
BoardSize	7.525	7.000	2.654	2.000	16.000	6.000	9.000	160
OutDir	0.676	0.667	0.102	0.429	0.909	0.600	0.750	160
OwnCon	0.258	0.164	0.220	0.030	0.975	0.101	0.345	160
InsiderOwn	0.173	0.050	0.259	0.000	0.975	0.000	0.225	160
TotComp (mln €)	3.191	1.751	3.748	0.010	20.352	0.776	4.241	158
TotComp1 (mln €)	1.264	0.755	1.407	0.010	7.330	0.421	1.492	158
Control variables								
TotAssets (mln €)	8195.531	814.217	35019.636	1.001	339445.630	102.777	3794.175	160
Age	61.79	38.50	59.752	1	334	19	93.75	160
Leverage	0.566	0.547	0.185	0.062	1.094	0.453	0.668	160

Notes: This table represents the descriptive statistics of the variables used in this study. The sample consist 160 firm-year observations from 2012 and 2017. Dependent variables are lagged one year and winsorized below the 2.5 and above the 97.5 percentiles. Financial firms are excluded. P25 represents the 25th percentile and P75 the 75th percentile of the variables. N is the number of observations. Variable definitions are given in table 3.

Looking at the independent variables, board size is the first variable. In the Netherlands, a two-tier board is common, consisting of an executive board (Raad van Bestuur) and a supervisory board (Raad van Commissarissen). The mean size of the executive board of the Dutch sample used in this study is 2.381. The mean size of the supervisory board is 5.144. Postma (2003) found in his Dutch sample a mean of 2.95 for the executive board and 4.95 for the supervisory board, which data was just before the application of the Dutch corporate governance code. This might explain the difference that the mean size of the executive board became smaller and the size of the supervisory board became bigger, resulting in a more independent board. The variable BoardSize with a mean (median) of 7.525 (7.000) represents the number of members on the executive board and

supervisory board together. This value ranges from 2 till 16 members. Marinova et al. (2016) found in their study a comparable mean of 7.817. The last board variable is the ratio of outside directors. This sample used in this study has a mean of 0.676. Marinova et al. (2016) found a little lower mean of 0.551.

The next variables are the ownership structure variables. In this study, the mean ownership concentration is 0.258, and the median 0.164. Kabir et al. (2001) found a similar mean (median) of 0.269 (0.164) from their data of 1996. Frijns et al. (2007) found a mean of 0.239 of their 2005 data from the Netherlands. Insider ownership has a mean of 0.173 and a median of 0.050. Gugler (2008) found a much higher mean of 0.43 and median of 0.42 for European Civil Law Countries. Fraile and Fradejas (2014) found a mean of 0.111 and a median of 0.001 in their study concerning European firms.

Total executive compensation has a mean of 3.191 million Euros. The standard deviation is 3.748 meaning that there are big differences between executive compensation within firms. Alumexx N.V. and MKB Nedsense N.V. pay the lowest compensation to their executive directors, namely 10.000 and 15.000 Euros respectively. SBM Offshore N.V. and Koninklijke Ahold Delhaize N.V. pay the most executive compensation, namely 15.839 and 20.352 million Euros respectively. Duffhues and Kabir (2008) found a mean of total compensation of 6.492 million Euros. Reason for this large difference is the difference in time and that their research includes the component stock option rewards. Looking only at the components of cash compensation in their research, a mean of 1.741 million Euros is found. TotComp1 is a second executive compensation variable which is computed by the total executive compensation, divided by the number of executive members on the board. This represents the value of executive compensation per board member and has a mean of 1.264 million Euros. For all independent variables, there are no interesting differences observed between the time periods 2012 and 2017.

Looking at the control variables, size is measures as assets in millions of Euros. The mean value is 8195.531 million Euros and the median is 814.217, meaning that the curve is skewed to the right. The standard deviation of the total assets is very high, meaning that there are big differences between the total assets of firms. The smallest firm has a total of assets of 1 million Euros while the largest has a total value of assets of 35 billion Euros. To reduce skewness, the natural logarithm is used in the regression. The mean of the natural logarithm is 9.011, which is lower than the mean of 12.148 from the research of Marinova (2016). The next control variable is age with a mean of 61.79 years and median of 38.50. The oldest firm is 334 years old, representing Koninklijke Brill N.V. This looks like an outlier, though Koninklijke Wessanen N.V. and Koninklijke Ten Cate N.V. are 252 and 247 years old. Also here, the data is transformed to natural logarithms to be better distributed. The data-transformations of compensation, assets and age to the natural logarithm of these variables are displayed in appendix B. Leverage is the last control variable with a mean of 0.566 and almost equal median of 0.547. The minimum value is 0.062 which represents Avantium N.V., and the maximum is 1.094 which represents PostNL N.V. Firms with a leverage higher than 1

have a negative book value of equity. Duffhues and Kabir (2008) found a little higher mean value of leverage of 0.616 and median of 0.637 for the period 1998-2001.

5.2   Correlation matrix

The Pearson's correlation matrix is displayed in table 7. This table presents the bivariate analysis between the variables used in this study. The dependent accounting-based performance variables show high correlations between each other at the 1% level. ROA and ROE are highly correlated ($r = 0.790^{**}$). Looking at the market-based/hybrid performance variables, there is a high and significant correlation between Tobin's Q and MBV ($r = 0.694^{**}$). RET correlates positively with all other dependent variables at the 1% level, except the MBV.

The first independent variable is board size, which can be split up into executive board size (ExeBoard) and supervisory board size (SupBoard). Executive board size has no relation with the performance variables. Supervisory board size has a significant positive relation on ROA ($r = 0.192^{*}$). Total board size (BoardSize) is positively correlated with all the dependent variables except for Tobin's Q, and significant at the 1% level for ROA ($r = 0.204^{**}$). The variable outside directors (OutDir) has no significant relations with all performance indicators. Furthermore, ownership concentration (OwnCon) and insider ownership (InsiderOwn) also have no significant relations with the performance variables. The natural logarithm of total executive compensation (LnTotComp) shows significant relations at the 1% level with the accounting-based performance variables (ROA, $r = 0.292^{**}$; ROE, $r = 0.221^{**}$).

Some independent variables are correlated with each other. The variable OutDir is positively and significantly at the 1% level correlated with board size ($r = 0.214^{**}$), which is logical since the more outside directors, the larger the board is. Board size also shows a negative relation at the 1% significance level with OwnCon ($r = -0.315^{**}$) and InsiderOwn ($r = -0.344^{**}$), and a positive relation with LnTotComp ($r = 0.773^{**}$). The latter correlation makes sense because the larger the board, the more members are paid. Therefore, LnTotComp1 measures the compensation per executive, though the significant relation remains but is less strong. LnTotComp is negatively related with OwnCon ($r = -0.294^{**}$) at the 1% significance level.

Regarding the control variables, the first variable is the natural logarithm of total assets (LnAssets). This variable shows a positive and significant relations with accounting-based performance variables (ROA, $r = 0.378^{**}$; ROE, $r = 0.288^{**}$). This suggests that larger firms perform better than smaller firms. Remarkable is that LnAssets shows a negative relation at the 1% level with Tobin's Q ($r = -0.216^{**}$). LnTotComp1 shows also a highly positive and significant correlation with LnAssets ($r = 0.791^{**}$), suggesting that larger firms pay more compensation to executives than smaller firms. OwnCon ($r = -0.230^{**}$) show a negative relation with LnAssets, suggesting that larger firms have more owners. The natural logarithm of the age of the firm (LnAge) is the second control variable and shows also positive relations with accounting-based performance variables (ROA, $r = 0.266^{**}$; ROE, $r = 0.242^{**}$;) and with

RET (r = 0.167*). This suggests that older firms perform better than younger firms. The last control variable is leverage which shows a significant negative relation at the 5% level with Tobin's Q (r = -0.183*). Other relations between leverage and the accounting-based performance indicators and MBV are not significant. Leverage is also positively related at the 1% significance level with board size (r = 0.190*) and LnAssets (r = 0.238**), suggesting that firms that are higher leveraged are larger and have bigger boards. Moreover, board size and LnAssets are also strong positively correlated (r = 0.751**), which makes sense because larger firms tend to have more directors on their boards.

Table 7: Pearson's correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	ROA	1.000															
2	ROE	0.790**	1.000														
3	Tobin's Q	0.000	0.030	1.000													
4	MBV	-0.080	-0.079	0.694**	1.000												
5	RET	0.281**	0.267**	0.175*	0.014	1.000											
6	ExeBoard	0.122	0.082	-0.020	0.011	0.153	1.000										
7	SupBoard	0.192*	0.127	-0.006	0.027	0.080	0.294**	1.000									
8	BoardSize	0.204**	0.136	-0.013	0.026	0.126	0.641**	0.922**	1.000								
9	OutDir	0.034	0.017	0.005	0.009	-0.061	-0.569**	0.554**	0.214**	1.000							
10	OwnCon	0.038	0.045	-0.061	-0.146	-0.032	-0.063	-0.360**	-0.315**	-0.270**	1.000						
11	InsiderOwn	-0.154	-0.194	0.062	0.024	-0.041	-0.126	-0.396**	-0.344**	-0.349**	0.617**	1.000					
12	LnTotComp	0.292**	0.221**	-0.048	0.027	0.128	.0559**	0.674**	0.773**	0.040	-0.294**	-0.206	1.000				
13	LnTotComp1	0.294**	0.217**	-0.046	0.028	0.080	0.270**	0.697**	0.673**	0.313**	-0.332**	-0.244*	0.944**	1.000			
14	LnAssets	0.378**	0.288**	-0.216**	-0.131	0.152	0.414**	0.726**	0.751**	0.214**	-0.230**	-0.077	0.815**	0.791**	1.000		
15	LnAge	0.266**	0.242**	-0.011	-0.031	0.167*	0.067	0.056	0.072	-0.001	-0.037	-0.126	0.086	0.067	0.153	1.000	
16	Leverage	0.078	0.083	-0.183*	0.046	-0.049	0.146	0.163*	0.190*	-0.033	-0.023	0.144	0.125	0.083	0.238**	-0.021	1.000

Notes: This table presents Pearson's correlations between the variables used in this study. **, Correlation is significant at the 0.01 level (2-tailed). *, Correlation is significant at the 0.05 level (2-tailed).

