

The effect of Dual Share Structure on firm performance for publicly traded companies in the United States

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Abstract

This paper examines the effect of a company having a dual share structure (DSS) on the firm performance. This research uses a sample consisting of U.S. publicly traded companies to test the effect of dual shares on ROA, the natural logarithm of Tobin's Q and labour productivity. A dataset with 79,367 firm years from 1998 till 2017 is established; within this dataset a matched sample is created with 13,580 matched dual share and single share company years. This study finds a causal negative relationship between dual shares and firm performance. Other findings include that the benefits of dual share companies erode over time, suggesting that the maturity of a company has a negative effect on the firm performance of a dual share company. Furthermore, increasing executive compensation and extra members on the board of directors in interaction with dual shares have a negative impact on a firms' Tobin's Q. The results described in this thesis are found using both Propensity Score Matching and multivariate OLS regressions analyses with interaction terms. This study contributes to the contradicting corporate governance literature that extensively examined the impact of dual shares on firm performance.

Key words:

Dual Share Structure, Concentrated Control, Corporate Governance Mechanisms

JEL Classification:

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CHAPTER 1: Introduction

The most essential contractual right that shareholders possess is believed to be their right to vote on important corporate matters (Burkart & Lee, 2008). This right can be equally divided among shareholders according to the capital the shareholders supply, this is called “one share- one vote” and is the most common structure used. However, this structure is often replaced by more complicated structures; incorporating concentrated control and unequal voting rights. Such as dual-share structure (henceforth: DSS). A firm possesses a dual-share structure when it issues more than one class of shares and at least one of these classes of shares has unequal voting rights, these shares are usually divided in superior shares (shares with more proportionally more voting rights) and common shares (Adhikari, Nguyen & Sutton; 2018). Traditionally, the insiders (executives) of the company own the superior shares and these insiders have relatively higher voting rights than the outside shareholders possessing the common shares, when they possess the same cash flow rights.

There is a considerable rise of the usage of dual share structures when going public with a company. For example, a large group of well-known U.S. public companies have adopted their share structure to dual share structure; including CBS, Comcast, Ford, Google, News Corp and Nike (Bebchuk & Kastiel, 2017). Furthermore, when Google went public in 2004 with a dual-class structure, a lot of leading tech companies followed. Examples are: Facebook, Groupon, LinkedIn, Snap, Tripadvisor and Zynga. Almost one-fifth of the firms that went public in 2017 have dual-share structures with unequal voting rights, according to the Council of Institutional Investors (Bloomberg, 2018). An extreme example is the Photo-sharing app Snap Inc., they handed zero percent of the voting rights to their shareholders in its \$3.4 billion IPO in 2017 and the founders received all the voting rights of Snapchat for the rest of their lives (Bloomberg, 2019). Snap Inc. entered the stock market at 24\$ a share opening price and the company priced its' IPO at 17\$ a share (CNBC, 2017).

Dual share structures have received much attention in the past centuries, mainly because of the contradicting researches about the effect of DSS on total shareholder value. The leading theories of the effect of dual share structure on firm performance are the agency theory and the stewardship theory. The agency theory builds upon the costs associated with the split between ownership and control, costs rising when managers

misuse corporate funds to extract private benefits (Jensen & Meckling, 1976). The agency theory predicts a negative relationship between dual share structure and firm performance. Agency costs play a role in every company. However, the impact is even greater for dual class companies due to their controlling shareholders holding smaller equity positions than their voting positions (Amoako-Adu et al., 2011). The stewardship theory is the counterpart theory of the agency theory and predicts a positive influence of dual share structure on firm performance. The stewardship theory is built upon the view that managers act as stewards for their principals with aligned motives, instead of acting out of individual motives (Davis et al., 1997). Therefore, the split between ownership and control could positively impact the firm performance. Other main theoretical predictions predicting a positive influence of DSS on firm performance are i) the focus of a company on the long term instead of the short term, ii) fast growing firms get the opportunity to grow and invest in significant R&D costs without being forced out by the other shareholders, iii) DSS is able to protect companies from the normal market pressures and therefore almost immune to a hostile take-over and iv) lastly if the founder is a unique fit for the company, this person is more able to make the right decisions.

Despite the possible shortcomings of DSS, it is not clear why dual share structures are favourable over the past years. Several theories examine the positive and negative influence of dual share structures. However, literature is contracting about the effect of DSS and the characteristics of dual share structures are not well understood. Based on the literature review in chapter 2, the majority of the researches in the past find evidence for a negative relationship of dual shares on firm performance, then again most of these researches are out-dated.

This paper adds value to this discussion by addressing the reasons why firms increasingly adopt dual share structure and investigates the relationship of dual share structure on total shareholder value for the past few years. That is why the main research question will be:

What is the effect of dual share structures of public companies on firm performance in the United States?