5.3   Regression results

The following paragraphs describe the hypotheses and the empirical results of the performed OLS regressions. Each sub-section present results of the three main corporate governance mechanisms for this research; board structure, ownership structure and executive compensation. Table 8 reports the results of the OLS regressions including board structure variables. Table 9 reports the results of the OLS regressions including the ownership structure variables. Table 10 reports the results of the OLS regressions including the executive compensation variables.

In the correlation matrix is found that the accounting-based dependent variables are highly correlated among each other, and also the market-based dependent variables are. For the sake of brevity, only the ROA, ROE, Tobin's Q and RET are displayed in the main findings. The other dependent variables are displayed as alternative variables in the robustness tests, which are displayed and discussed after the main analysis. All models are controlled for industry effects (IND) and year-effects (YEAR). The different industry types are displayed in table 5. This study uses data from the years 2012 and 2017. To control for possible differences between these two periods, a single dummy variable is computed. In all regression tables, the adjusted R-squared is displayed to measure how well observed outcomes are replicated by the model. The extension adjusted R^2 is used to take account of the phenomenon that R^2 always increases when adding extra explanatory variables.

Additional tests are performed to test the presence of multicollinearity by calculating the variance inflation factor (VIF). The VIF results of the independent variables in this study are all lower that the threshold of 5, this means that the multicollinearity problem does not apply in this study. The results of the VIF values are reported in appendix C.

5.3.1   Board structure

The first internal corporate governance mechanism that is analyzed is board structure. The results of the OLS regressions are presented in table 8. The variables that have been investigated in this section are board size (hypothesis 1a) and the number of outside directors (hypothesis 1b). For both variables, a negative impact on firm performance is expected. In the first model, the regressions between board size and different firm performance measures can be observed. The second model includes a variable that measures the percentage of outside directors on the board and shows the relationship with the different firm performance variables.

Board size

The second model of table 8, shows a negative impact at the 10% significance level of BoardSize on accounting-based variables ROA (β=-0.010*, t=-1.784), and on ROE (β=-0.039*, t=-1.932). Surprisingly, looking at the market-based/hybrid performance measure, a positive impact at the 5% level is found with Tobin's Q as dependent variable (β=0.125**, t=2.331). As seen in the correlation matrix, BoardSize was positively related to LnAssets, which is logically since bigger firms usually have bigger boards. After removing the variable LnAssets

in the regression which is done in model 1, BoardSize tend to have a positive effect on ROA (β=0.009**, t=2.298). This is only the case for ROA, removing LnAssets in regressions with other dependent variables does not significantly affect the relations. Moreover, including LnAssets in model 2 leads to a higher adjusted R-squared. Leverage show positive correlations with BoardSize in the correlation matrix, however removing this variable did not lead to other results in any of the regressions (results are not displayed in the table). There is no relationship found between RET and board size (β=0.000, t=-0.014) in this analysis. Robustness tests need to be performed to investigate if the relations found in model 2 hold if other control variables are included.

The positive results on the market-based measures are not in line with previous studies. Florackis (2005) and Guest (2009) found both negative results with Tobin's Q. For the Netherlands, Postma et al. (2003) found negative relations between board size and firm performance. This corresponds with the negative effects of board size found on the accounting-based measures in table 8.

Outside directors

In model 3 of table 8, outside directors is measured as a percentage of the total board. In the table, no significant impact can be found on all dependent variables. The variables ROA, ROE and RET show negative signs (β=-0.072, t=-0.713, β=-0.227, t=-0.656 and β=-0.289, t=-1.287), while Tobin's Q show positive signs (β=0.571, t=0.622), though all insignificant. The variable OutDir showed positive correlations with LnAssets and Leverage in the correlation matrix, though removing these variables did not lead to other results. Robustness tests need to be performed to test if other relations show up under different situations.

Looking at the control variables in table 8, they show most of the time significant relations with the firm performance measures. Firm size has a positive and significant impact on the accounting-based performance measures and on RET. Negative and significant impacts of firm size have been found for Tobin's Q. Firm age also has a significant and positive relation with the accounting-based measures. There is no significant relation found between firm age and the market-based measures. For leverage, negative effects at the 10% significance level are found for Tobin's Q. The adjusted R-squared values show, compared with the other models, much higher values for the models of RET. This is probably caused by the variable LnAssets. Replacing it by another control variable for firm size (see robustness tests) lead to higher adjusted R-squared values for the accounting-based measures. Comparing the adjusted R-squared value with prior studies, Guest found adjusted R-squared values of 0.319 for ROA, 0.288 for Tobin's Q and 0.178 for RET. The values of the study of Andres, Azofra and Lopez (2005) are almost similar with this study. Concerning Dutch research, van Ees and Sterken (2003) used R^2 instead of adjusted R^2. This is difficult to compare since their study uses more variables in one regression, which may increase R^2.

Table 8: The relationship between board structure and firm performance

	ROA (t+1)			ROE (t+1)			Tobin's Q (t+1)			RET (t+1)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
BoardSize	0.009**	-0.010*		0.018	-0.039*		0.005	0.125**		0.014	0.000	
	(2.298)	(-1.784)		(1.324)	(-1.932)		(0.150)	(2.331)		(1.610)	(-0.014)	
OutDir			-0.062			-0.227			0.571			-0.289
			(-0.639)			(-0.656)			(0.622)			(-1.287)
LnAssets		0.028***	0.020***		0.084***	0.055***		-0.171***	-0.074*		0.021	0.023**
		(4.470)	(4.744)		(3.796)	(3.564)		(-2.940)	(-1.865)		(1.412)	(2.398)
LnAge	0.037***	0.023***	0.031***	0.124***	0.100***	0.108***	-0.032	0.015	-0.008	0.040*	0.035	0.034
	(2.298)	(2.847)	(3.011)	(3.295)	(2.746)	(2.940)	(-0.323)	(0.157)	(-0.079)	(1.662)	(1.417)	(-1.397)
Leverage	0.047	0.011	0.009	0.232	0.094	0.082	-1.123**	-0.901*	-0.887*	-0.126	-0.152	-0.164
	(0.820)	(0.207)	(0.161)	(1.109)	(0.463)	(0.395)	(-2.162)	(-1.761)	(-1.701)	(-0.989)	(-1.184)	(-1.279)
Constant	-0.215***	-0.378***	-0.317***	-0.775***	-1.268***	-1.039***	2.085***	3.071***	2.451**	-0.007	-0.126	0.041
	(-3.596)	(-5.634)	(-3.665)	(-3.712)	(-5.320)	(-3.364)	(3.814)	(4.879)	(2.997)	(-0.052)	(-0.798)	(0.202)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.069	0.173	0.158	0.068	0.145	0.126	0.038	0.086	0.054	0.289	0.294	0.302
N	160	160	160	160	157	157	153	153	153	152	152	152

Notes: This table presents the results of the OLS regressions of board structure and firm performance. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

5.3.2 Ownership structure

Table 9 presents the results of the OLS regressions conducted with independent variable ownership concentration (OwnCon) in model 1 and insider ownership (InsiderOwn) in model 2. The variables are not taken together in one model, since there was a high correlation found between these two variables in the correlation matrix.

Ownership concentration

From the results of the first model of table 9, it can be observed that ownership concentration shows a positive effect on the accounting-based performance measure ROA (β=0.078*, t=1.717). For ROE (β=0.202, t=1.244), no significant relation is found. The positive sign is also found in the studies from Donker (2009) and Frijns et al. (2007) investigating the Netherlands. Looking at the market-based/hybrid measures, the relations with ownership concentration are not significant. Robustness test needs to be performed to test if these relationships hold systematically.

Insider ownership

The variable InsiderOwn represents the shares held by insider shareholders and the results are stated in model 2 of table 9. The table shows no significant relations between insider ownership and ROA (β=-0.049, t=-1.156), ROE (β=-0.178, t=-1.442), Tobin's Q (β=0.344, t=0.800) and RET (β=0.054, t=0.478). Firms without insider ownership are not included in the regressions of model 2, therefore the N in model 2 is lower than in model 1. Replacing the missing values by zeros for firms that do not have insider ownership does not lead to other significant results. The correlation matrix in chapter 5.2 stated a significant negative correlation between insider ownership and LnAssets. After removing the variable LnAssets from the regressions (not displayed in the table), the relation between ROE and insider ownership becomes significant at the 10% level and a negative effect is found (β=-0.221*, t=-1.718). Removing LnAssets had no effect on all other regressions. Other combinations or exclusions of control variables do not show different results. Alternative regressions are performed in the second next paragraph to investigate any possible effects between different ownership identities, and investigate the relations under other circumstances.

The control variables in this table do not show specific differences with previous results. Again here, the adjusted R-squared is higher at the RET model, however after replacing LnAssets with another control variable, the explanatory power increases. Prior research from Balsmeier and Czarnitzki (2017) had a lower adjusted R^2. Kaserer and Moldenhauer (2007) had quite similar explanatory power compared with this study.

Table 9: Relationship between ownership structure firm performance

	ROA (t+1)		ROE (t+1)		Tobin's Q (t+1)		RET (t+1)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
OwnCon	0.078*		0.202		-0.674		0.080	
	(1.717)		(1.244)		(-1.584)		(0.754)	
InsiderOwn		-0.036		-0.178		0.344		0.054
		(-0.819)		(-1.442)		(0.800)		(0.478)
LnAssets	0.021***	0.018***	0.056***	0.043***	-0.80**	-0.103**	0.022**	0.019
	(5.013)	(3.601)	(3.699)	(2.985)	(-2.058)	(-2.144)	(2.253)	(1.478)
LnAge	0.031***	0.021	0.108***	0.036	-0.007	-0.182	0.034	-0.027
	(3.022)	(1.550)	(2.952)	(0.923)	(-0.067)	(-1.378)	(1.412)	(-0.787)
Leverage	0.010	-0.065	0.087	-0.012	-0.896*	-1.807***	-0.155	-0.391**
	(0.179)	(-0.933)	(0.422)	(-0.055)	(-1.734)	(-2.692)	(-1.205)	(-2.183)
Constant	-0.390***	-0.225***	-1.267***	-0.591**	3.106***	3.907***	-0.163	0.237
	(-5.642)	(-2.651)	(-5.125)	(-2.472)	(4.731)	(4.786)	(-1.003)	(1.100)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.159	0.109	0.133	0.090	0.068	0.137	0.297	0.306
N	160	92	157	90	153	90	152	89

Notes: This table presents the results of the OLS regressions of ownership structure and firm performance. InsiderOwn includes family and managerial ownership. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

5.3.3 Executive compensation

The last corporate governance mechanism that is tested in this study is executive compensation (LnTotComp). Table 10, model 1 shows for the dependent variable ROA and ROE insignificant relations (β=-0.006, t=-0.399 and β=-0.034 t=-0.678). Positive signs of the coefficients have been found with market-based/hybrid performance measure Tobin's Q at the 5% significance level (β=0.291**, t=2.237). Total compensation shows no impact on RET (β=0.006, t=0.187). Model 3 shows regressions without the control variable LnAssets, which was heavily correlated with ROA, ROE and LnComp. Removing this variable in model 3 resulted in a positive significant impact on ROA and ROE. However, the adjusted R-squared decreases after removing this variable, and the model is not controlled for firm size. The robustness tests include an alternative measure for firm size, and show if these relationships hold.