In order to answer and better understand the main research question, some additional insights are addressed. This paper contributes to the existing literature by examining the relationship of the maturity of a company, growth opportunities and R&D expenses over sales within a dual share structure on firm performance. Another contribution to the literature is the introduction of interaction terms with dual share structure and several corporate governance mechanisms. DSS is an ownership structure and ownership structures together with other corporate governance mechanisms are perceived to have an influence on firm value (Nini, Smith & Sufi; 2009). That is why the effect of some corporate governance mechanisms (cash, capital expenditures, executive compensation, outsiders on the board and board size) will be tested in interaction with DSS.

This thesis uses a comprehensive dataset on dual share class companies from 1998-2017. In order to identify dual share companies, the methodology was inspired by Gompers, Ishii & Metrick (2009). The effect of dual share structures on firm performance is tested, by conducting multiple multivariate OLS regressions including interaction terms. This paper makes use of two samples, a full sample and matched sample. Propensity Score Matching (PSM) creates the matched sample. PSM is used because firms do not randomly choose to adopt dual share structure, as dual share structure could be endogenous to certain elements within the firm.

When measuring firm performance using ROA, this study confirms the statistically significant negative causal relationship between dual shares and firm performance. Further analyses found statistically significant evidence for a negative relationship between dual shares and the maturity of a company on firm performance, suggesting that the benefits of DSS erode over time. Furthermore, the corporate governance mechanisms executive compensation and the size of the board have a statistically significant negative relationship on Tobin's Q for dual share companies. The analysis did not reveal any significant relationships between growth opportunities, cash, capital expenditures and more outsiders on the board on firm performance for dual share companies.

This paper continues as following. First, in chapter 2 the theoretical framework will be presented. The subjects consist of the explanation of shareholder rights, dual shares, the benefits and costs of dual shares and the governance mechanisms in relation to concentrated control. Based on the literature review, in this chapter 9 hypotheses are

formulated, which will be tested in the thesis onwards. Chapter 3 examines the data of this research, focusing on how to identify dual share companies, the creation of the sample and the descriptive statistics. The methodology, empirical methods and the empirical framework are discussed in chapter 4. Chapter 5 provides an overview of the results and finishes up with some robustness checks to validate the suggested results. Finally, in chapter 6 the conclusions are drawn. Next to that, this section describes the limitations and suggests some ideas for further research.

CHAPTER 2: Literature review

In order to gain a better understanding of the subject, previous literature will be examined. Throughout this paper, the terms dual share structure, dual shares, DSS and DSC will be used interchangeably. First, it will be explained what shareholder rights are and what different kind of shareholder rights exist. Then DSS will be explained and how this ownership structure works. Third, insights will be provided as to why DSS exists and what the benefits and costs are of this structure. Fourth, the link between governance mechanisms and concentrated control will be described.

2.1. Shareholder rights

Shareholders of publicly traded firms possess two common rights, voting rights and cash flow rights. Shareholder voting rights give the shareholder the right to appoint members of the board, to authorize or to block mergers and acquisitions, approve equity issues and to decide on all other important corporate matters of the company (Yermack, 2010). In many companies, the management team of the company additionally possesses these rights.

In the “one-share one-vote” structure the voting rights are divided equally between all the shareholders, although it could be costly for the firm. Shareholders do not possess the same insider information as the management team about the company and therefore their voting decisions could differ from the superior decisions made by management (Yermack, 2010).

2.1.1. Separation voting rights and cash flow rights

Ownership of equity possess two rights, the right to vote on corporate matters as a way of corporate governance (voting rights) and the right to obtain capital gains, dividends and any form of cash flow distribution from the company (cash flow rights) (Yermack, 2010). It is quite difficult to assess these two rights separately from each other in terms of value (Kahan & Rock, 2008).

The market value of a company could be retrieved from the exchange on which the company is listed. How to determine the value of voting rights, on the other hand, has been and still is an unanswered question (Yermack, 2010). If the voting rights could be assessed by value, corporate governance could be valued. Most researchers conclude that the value of the voting rights is relatively small, when the company is performing under average performance levels (Yermack, 2010; Grossman & Hart, 1988; Burkart & Lee, 2008).

Voting rights become more valuable whenever there is a disparity between voting rights and cash flow rights. This is the case when the company offers shares with different voting rights. In this case the company is a dual share company, this effect has been extensively researched. On average the superior shares with higher voting power have a positive and significant premium, companies that choose to structure their firm with dual class shares may have the most beneficial voting rights (Kalay & Pant, 2009).

2.1.2. Corporate elections

All public companies are required to schedule (annual) shareholder meetings. In these meetings corporate matters will be discussed among the shareholders and all the shareholders can vote on these decisions. The votes serve as a purpose of communication between the shareholders, management and the board of directors. These meetings consist of a predetermined agenda, which is most of the time set by management but could also be petitioned by the shareholders.