For robustness, the alternative variable LnTotComp1 is conducted. As seen in the correlation matrix, executive compensation was highly correlated to the number of board members. LnTotComp1 is therefore included and is calculated by the total compensation divided by the number of executive board members. Nevertheless, no major differences between model 1 and model 2 were found in the regressions with this variable. The positive relation with market-based/hybrid performance measure Tobin's Q, corresponds with empirical evidence from Ozkan (2011) and Elston and Goldberg (2007). Looking at the control variables, no remarkable differences are found in this table compared with previous findings. For robustness, in the next paragraph a second analysis is made which analyzes the different components of total executive compensation. There are also other robustness tests made to test if the relation holds in other situations.

Table 10: Relationship between executive compensation and firm performance

	ROA (t+1)			ROE (t+1)			Tobin's Q (t+1)			RET (t+1)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
LnTotComp	-0.006		0.029***	-0.034		0.072**	0.291**		-0.019	0.006		0.035*
	(-0.399)		(3.596)	(-0.678)		(2.548)	(2.237)		(-0.257)	(0.187)		(1.907)
LnTotComp1		-0.001			-0.027			0.279**			-0.026	
		(-0.039)			(-0.485)			(1.950)			(-0.724)	
LnAssets	0.022***	0.020***		0.069**	0.064**		-0.197***	-0.172***		0.018	0.030**	
	(2.943)	(2.787)		(2.555)	(2.480)		(-2.872)	(-2.644)		(1.060)	(1.871)	
LnAge	0.030***	0.031***	0.036***	0.102***	0.104***	0.122***	0.025	0.022	-0.030	0.035	0.031	0.040
	(2.890)	(2.940)	(3.447)	(2.742)	(2.772)	(3.274)	(0.253)	(0.222)	(-0.302)	(1.398)	(1.262)	(1.629)
Leverage	0.010	0.013	0.046	0.097	0.096	0.232	-0.769	-0.749	-1.113**	-0.143	-0.163	-0.112
	(0.186)	(0.228)	(0.836)	(0.462)	(0.451)	(1.123)	(-1.473)	(-1.420)	(-2.135)	(-1.093)	(-1.239)	(-0.879)
Constant	-0.342***	-0.353***	-0.350***	-1.120***	-1.402***	-1.142***	2.166***	1.470**	2.247***	-0.145	-0.070	-0.151
	(-4.660)	(-4.607)	(-4.649)	(-4.315)	(-4.767)	(-4.318)	(3.155)	(1.899)	(3.195)	(-0.840)	(-0.390)	(-0.876)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.155	0.155	0.112	0.132	0.131	0.099	0.079	0.071	0.032	0.294	0.297	0.293
N	158	158	158	155	155	155	151	151	151	150	150	150

Notes: This table presents the results of the OLS regressions of executive compensation and firm performance. LnTotComp is the natural logarithm of the total executive compensation. LnTotComp1 is an alternative measure, which represents the compensation per executive board member. Total compensation exists of the components; base salary, bonusses, other emoluments, share-based rewards and pension contributions. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

5.4   Robustness tests

To test if previous results hold under different circumstances, multiple robustness tests are performed. For some independent variables used in this study, additional measures can be used to analyze more thoroughly the effects. Furthermore, previous studies used different measurement variables for financial performance, which are also analyzed in the next regressions. Controlling with other control variables, regression without lagged variables and regression by year subsample are also suitable robustness checks which are performed. The tables with the results of the tests are included in the appendices, and the findings are discussed below. Appendix D shows the definitions, descriptive statistics and correlation matrix of the alternative variables used in the robustness tests.

5.4.1   Alternative independent variables

Board structure

In the main analysis, a negative effect of board size on accounting-based performance measures was found. Also, positive effects of board size on Tobin's Q are found. There was no effect found for the relation between the percentage of outside directors and firm performance, therefore an additional analysis is made in table 11, which uses the number of executive board members and supervisory board members (outside directors) instead of a percentage. In appendix D, table 11, model 1 shows no significant relationships between the number of executive members and any of the firm performance measures.

In model 2, there is a significant negative relation found between the number of supervisory board members and ROA (β=-0.011*, t=-1.660) and also ROE (β=-0.042*, t=-1.766). The number of outside directors seem to have a significant positive impact on Tobin's Q (β=0.149**, t=2.392). There is no impact found on RET. Model 3 includes both the number of executive board members as the supervisory board members. The directions and significance remain in this model. Corresponding with the main analysis, no significant effects on RET are found.

Ownership structure

As discussed in the methodology chapter, ownership concentration can be measured in other ways than the percentage shares held by the largest shareholder. A second method is the percentage of shares held by the largest five shareholders. Table 15 in appendix E includes this method with the variable OwnCon5. As can be seen is this table, ownership concentration is positively related with ROA (β=-0.011*, t=-1.660), which corresponds with the main analysis. The ROE is again almost significant at the 10% level (t=1.327). Tobin's Q and RET did not show significant results.

The main analysis included insider ownership as variable. The opposite variable, outsider ownership is tested in table 15, model 2. A positive effect of outsider ownership on ROA is found (β=0.109**, t=2.186), and a negative effect on Tobin's Q (β=-0.953*, t=-1.982) is found. Therefore, based on these outcomes it can be suggested that outside owners (corporates, banks, institutions) have positive effects on return on assets, and negative

effects on Tobin's Q. To analyze all these identity types separately, table 16 and table 17 are prepared in appendix F. Table 16 presents the results of the OLS regressions with different ownership identities and accounting-based performance measures. Table 17 presents the relation with market-based/hybrid measures. A positive, significant effect on ROA and ROE was found for family ownership (FamOwn) (β=0.166***, t=2.583, β=0.423***, t=1.825). The positive effect of family ownership is in line with previous research from e.g. Villalonga and Amit (2006) and Maury (2006). Management ownership shows insignificant relations with all performance variables. Remarkable is that the signs are negative at the accounting-based measures which is different than family ownership and may have influenced the insider ownership variable in the main analysis. Looking at previous empirical evidence from other studies about managerial ownership, mixed effects are found. Maury (2006) found positive effects, while Krivogorsky (2006) found negative effects. Kaserer and Moldenhauer (2007) found positive effects of insider ownership, including both family and managerial ownership.

Institutional ownership (InsOwn) shows insignificant effects on firm performance. Corporate ownership shows a positive and significant relation at the 1% level on ROA (β=0.159***, t=2.727). Bank ownerships shows a positive relation with Tobin's Q (β=3.937***, t=2.072). Remarkable is that the relation between Tobin's Q and outsider ownership was found to be negative, while bank ownership itself was found to be positive. Therefore, the negative effect seemed to be caused by institutional and corporate ownership.

State ownership was discussed in the literature review, however is not included in the analysis, since there were only three cases where a state was a (very small) shareholder in a Dutch firm, which was not enough to conduct a good regression and draw conclusions. Tables 16 and 17 include all firms, meaning that when a firm does not have that specific ownership identity, a zero is taken in the regression. Excluding these firms leads to a lower sample size but did not change the effects much. Only the effects for family ownership became less significant in these regressions (tables are not displayed for the sake of brevity).

Executive compensation

The main analysis used total executive compensation as variable in the regression. Table 18 in appendix G contains the different components of executive compensation separately, regressed with the performance measures. The components analyzed in this study are base salary (LnBasesalary), bonus (LnBonus), other emoluments (LnOther), share-based rewards (LnShareBased) and pension (LnPension). For the sake of brevity, only ROA and Tobin's Q are displayed, since the other accounting-based and market-based performance measures show quite similar results.

No significant relation is found between any component of executive compensation and ROA. Looking at Tobin's Q, bonus (β=0.172*, t=1.660) and pension (β=0.185*, t=-1.886) show a positive relation at the 10% significance level. These components separately explain the positive and significant effect between total executive compensation and Tobin's Q which was found in the main analysis.

5.4.2 Alternative performance measures

This study used as performance variables ROA and ROE, Tobin's Q and stock return. In appendix H, ROA based on net income (ROAnet_ic), ROE based on operating income (ROEop_ic), and market-to-book value (MBV) are used as dependent variables. As can be observed, the results of table 19 and table 20 are consistent with the main results in chapter 5.3. Board size is still negatively related with ROEop_ic (β=-0.038*, t=-1.944), and positively related with market-based variable MBV (β=0.281*, t=-1.771). Also in this model, no significant effect of outside directors on firm performance is found. Ownership concentration is still positively related with ROAnet_ic (β=0.078*, t=1.717), and negatively with the market-based/hybrid variable MBV (β=-3.325***, t=-2.703). Insider ownership shows at all models insignificant relations with the performance variables. Taken family ownership separately (not displayed in the table), a positive relation is found on ROAnet_ic (β=0.151**, t=2.233). No significant effects for managerial ownership are found. Looking at executive compensation, negative relations are found for ROEop_ic (β=-0.023***, t=-4.709). A positive relation is found for MBV (β=1.018***, t=2.678), which corresponds with the market-based measures in the main analysis. The results of the control variables also correspond with previous analysis.

5.4.3 Alternative control variables

This study used total assets, age, leverage, an industry-dummy and year-dummy as control variables. As discussed in chapter 3.5, some other studies used total sales and long-term debt as control variables. These control variables are also used in a robustness test which is presented in appendix I. The results correspond with the results in the main analysis. Board size is still negatively related with ROA (β=-0.010*, t=-1.949). Tobin's Q show a positive relation which is significant at the 10% level (β=0.079*, t=-1.919). Outside directors still shows insignificant results. Ownership concentration has a positive impact on ROA (β=0.090**, t=2.107) and a negative impact on Tobin's Q (β=-0.640*, t=-1.816). For insider ownership are no significant results found, though family ownership separately shows positive effects on ROA (β=0.149**, t=2.450, not displayed in the table). Total executive compensation is still negatively related with ROA (β=-0.022*, t=-1.767) and positively related with Tobin's Q (β=-0.385***, t=-3.806). The results of the control variables correspond with the control variables from other analyses. The natural logarithm of total annual sales is even as LnAssets significantly and positively related to ROA and negatively related to Tobin's Q. Leverage based on long-term debt shows no significant effects, however leverage does not do this as well in most of the main analysis.

5.4.4 Regression without lagged variables

As stated before, this study followed the idea that corporate governance variables do not change much over time. To check whether the lagged variables made a difference in the analyses, a model without lagged variables is made and presented in appendix J. In this analysis, board size is negatively related to ROA (β=-0.011**, t=-2.201) which corresponds

with previous findings. The number of outside directors has again, according to the analysis, no significant effect on firm performance. It can be observed that ownership concentration has a negative impact on Tobin's Q (β=-0.010*, t=-1.762). This corresponds with previous findings. For insider ownership is again no significant relation found. The results of the regression between performance and total compensation are not significant. The different results can be caused by the fact that executive compensation is often partially related to last year performance. In this robustness model, the compensation data is from the same year as the performance data. It can be argued that there is still a lag of one-year because variable compensation is based on previous year results. Therefore, it also can be argued that the main model actually has a two-year lag concerning the variable compensation. The control variables in the regressions show same results as previously found.

5.4.5   Regression year subsample

The last robustness tests split up the observations from the years 2012 and 2017 to investigate if there are any differences exist between the years that may harm the results in the main analysis. The results are presented in appendix K, table 23 and table 24. Board size show for 2017 a significant negative relation with ROA (β=-0.013*, t=-1.630) and for 2012 a positive relation with Tobin's Q (β=0.175**, t=-1.740). The percentage of outside directors on the board show insignificant relations for both years. Ownership concentration has a negative impact on Tobin's Q for 2012 (β=-1.406*, t=-1.848). Insider ownership show insignificant results for both years, but family ownership on itself show positive relations at the 10% significance level on ROA in 2017 (β=0.148*, t=1.811, not displayed in the tables) and for 2012 (β=0.221*, t=1.854, not displayed in the tables). All these directions correspond with the findings in chapter 5.3. Total executive compensation has in 2012 a positive impact on Tobin's Q (β=0.654**, t=2.464). Previous findings show also positive relations. The results of the control variables correspond with previous findings. Overall, the results per year do not differ mutually.

6.   Conclusion

This chapter gives the conclusion which are drawn from the findings of the previous chapter. Furthermore, the limitations of this research and possible recommendations for further research are given.

6.1   Conclusions

The main research question presented in chapter 1.1 is as follows; *What is the impact of internal corporate governance mechanisms on the performance of Dutch listed firms?* This research question has been investigated by examining the three main internal corporate governance mechanisms; board structure, ownership structure and executive compensation. This research has investigated data from the years 2012 and 2017. This time span is chosen because the investigated corporate governance mechanisms are often seen as quite stable over time. A total of 160 firm-year observations has been analyzed using OLS regressions. As dependent firm performance variable is chosen for accounting-based variables ROA and ROE, and for market-based variables Tobin's Q and RET.

The first corporate governance mechanism that has been investigated is board structure, which is divided into two parts. Board size is the first variable that has been analyzed. Hypothesis 1a stated a negative impact of board size on firm performance. The main analysis found indeed negative effects on accounting-based measures ROA and ROE, however a positive effect was found for market-based/hybrid performance measure Tobin's Q. The negative impact found suggests that the bigger the board, the less managerial control and therefore higher agency costs. The positive effects found in the results of the market-based measures may suggest that firms with larger boards benefits from the greater experience, knowledge and connections that these boards possesses. This might lead to less risk and more trust by investors, resulting in better market-based performance measures. In all the robustness test, the relations hold systematically. This means that the hypothesis can only be partially accepted. The impact of board size on firm performance depends on how firm performance is measured. Summarizing, board size has a negative impact on accounting-based performance measures, and a positive impact on market-based/hybrid performance measures.

The second variable that has been analyzed concerning board structure is outside directors. Outside directors is measured as a percentage of members on the executive and supervisory board in total. Hypothesis 1b stated a negative impact of outside directors on firm performance. Overall, the results were not robust enough to accept the hypothesis. In the main results, insignificant effects on firm performance are found. The robustness tests remain insignificant. One additional analysis has been made which uses the number of supervisory board members instead of a percentage. These regressions stated negative effects on ROA and ROE, and positive effects on Tobin's Q, however these single tests on itself are not robust enough to accept the hypothesis.

Ownership structure is the second corporate governance mechanism that is investigated in this research. Ownership structure can be divided in ownership concentration and ownership identity. Hypothesis 2a stated that ownership concentration has a positive impact on firm performance. In the main analysis a positive relation between ownership concentration and ROA is found. In the robustness tests, the relations with ROE, Tobin's Q and the alternative accounting-based and market-based performance measures became significant. Overall, the impact of ownership concentration on firm performance depends on how firm performance is measured. In this study, a positive effect on accounting-based, and a negative effect on market-based/hybrid measures is found. Therefore, the null hypothesis can be partially accepted. The positive effect on the accounting-based measures can be explained by less agency costs when ownership concentration is high. Meaning that if there are a few owners in a firm, it leads to less information asymmetry between owners and managers resulting in better strategic decisions and higher performance. The negative effect on the market-based measures suggests that firms with higher ownership concentration perform less, because of the expropriation of wealth from smaller shareholders. New smaller investors also may be put off by the large shareholders. This entrenchment effect may lead to lower performance.

Hypothesis 2b was about insider ownership and stated that insider ownership has a positive effect on firm performance. In this study, family and managerial ownership together are treated as insider ownership which has been done by other researchers previously. In the main analysis, there is no significant relation found between insider ownership and the performance measures. In the robustness tests are again no significant effects found, however it became clear that family and managerial ownership have a different effect on firm performance. Analyzing family and managerial ownership separately found a significant positive relationship between family ownership and the accounting-based performance measures. The positive effects of family ownership may be caused by the less agency costs of these firms. Starting from the stewardship theory, family owners behave as farsighted stewards of their companies that intensely invest in long-term activities and focusing on continuity. For managerial ownership, no significant effects found, but it appears that it has systematically opposite effects in the regressions, compared with family ownership, on firm performance. The negative effect of managerial ownership can be caused by agency conflicts, managers might make decisions in their own best interests. Also, large managerial ownership might lead to expropriation of the other smaller shareholders. There is not enough evidence found to support the null hypothesis. This study found positive and significant relations between family ownership and accounting-based performance measures, but the effects on market-based measures and the effects of managerial ownership on firm performance are not found.

Hypothesis 3 stated that executive compensation has a positive effect on firm performance. The main analysis stated positive effects on Tobin's Q. The significant relations with accounting-based measures appeared in several robustness tests, however these relations were negative. Market-based/hybrid performance measures had again a positive

relation in the robustness tests. Therefore, the hypothesis can be partially accepted. Total executive compensation has a positive influence on market-based/hybrid performance measures and negative influence on accounting-based performance measures. Regarding the positive impact, it suggests that executive compensation mitigates agency problems, and generating better performance. Higher compensation to executives may also be an indication to shareholders and other investors that the firm is performing stably and well. The negative impact found on accounting-based measures is not in line with the results of previous studies and the hypothesis. An additional analysis was made to investigate if there are differences between the different components of executive compensation. The components bonus and pension have positive impact on Tobin's Q, and for the other components no significant relation is found. No significant results have been found for ROA, however remarkable is that base salary is the only component that has a negative sign, which may cause the negative effect that was found for total compensation in the main analysis.

6.2 Limitations and recommendations

This section discusses the limitations of this study and recommendations for future research. This research showed some relevant results in the context of internal corporate governance mechanisms and firm performance in the Dutch context, however it is important to mention that there are, as in every research, some limitations. The first limitation of this study is the sample size. Two years are taken with a time-span of 5 years, however only 160 Dutch listed firms remained in the study. This is approximately the same than other relevant Dutch studies, but less than other Anglo-American or Continental European studies. Some studies have gathered and analyzed data of a bigger time-span or longer periods, resulting in a larger sample size. A second limitation is that only listed firms have been included in this research. Large publicly listed companies are exposed to certain legislations and regulations in contrast to privately held companies. Data of unlisted firms is much more difficult to gather, but may give other insights. Because of the small sample size, industry types were pooled in this study to have substantial sample sizes per industry. Replicating this method in further studies concerning different countries might impact the results.

Based on the approach and results of this study and the limitations described above, several recommendations for future research are provided. The first recommendation is to include more years, a bigger time-span, multiple countries or unlisted firms. A bigger sample size will result in higher reliability, validity and more significant results. This also make it more suitable to find more significant results of specific ownership identity types or executive compensation components.

A second recommendation for future research is to use other statistical models. OLS is an often-used regression model, however models used in some other studies are 2SLS, 3SLS, GLS and fixed/random effects.

The third recommendation is to solve endogeneity problems differently than in this study. This study uses a one-year lag for the independent variables. In future studies this can

be multiple years. There is also a possibility that the relationship is the other way around and that corporate performance explains how ownership is structured, how many members are on the board or how much compensation board members receive. Future research can vary in which and how many years variables are lagged.

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Appendix A – Sample firms, industry classification and available years

Company name	Reclassified industry type	2012/ 2013	2017/ 2018
Aalberts Industries N.V.	Manufacturing		
Accell Group N.V.	Manufacturing		
AFC Ajax N.V.	Other services		
AkzoNobel N.V.	Manufacturing		
Altice Europe N.V.	Other services		
Alumexx N.V.	Manufacturing		
AMG N.V.	Manufacturing		
Amsterdam Commodities N.V.	Agriculture, retail and transport		
AND International Publishers N.V.	Other services		
Arcadis N.V.	Other services		
ASM International N.V.	Manufacturing		
ASML Holding N.V.	Manufacturing		
Avantium N.V.	Manufacturing		
Ballast Nedam N.V.	Construction and mining		
Basic-Fit N.V.	Other services		
Batenburg Techniek N.V.	Construction and mining		
BE Semiconductor Industries N.V.	Manufacturing		
Beter Bed Holding N.V.	Manufacturing		
Bever Holding N.V.	Real estate		
Brunel International N.V.	Other services		
C/TAC N.V.	Other services		
Corbion N.V.	Manufacturing		
Core Laboratories N.V.	Construction and mining		
Crown Van Gelder N.V.	Agriculture, retail and transport		
Curetis N.V.	Other services		
DGB Group N.V.	Other services		
DPA Group N.V.	Other services		
Ease2Pay N.V.	Manufacturing		
Envipco Holding N.V.	Agriculture, retail and transport		
Esperite N.V.	Agriculture, retail and transport		
Eurocommercial Properties N.V.	Real estate		
ForFarmers N.V.	Agriculture, retail and transport		
Fugro N.V.	Other services		
Galapagos N.V.	Other services		
Gemalto N.V.	Other services		
Grandvision N.V.	Agriculture, retail and transport		
Heijmans N.V.	Construction and mining		
Heineken N.V.	Manufacturing		
Holland Colours N.V.	Manufacturing		

Company name	Reclassified industry type	2012/2013	2017/2018
Hunter Douglas N.V.	Manufacturing	green	green
Hydratec Industries N.V.	Manufacturing	green	green
ICT Group N.V.	Other services	green	green
IEX Group N.V.	Other services	grey	green
IMCD N.V.	Manufacturing	grey	green
Intertrust N.V.	Other services	grey	green
Kardan N.V.	Real estate	green	green
Kendrion N.V.	Manufacturing	green	green
Kiadis Pharma N.V.	Manufacturing	grey	green
Koninklijke Ahold Delhaize N.V.	Agriculture, retail and transport	green	green
Koninklijke BAM Groep N.V.	Construction and mining	green	green
Koninklijke Boskalis Westminster N.V.	Construction and mining	green	green
Koninklijke Brill N.V.	Other services	green	green
Koninklijke DSM N.V.	Manufacturing	green	green
Koninklijke KPN N.V.	Other services	green	green
Koninklijke Philips N.V.	Manufacturing	green	green
Koninklijke Porceleyne Fles N.V.	Manufacturing	green	green
Koninklijke Ten Cate N.V.	Manufacturing	green	grey
Koninklijke VolkerWessels N.V.	Construction and mining	grey	green
Koninklijke Vopak N.V.	Agriculture, retail and transport	green	green
Koninklijke Wessanen N.V.	Manufacturing	green	green
Lavide Holding N.V.	Other services	green	green
Lucas Bols N.V.	Manufacturing	grey	green
MKB Nedsense N.V.	Other services	green	green
Nedap N.V.	Manufacturing	green	green
Neways Electronics International N.V.	Manufacturing	green	green
Novisource N.V.	Other services	grey	green
NSI N.V.	Real estate	green	green
Nutreco N.V.	Manufacturing	green	grey
OCI N.V.	Manufacturing	grey	green
Oranjewoud N.V.	Other services	green	green
Ordina N.V.	Other services	green	green
Pharming Group N.V.	Manufacturing	green	green
PostNL N.V.	Agriculture, retail and transport	green	green
Randstad N.V.	Other services	green	green
RELX	Other services	green	green
Roodmicrotec N.V.	Manufacturing	green	green
Royal Dutch Shell	Construction and mining	green	green
Royal Imtech N.V.	Construction and mining	green	grey
SBM Offshore N.V.	Construction and mining	green	green

Company name	Reclassified industry type	2012/ 2013	2017/ 2018
SIF Holding N.V.	Manufacturing	Not available	Available
Signify N.V.	Manufacturing	Not available	Available
Sligro Food Group N.V.	Agriculture, retail and transport	Available	
Snowworld N.V.	Other services	Not available	Available
Stern Groep N.V.	Agriculture, retail and transport	Available	
Takeaway.Com N.V.	Other services	Not available	Available
TIE Kinetix N.V.	Other services	Available	Available
TKH Group N.V.	Manufacturing	Available	Available
TomTom N.V.	Manufacturing	Available	Available
Unilever	Manufacturing	Available	Available
USG People N.V.	Other services	Available	Not available
Vastned Retail N.V.	Real estate	Available	Available
Wereldhave N.V.	Real estate	Available	Available
Wolters Kluwer N.V.	Other services	Available	Available
Total		**73**	**87**

Available (green)	=	Available
Not available (grey)	=	Not available

Appendix B – Data transformations
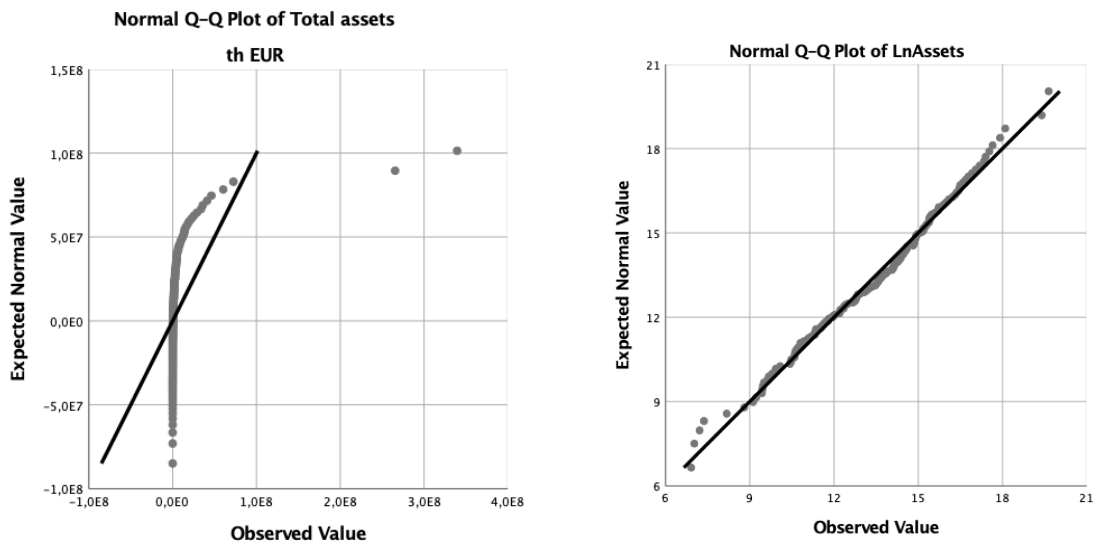
Figure 3: Firm size transformation to natural logarithm
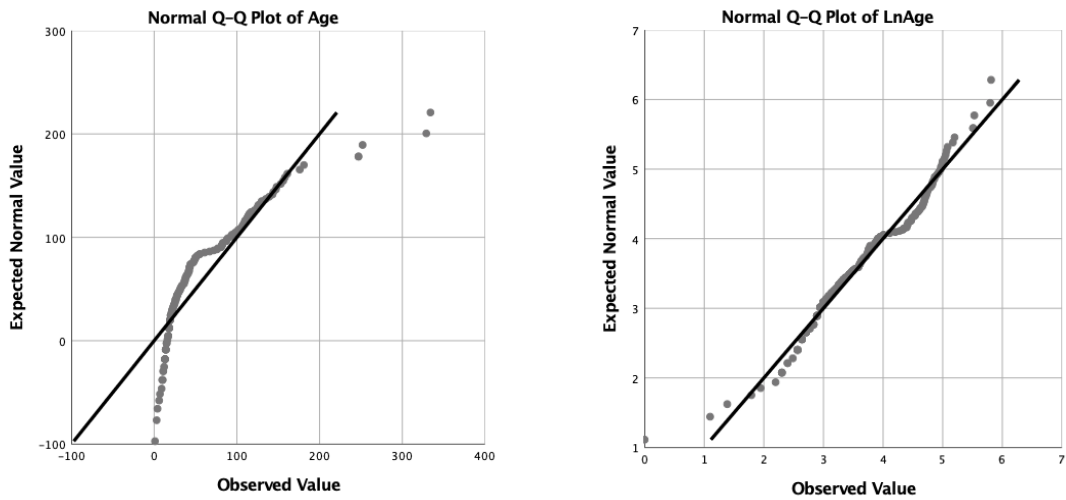
Figure 4: Firm age transformation to natural logarithm
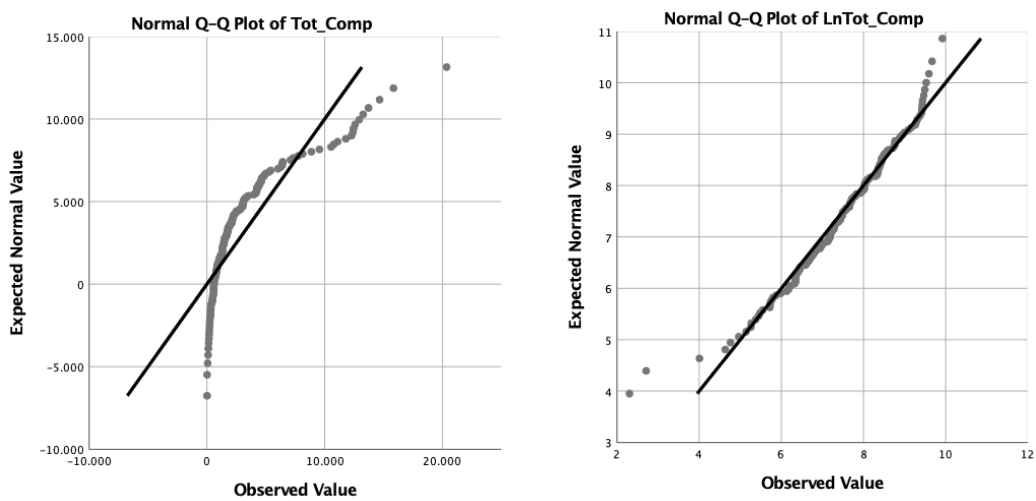
Figure 5: Total executive compensation transformation to natural logarithm

Appendix C – VIF values of main analysis

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Total board	,395	2,532
	LnAssets	,372	2,688
	LnAge	,897	1,114
	Leverage	,893	1,120
	IND1	,802	1,247
	IND2	,709	1,410
	IND3	,729	1,372
	IND4	,774	1,293
	YearDummy	,990	1,010

a. Dependent Variable: ROA using P/L before tax

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	OutDir%	,939	1,065
	LnAssets	,821	1,218
	LnAge	,907	1,103
	Leverage	,886	1,128
	IND1	,801	1,248
	IND2	,709	1,410
	IND3	,727	1,376
	IND4	,843	1,186
	YearDummy	,990	1,010

a. Dependent Variable: ROA using P/L before tax

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Own_Con1	,909	1,100
	LnAssets	,833	1,200
	LnAge	,907	1,102
	Leverage	,892	1,121
	IND1	,803	1,246
	IND2	,697	1,435
	IND3	,726	1,377
	IND4	,836	1,197
	YearDummy	,976	1,025

a. Dependent Variable: ROA using P/L before tax

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Insider_Own	,930	1,075
	LnAssets	,901	1,109
	LnAge	,892	1,121
	Leverage	,820	1,219
	IND1	,819	1,221
	IND2	,776	1,288
	IND3	,811	1,233
	IND4	,859	1,164
	YearDummy	,937	1,067

a. Dependent Variable: ROA using P/L before tax

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	LnTot_Comp	,280	3,573
	LnAssets	,267	3,751
	LnAge	,885	1,130
	Leverage	,883	1,133
	IND1	,803	1,245
	IND2	,701	1,426
	IND3	,720	1,388
	IND4	,777	1,288
	YearDummy	,987	1,014

a. Dependent Variable: ROA using P/L before tax

Figure 6: VIF values of the main regression analysis

Appendix D – Definitions, descriptive statistics and correlation matrix of alternative variables

Table 11: Abbreviations and definitions of the alternative variables

Dependent variables		
Return on assets	ROAnet_ic	(Net income / (Total assets)
Return on equity	ROEop_ic	(Operating income) / (Shareholders' equity)
Market-to-book value	MBV	(Stock price * number of shares outstanding) / (Book value of equity)
Independent variables		
Executive board size	ExeBoard size	Number of executive board members
Supervisory board size	SupBoard size	Number of supervisory board members
Ownership concentration	OwnCon5	Percentage of shares held by the five largest owners
Family ownership	FamOwn	(Shares held by individual or family members) / (Total number of shares)
Management ownership	ManOwn	(Shares held by managers) / (Total number of shares)
Corporate ownership	CorpOwn	(Shares held by other firms) / (Total number of shares)
Bank ownership	BankOwn	(Shares held by banks) / (Total number of shares)
State ownership	StateOwn	(Shares held by governments) / (Total number of shares)
Outsider ownership	OutsiderOwn	(Shares held by banks, institutions and other firms) / (Total number of shares)
Base salary	LnBasesalary	Ln(Base salaries of all executive board members)
Bonusses	LnBonus	Ln(Bonusses of all executive board members)
Other emoluments	LnOther	Ln(Other emoluments of all executive board members)
Share-based rewards	LnShareBased	Ln(share-based rewards of all executive board members)
Pension contributions	LnPension	Ln(Pension contributions of all executive board members)
Control variables		
Firm size	LnSales	Ln(total sales)
Long-term Leverage	LTD Leverage	(Total long-term debt) / (total capital)

Notes: This table presents the definitions and abbreviations of the alternative variables used in the robustness tests.

Table 12: Descriptive statistics of the alternative variables

	Mean	Median	Std.dev.	Min	Max	P25	P75	N
Dependent variables								
ROAnet_ic	0.015	0.038	0.136	-0.480	0.350	-0.007	0.072	160
ROEop_ic	0.021	0.116	0.446	-2.206	0.729	0.008	0.179	157
MBV	2.713	1.783	3.313	-0.153	18.303	0.976	2.873	153
Independent variables								
ExeBoard size	2.381	2.000	1.075	1.000	6.000	2.000	3.000	160
SupBoard size	5.144	5.000	2.130	1.000	12.000	4.000	6.000	160
OwnCon5	0.459	0.405	0.249	0.030	0.997	0.273	0.641	160
FamOwn	0.206	0.109	0.202	0.031	0.781	0.052	0.303	56
ManOwn	0.289	0.167	0.276	0.000	0.975	0.056	0.498	56
CorpOwn	0.206	0.100	0.220	0.031	0.772	0.051	0.279	61
BankOwn	0.087	0.067	0.049	0.022	0.234	0.050	0.116	62
InsOwn	0.265	0.217	0.174	0.030	0.743	0.125	0.398	128
StateOwn	0.040	0.030	0.017	0.030	0.060	0.030		3
OutsiderOwn	0.361	0.325	0.223	0.030	0.932	0.185	0.509	144
Basesalary	1211.220	933.432	990.884	10.000	5829.000	502.500	1760.350	157
Bonus	953.295	326.442	1390.804	0.000	9271.000	164.000	1393.000	131
Other	226.712	111.090	381.595	0.000	2221.000	32.075	263.516	73
ShareBased	1471.658	613.000	1935.827	0.000	7010.868	168.374	1916.396	91
Pension	280.615	153.982	313.465	0.000	1920.000	60.973	429.342	138
Control variables								
Sales (mln €)	13.012	13.473	2.889	1.386	19.685	11.402	14.900	158
LTD Leverage	0.198	0.161	0.169	0.001	0.914	0.071	0.296	140

Notes: This table represents the descriptive statistics of the alternative variables used in this study. Data is from 2012 and 2017. Dependent variables are lagged one year and winsorized below the 2.5 and above the 97.5 percentiles. Financial firms are excluded. P25 represents the 25th percentile and P75 the 75th percentile of the variables. N is the number of observations. Basesalary, Bonus, Other, ShareBased and Pension are in thousands of Euros and represents all executive members. Variable definitions are given in table 11.

Table 13: Correlation matrix of the alternative variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	ROAnet_ic	1.000																		
2	ROEop_ic	0.797**	1.000																	
3	MBV	-0.035	-0.075	1.000																
4	ExeBoard size	0.140	0.077	0.011	1.000															
5	SupBoard size	0.214**	0.155	0.027	0.294**	1.000														
6	OwnCon5	-0.037	-0.027	-0.076	-0.087	0.450**	1.000													
7	FamOwn	0.075	0.025	0.034	0.121	-0.159	0.418**	1.000												
8	ManOwn	-0.152	-0.171	-0.083	-0.197	0.351**	0.659**	-0.079	1.000											
9	CorpOwn	0.081	0.053	-0.155	0.184	-0.110	0.622**	-0.190	-0.191	1.000										
10	BankOwn	0.141	-0.033	-0.131	-0.213	0.068	-0.031	0.211	-0.351	-0.063	1.000									
11	InsOwn	-0.107	-0.062	-0.124	-0.120	-0.225*	0.270**	-0.409**	-0.282	-0.280*	-0.208	1.000								
12	OutsiderOwn	0.022	0.023	0.924	0.001	-0.208*	0.591**	-0.398**	-0.333*	0.700**	0.058	0.630**	1.000							
13	LNBasesalary	0.243**	0.196*	-0.019	0.587**	0.603**	-0.347**	0.015	-0.165	-0.054	0.000	-0.262**	-0.197*	1.000						
14	LnBonus	0.323**	0.225*	0.051	0.456**	0.616**	-0.211*	-0.113	-0.032	0.068	-0.057	-0.217*	-0.143	0.737**	1.000					
15	LnOther	0.289*	0.333**	0.011	0.333**	0.501**	-0.211	-0.012	-0.058	-0.175	-0.042	-0.109	-0.076	0.643**	0.571**	1.000				
16	LnShareBased	0.162	0.156	0.062	0.343**	0.483**	-0.124	-0.122	-0.330	0.024	0.239	-0.236*	-0.017	0.533**	0.507**	0.306*	1.000			
17	LnPension	0.241**	0.122	0.119	0.510**	0.534**	-0.309**	-0.017	-0.305*	-0.005	0.175	-0.100	-0.048	0.758**	0.606**	0.403**	0.624**	1.000		
18	LNSales	0.420**	0.381**	-0.081	0.458**	0.651**	-0.359**	0.065	-0.106	-0.098	-0.032	-0.163	-0.154	0.793**	0.688**	0.646**	0.336**	0.656**	1.000	
19	LTD Leverage	-0.119	-0.048	-0.067	-0.067	0.135	-0.077	0.020	0.058	-0.068	0.322*	-0.286**	-0.205*	-0.089	0.203*	0.275*	0.117	0.141	-0.086	1.000

Notes: This table presents Pearson's correlations between the variables used in this study. **, Correlation is significant at the 0.01 level (2-tailed). *, Correlation is significant at the 0.05 level (2-tailed).

Appendix E – Robustness test, alternative independent variables

Table 14: Robustness test with other board variables

	ROA			ROE			Tobin's Q			RET		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ExeBoard	-0.006		-0.007	-0.026		-0.030	0.046		0.061	0.025		0.024
	(-0.633)		(-0.731)	(-0.727)		(-0.835)	(0.484)		(0.646)	(-1.084)		(1.301)
SupBoard		-0.011*	-0.011*		-0.042*	-0.043*		0.149**	0.152**		-0.012	-0.110
		(-1.660)	(-1.696)		(-1.766)	(-1.809)		(2.392)	(2.424)		(-0.739)	(-0.672)
LnAssets	0.020***	0.026***	0.028***	0.057***	0.079***	0.085***	-0.076*	-0.165***	-0.177***	0.016	0.028**	0.023
	(4.582)	(4.476)	(4.465)	(3.514)	(3.726)	(3.794)	(-1.813)	(-2.976)	(-3.019)	(1.543)	(2.012)	(1.564)
LnAge	0.031***	0.029***	0.029***	0.107***	0.102***	0.100***	-0.008	0.015	0.018	0.036	0.033	0.034
	(3.000)	(2.868)	(2.831)	(2.913)	(2.782)	(2.733)	(-0.079)	(0.156)	(0.180)	(0.105)	(1.343)	(-1.382)
Leverage	0.013	0.009	0.010	0.106	0.081	0.090	-0.914*	-0.881*	-0.888*	-0.155	-0.154	-0.157
	(0.238)	(0.167)	(0.191)	(0.513)	(0.395)	(0.438)	(-1.755)	(-1.724)	(-1.734)	(-1.213)	(-1.204)	(-1.226)
Constant	-0.352***	-0.382***	-0.382***	-1.168***	-1.279***	-1.279***	2.769***	3.156***	3.152***	-0.130	-0.155	-0.157
	(-5.318)	(-5.617)	(-5.606)	(-4.959)	(-5.297)	(-5.293)	(4.409)	(4.961)	(4.943)	(-0.843)	(-0.968)	(-0.979)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.158	0.171	0.168	0.127	0.142	0.140	0.053	0.088	0.085	0.300	0.297	0.297
N	160	160	160	157	157	157	153	153	153	152	152	152

Notes: This table presents the results of the OLS regressions of board structure and firm performance. ExeBoard represents the number of executive board members. SupBoard represents the number of supervisory board members. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Table 15: Robustness test with other ownership variables

	ROA		ROE		Tobin's Q		RET	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
OwnCon5	0.001**		0.002		-0.003		0.001	
	(2.122)		(1.327)		(-0.819)		(0.734)	
OutsiderOwn		0.109**		0.182		-.953**		-0.133
		(2.186)		(0.978)		(-1.982)		(-0.938)
LnAssets	0.023***	0.021***	0.060***	0.064***	-0.080*	-0.102**	0.023**	0.013
	(5.236)	(4.729)	(3.764)	(3.744)	(-1.946)	(-2.356)	(2.270)	(1.224)
LnAge	0.031***	0.029***	0.109***	0.112***	-0.011	0.024	0.035	0.035
	(3.080)	(2.795)	(2.989)	(2.847)	(-0.107)	(0.236)	(2.270)	(1.391)
Leverage	0.010	0.053	0.085	0.084	-0.910*	-0.751	-0.152	-0.193
	(0.193)	(0.924)	(0.414)	(0.373)	(-1.750)	(-1.349)	(-1.188)	(-1.403)
Constant	-0.440***	-0.488***	-1.370***	-1.422***	3.104***	3.515***	-0.197	0.024
	(-5.701)	(-5.712)	(-4.916)	(-4.868)	(4.179)	(4.635)	(-1.078)	(0.128)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.180	0.178	0.134	0.136	0.056	0.082	0.297	0.282
N	160	144	157	157	153	153	152	152

Notes: This table presents the results of the OLS regressions of ownership structure and firm performance using alternative measures. OwnCon5 represents the percentage of shares held by the five largest shareholders. OutsiderOwn represents the shares held by outsiders. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Appendix F – Robustness test, ownership identity types

Table 16: Robustness test, relation between accounting-based measures and the different ownership identity types

	ROA (t+1)					ROE (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
FamOwn	0.166***						0.423*			
	(2.583)						(1.825)			
ManOwn		-0.063						-0.108		
		(-1.362)						(-0.655)		
InsOwn			-0.009						-0.004	
			(-0.157)						(-0.018)	
CorpOwn				0.159***						0.171
				(2.727)						(0.804)
BankOwn					0.086					0.144
					(0.424)					(0.158)
LnAssets	0.021***	0.018***	0.019***	0.021***	0.019***	0.058***	0.051***	0.052***	0.054***	0.051***
	(5.214)	(4.522)	(-0.157)	(5.187)	(0.424)	(3.837)	(3.397)	(3.460)	(3.597)	(3.208)
LnAge	0.034***	0.032***	0.031***	0.033***	0.031***	0.116***	0.109***	0.108***	0.111***	0.108***
	(0.034)	(3.099)	(3.021)	(3.310)	(3.014)	(3.164)	(2.971)	(2.931)	(3.597)	(2.941)
Leverage	0.006	0.020	0.011	0.017	0.014	0.071	0.113	0.097	0.098	0.100
	(0.117)	(0.361)	(0.194)	(0.317)	(0.247)	(0.349)	(0.543)	(0.464)	(0.475)	(0.482)
Constant	-0.400***	-0.344***	-0.350***	-0.398***	0.014	-1.292***	-1.156***	-1.169***	-1.219***	-1.163***
	(-5.936)	(-5.199)	(-5.045)	(-5.954)	(0.247)	(-5.325)	(-4.886)	(-4.736)	(-5.014)	(-4.842)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.191	0.166	0.156	0.195	0.156	0.143	0.126	0.124	0.128	0.124
N	160	160	160	160	160	157	157	157	157	157

Notes: This table presents the results of the OLS regressions of ownership structure and firm performance using alternative measures. FamOwn, ManOwn, InsOwn, CorpOwn, BankOwn represents family ownership, managerial ownership, institutional ownership, corporate ownership and bank ownership, respectively. Missing ownership values are replaced by zeros. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Table 17: Robustness test, relation between market-based/hybrid measures and the different ownership identity types

	Tobin's Q (t+1)					RET (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
FamOwn	-0.124					0.224				
	(-0.202)					(1.487)				
ManOwn		0.073					0.011			
		(0.167)					(0.097)			
InsOwn			-0.443					-0.103		
			(-0.865)					(-0.814)		
CorpOwn				-0.499					-0.004	
				(-0.896)					(-0.028)	
BankOwn					3.937**					0.502
					(2.072)					(1.064)
LnAssets	-0.069*	-0.067*	-0.073*	-0.073*	-0.099**	0.023**	0.020**	0.019**	0.020**	0.016*
	(-1.772)	(-1.730)	(-1.884)	(-1.878)	(-2.424)	(2.403)	(2.143)	(1.982)	(2.118)	(1.618)
LnAge	-0.012	-0.010	-0.002	-0.017	-0.018	0.039	0.035	0.036	0.035	0.034
	(-0.118)	(0.105)	(-0.023)	(-0.175)	(-0.187)	(1.606)	(1.416)	(1.489)	(1.418)	(1.384)
Leverage	-0.905*	-0.917*	-0.969*	-0.929*	-0.814	-0.158	-0.154	-0.167	-0.152	-0.140
	(-1.735)	(-1.751)	(-1.848)	(-1.786)	(-1.578)	(-1.241)	(-1.187)	(-1.293)	(-1.184)	(-1.091)
Constant	2.814***	2.769***	2.949***	2.921***	3.033***	-0.193	-0.127	-0.084	-0.125	-0.093
	(4.305)	(4.393)	(4.487)	(4.517)	(4.805)	(-1.203)	(-0.815)	(-0.514)	(-0.777)	(-0.590)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.052	0.052	0.057	0.057	0.079	0.305	0.294	0.297	0.294	0.300
N	153	153	153	153	153	152	152	152	152	152

Notes: This table presents the results of the OLS regressions of ownership structure and firm performance using alternative measures. FamOwn, ManOwn, InsOwn, CorpOwn, BankOwn represents family ownership, managerial ownership, institutional ownership, corporate ownership and bank ownership, respectively. Missing ownership values are replaced by zeros. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Appendix G – Robustness test, executive compensation components

Table 18: Robustness test including the different components of executive compensation

	ROA (t+1)					Tobin's Q (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
LnBasesalary	-0.011					0.155				
	(-0.692)					(1.032)				
LnBonus		0.017					0.172*			
		(1.341)					(1.660)			
LnOther			0.001					0.070		
			(0.053)					(0.580)		
LnShareBased				0.001					0.095	
				(0.067)					(1.272)	
LnPension					0.005					0.185*
					(0.505)					(1.886)
LnAssets	0.023***	0.010	0.022**	0.018**	0.013**	-0.121**	-0.061	-0.057	-0.169***	-0.068
	(3.515)	(1.251)	(2.584)	(2.539)	(2.301)	(-2.014)	(-0.974)	(-0.839)	(-2.657)	(-1.222)
LnAge	0.030***	0.029***	0.028*	0.033**	0.030***	0.000	0.049	-0.004	0.075	-0.022
	(2.880)	(2.720)	(1.789)	(2.280)	(2.876)	(-0.004)	(0.544)	(-0.034)	(0.592)	(-0.217)
Leverage	0.009	0.017	-0.017	0.085	0.001	-0.912*	-0.795	-1.219**	-1.491	-1.446***
	(0.166)	(0.263)	(-0.202)	(1.071))	(0.025)	(1.730)	(-1.458)	(-1.844)	(-2.115)	(-2.574)
Constant	-0.316***	-0.314***	-0.372***	-0.394***	-0.285***	2.456***	1.370**	2.229***	3.972***	2.410***
	(-3.803)	(-4.063)	(-3.487)	(-4.006)	(-4.030)	(3.134)	(2.169)	(2.678)	(4.579)	(3.538)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.151	0.111	0.113	0.143	0.103	0.059	0.019	0.016	0.122	0.078
N	157	130	71	89	137	150	125	68	88	137

*Notes: This table presents the results of the OLS regressions of executive compensation components and firm performance. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.*

Appendix H – Robustness test, alternative performance measures

Table 19: Robustness test with alternative accounting-based dependent variables

	ROAnet_ic (t+1)					ROEop_ic (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
BoardSize	-0.007					-0.038*				
	(-1.104)					(-1.944)				
OutDir		-0.072					-0.116			
		(-0.713)					(-0.344)			
OwnCon			0.078*					0.202		
			(1.717)					(1.283)		
InsiderOwn				-0.036					-0.159	
				(-0.819)					(-1.237)	
LnTotComp					-0.007					-0.023***
					(-0.493)					(-4.709)
LnAssets	0.025***	0.020***	0.021***	0.018***	0.023***	0.087***	0.057***	0.059***	0.043***	0.067***
	(3.839)	(4.619)	(5.013)	(3.601)	(2.959)	(4.027)	(3.808)	(4.035)	(2.830)	(2.554)
LnAge	0.026**	0.027**	0.031***	0.021	0.026**	0.102***	0.109***	0.109***	0.047	0.105***
	(2.434)	(2.543)	(3.022)	(1.550)	(2.406)	(2.868)	(3.063)	(3.075)	(1.168)	(2.900)
Leverage	0.017	0.014	0.010	-0.065	0.017	0.162	0.157	0.154	0.019	0.164
	(0.298)	(0.242)	(0.179)	(-0.933)	(0.286)	(0.820)	(0.780)	(0.774)	(0.089)	(0.807)
Constant	-0.369***	-0.311***	-0.390***	-0.225***	-0.340***	-1.318***	-1.155***	-1.319***	-0.635**	-1.188***
	(-5.219)	(-3.434)	(-5.642)	(-2.651)	(-4.431)	(-5.705)	(-3.856)	(-5.508)	(-2.556)	(-4.709)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.147	0.143	0.159	0.109	0.143	0.158	0.137	0.146	0.066	0.140
N	160	160	160	92	158	157	157	157	90	155

*Notes: This table presents the results of the OLS regressions of the corporate governance variables with an alternative accounting-based measures of firm performance; ROA based on net income and ROE based on operating income. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.*

Table 20: Robustness test with an alternative market-based dependent variable

	MBV (t+1)				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
BoardSize	0.281*				
	(1.771)				
OutDir		1.492			
		(0.553)			
OwnCon			-3.325***		
			(-2.703)		
InsiderOwn				-0.028	
				(-0.021)	
LnTotComp					1.018***
					(2.678)
LnAssets	-0.393**	-0.177	-0.222**	-0.214	-0.609***
	(-2.286)	(-1.523)	(-1.972)	(-1.425)	(-3.038)
LnAge	-0.030	-0.081	-0.072	-0.702*	0.030
	(-0.104)	(-0.280)	(-0.253)	(-1.703)	(0.103)
Leverage	1.145	1.184	1.190	-0.838	1.674
	(0.756)	(0.772)	(0.796)	(-0.400)	(1.097)
Constant	5.317***	3.804	6.279***	7.698***	2.437
	(2.851)	(1.581)	(3.306)	(3.021)	(1.216)
IND	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.024	0.005	0.052	0.026	0.045
N	153	153	153	90	151

Notes: This table presents the results of the OLS regressions of the corporate governance variables with an alternative market-based measure of firm performance; Market-to-book value. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Appendix I – Robustness test, alternative control variables

Table 21: Robustness test with alternative control variables

	ROA (t+1)					Tobin's Q (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
BoardSize	-0.010*					0.079*				
	(-1.949)					(1.919)				
OutDir		-0.040					0.230			
		(-0.428)					(0.297)			
OwnCon			0.090**					-0.640*		
			(2.107)					(-1.816)		
InsiderOwn				-0.033					-0.343	
				(-0.716)					(-0.945)	
LnTotComp					-0.022*					0.385***
					(-1.767)					(3.806)
LnSales	0.029***	0.023***	0.024***	0.021***	0.032***	-0.145***	-0.091***	-0.103***	-0.100***	-0.243***
	(5.829)	(6.087)	(6.575)	(4.473)	(5.215)	(-3.478)	(-2.937)	(-3.346)	(2.730)	(-4.930)
LnAge	0.019*	0.021**	0.021**	0.019	0.017*	(0.105)	0.088	0.090	-0.004	0.156*
	(1.923)	(2.100)	(2.106)	(1.227)	(1.661)	1.239	(1.032)	(1.073)	(-0.036)	(1.882)
LTD Leverage	-0.015	-0.036	-0.035	-0.044	-0.015	0.603	0.772	0.758	0.133	0.640
	(-0.252)	(-0.580)	(-0.580)	(-0.557)	(-0.244)	(1.190)	(1.515)	(1.523)	(0.213)	(1.300)
Constant	-0.380***	-0.347***	-0.420***	-0.298***	-0.328***	1.761***	1.562***	2.055***	2.271***	0.715
	(-6.403)	(-4.452)	(6.588)	(-3.436)	(4.733)	(3.559)	(2.398)	(3.847)	(3.338)	(1.275)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.267	0.246	0.270	0.190	0.271	0.095	0.068	0.092	0.073	0.163
N	139	139	139	77	137	133	133	133	76	131

*Notes: This table presents the results of the OLS regressions of the corporate governance variables with firm performance, using the natural logarithm of annual sales as size control variable and leverage based on long-term debt as capital structure control variable. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.*

Appendix J – Robustness test, regressions without lagged variables

Table 22: Robustness test, relation between all corporate governance variables and firm performance without lagged variables

	ROA					Tobin's Q				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
BoardSize	-0.011**					0.084				
	(-2.201)					(1.152)				
Outside Directors		-0.081					0.571			
		(-0.908)					(0.459)			
OwnCon			0.064					-0.010*		
			(1.564)					(-1.762)		
Insider Ownership				-0.037					0.817	
				(-0.848)					(1.377)	
LnTotComp					0.007					0.109
					(0.718)					(0.821)
LnAssets	(0.030***	0.021***	0.021***	0.021***	0.017***	-0.139*	-0.076	-0.088*	-0.074	-0.121
	(5.152)	(5.404)	(5.570)	(4.241)	(2.208)	(-1.767)	(-1.431)	(-1.683)	(-1.096)	(-1.506)
LnAge	0.018*	0.020**	0.020**	0.027*	0.021**	-0.057	-0.072	-0.068	-0.246	-0.057
	(1.907)	(2.115)	(2.122)	(1.952)	(2.208)	(-0.428)	(-0.542)	(-0.515)	(-1.331)	(-0.429)
Leverage	-0.106**	-0.108**	-0.106**	-0.157**	-0.103**	-1.288*	-1.272**	-1.256*	-2.641***	-1.263**
	(-2.179)	(-2.168)	(-2.149)	(-2.222)	(-2.080)	(-1.847)	(-1.814)	(-1.812)	(-2.781)	(-1.805)
Constant	-0.278***	-0.199**	-0.279***	-0.239***	-0.258***	3.129***	2.605**	3.402***	3.644***	2.734***
	(-4.500)	(-2.489)	(-4.358)	(-2.788)	(-4.096)	(3.633)	(2.358)	(3.864)	(3.186)	(3.110)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.201	0.179	0.188	0.211	0.147	0.063	0.056	0.075	0.126	0.059
N	159	159	159	92	159	152	152	152	89	152

Notes: This table presents the results of the OLS regressions of the corporate governance variables with firm performance. In this model, no lagged variables are used. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.

Appendix K – Robustness test, year subsample

Table 23: Robustness test by the year 2017

	ROA (t+1)					Tobin's Q (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
BoardSize	-0.013*					0.084				
	(-1.630)					(1.337)				
OutDir		-0.111					0.594			
		(-0.793)					(0.550)			
OwnCon			0.102					-0.175		
			(1.559)					(-0.343)		
InsiderOwn				-0.009					0.669	
				(-0.146)					(1.314)	
LnTotComp					-0.017					0.189
					(-0.877)					(3.803)
LnAssets	0.032***	0.023***	0.024***	0.024***	0.030***	-0.169***	-0.112**	-0.109**	-0.120**	-0.196**
	(3.840)	(3.920)	(4.123)	(3.515)	(2.825)	(-2.634)	(-2.471)	(-2.425)	(-2.076)	(-2.417)
LnAge	0.027*	0.030**	0.032**	0.017	0.028*	-0.024	-0.040	-0.043	-0.209	-0.018
	(1.894)	(2.057)	(2.188)	(0.936)	(1.892)	(-0.213)	(-0.358)	(-0.383)	(-1.324)	(-0.159)
Leverage	0.065	0.065	0.069	-0.070	0.062	-1.013*	-1.048*	-1.067*	-1.894**	-0.990*
	(0.877)	(0.867)	(0.934)	(-0.794)	(0.819)	(-1.835)	(-1.824)	(-1.859)	(-2.536)	(-1.716)
Constant	-0.451***	-0.367***	-0.493***	-0.312***	-0.403***	3.449***	2.980***	3.426***	4.139***	3.000***
	(-4.667)	(-2.913)	(-4.739)	(-2.524)	(-3.890)	(4.631)	(3.082)	(4.230)	(3.946)	(3.803)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.183	0.161	0.180	0.121	0.163	0.112	0.096	0.093	0.186	0.107
N	87	87	87	56	86	87	87	87	56	86

*Notes: This table presents the results of the OLS regressions of the corporate governance variables with firm performance. In this model, only data from 2017 is used. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.*

Table 24: Robustness test by the year 2012

	ROA (t+1)					Tobin's Q (t+1)				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
BoardSize	-0.005					0.175**				
	(-0.620)					(1.740)				
OutDir		-0.009					0.512			
		(-0.070)					(0.310)			
OwnCon			0.044					-1.406*		
			(0.629)					(-1.848)		
InsiderOwn				-0.054					-0.410	
				(-0.750)					(-0.446)	
LnTotComp					0.004					0.654**
					(0.169)					(2.464)
LnAssets	0.020**	0.016**	0.019***	0.006	0.014	-0.177	-0.020	-0.043	-0.045	-0.270**
	(2.145)	(2.581)	(2.869)	(0.844)	(1.346)	(-1.493)	(-0.262)	(-0.581)	(-0.442)	(-2.148)
LnAge	0.034**	0.036**	0.027	0.041*	0.036**	0.078	0.034	0.087	(-0.124	0.090
	(2.310)	(2.399)	(2.869)	(1.931)	(2.379)	(0.413)	(0.178)	(0.460)	(-0.446)	(0.483)
Leverage	-0.055	-0.056	-0.078	-0.045	-0.054	-0.788	-0.763	-0.698	-1.640	-0.532
	(-0.649)	(-0.655)	(-0.836)	(-0.344)	(-0.627)	(-0.748)	(-0.705)	(-0.664)	(-0.914)	(-0.507)
Constant	-0.284***	-0.261**	-0.285***	-0.139	-0.277**	2.649**	1.753	2.567**	3.312**	0.273
	(-3.169)	(-2.267)	(-2.906)	(-1.228)	(-2.628)	(2.438)	(1.233)	(2.412)	(2.279)	(0.218)
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.129	0.123	0.115	0.038	0.119	0.017	-0.033	0.024	-0.097	0.058
N	73	73	73	36	72	66	66	66	35	65

Notes: This table presents the results of the OLS regressions of the corporate governance variables with firm performance. In this model, only data from 2012 is used. Unstandardized coefficients are reported. The figures in parentheses represent the t-statistics. * Indicates significance is at the 10% level, ** Indicates significance at the 5% level, *** Indicates significance at the 1% level.