A frequently discussed topic in the meetings is the election of directors. Shareholders are able to vote in favour of or against a director. In this way the shareholders make sure that they agree on the directors representing their rights. Nonetheless, in practice it rarely happens that a director will be removed of the board by the shareholders (Yermack, 2010). In the United States the director elections are rather a formality. Directors generally elect themselves, with no other contestants, that

is why shareholders most of the time do not have another choice than accepting the director (Becker & Guhan Subraminian; 2013). Likewise, SEC chairman Arthur Levitt, JR. famously quoted: “A director has a better chance of being struck by lightning than losing an election” (Becker & Guhan Subraminian; 2013).

What’s more, there are a lot of corporate matters on which could be asked in the shareholder meeting to vote upon. To give an illustration which matters this could be, corporate matters could be the issuance of additional equity, the approval of a new outside auditor, mergers and acquisitions, changes in the corporate by-laws and voting on the executive compensation package (Yermarck, 2010). The matters could be at times urgent, such as a major merger or acquisition and then an additional shareholder meeting could be planned. The shareholder voting process consists of the same standard structure at almost all companies. While all shareholders could be present at the annual meeting, the majority of shareholders votes by proxy, through e-mail or via the internet (Kahan & Rock, 2008).

A corporate governance issue that is often discussed and should be voted upon is executive compensation. Shareholders own the right to vote on executive compensation related decisions, consequently they are able to influence the compensation of management directly (Yermack, 2010). The shareholders often find the executive compensation too high. They are allowed to vote on the total compensation package of the executives, often on debatable compensation conditions. These debatable compensation conditions, for instance, are golden parachutes or stock option repricing (Cai et al., 2009). These shareholders’ votes have proven to be powerful. Different researchers found evidence for the effectiveness of shareholders’ votes on executive compensation. One of these researchers is Gillian (2001), and according to Gillian (2001) the shareholders voting against a proposed executive compensation grew from 3% in 1988 to roughly 19% in 1996.

2.2. Dual-class shares explained

A firm contains a dual-share structure when it issues more than one class of shares. Dual-class shares are different classes of shares with unequal voting rights (Adhikari, Nguyen, Sutton; 2018). A common dual-class share company has a publicly traded “inferior” class of stock with one vote per share (from now on “ordinary shares”) and a

non-publicly traded “superior” class of stock with ten votes per share (from now on “superior shares”) (Gompers; Ishii & Metrick, 2009).

The superior shares are usually owned by insiders of the firm and cause a significant wedge between their voting and cash flow rights. Therefore, the insiders have a large percentage of votes with a small percentage of equity. It is common in DSS that insiders have less than half of the cash-flows rights but more than half of the voting rights, this is the case in almost 40% of the dual-class firms (Gompers; Ishii & Metrick, 2009). The ordinary shares are mainly owned by outside investors (Chemmanur & Jiao, 2011).

The wedge between superior shares and ordinary shares can be manifested in two different ways, voting control and board control. Voting control is the most prevailing usage for dual share companies and means that there is a wedge between voting and cash flow rights for the superior shares. Board control is a form of voting control and means that the superior shareholders have more power than the ordinary shareholders to elect the board (Dey, Nikoleav & Wang; 2015).

DSS is mainly beneficial for founders and owners, as DSS enables them to develop the company without too much interference by the rest of their investors (Nüesch, 2016). Dual-class shares are therefore mostly beneficial for insiders, however it could also be beneficial for the outsiders if it means that total firm value will be maximized.

There are dual share companies that change their structure from a dual class share structure to a single share structure, which is called unification. The firm then unifies their disparate shares to one single class of shares again (Pajuste, 2005). Unification could be done by a sunset provision. A sunset provision is a threshold event that immediately triggers the termination of the dual class structure (Kim & Michaely, 2018). Examples of a sunset provision could be a predetermined time period since the IPO, the retirement of the founder or controller or allow the common shareholders to decide on unifications every couple of years (Kim & Michaely, 2018). Some sunset provisions are proven really effective and others are proven to be ineffective and weak because in real life these sunset provisions are unlikely to be triggered. Therefore, the sunset provisions should be chosen critically.

2.3. Dual Share Companies: Benefits and Costs

2.3.1. Benefits of DSS

There are different reasons why a firm chooses to structure their firm with dual shares, this is not a random choice for a firm. The most important reasons and benefits are highlighted.

One of the benefits of having dual shares is the founder or controller of the company having superior leadership skills and that he/she is able to lead the company in a way no one else will. This could be because of certain skills, abilities and vision this person possesses, making the founder or controller a unique fit for the company (Bebchuck & Kastiel, 2017). DSS allows high ability managers then to create value for the firm by investing in risky, long-term projects (Jordan, Kim & Liu; 2016). Firms with excellent managers appear to adopt DSS. Examples are Google, Berkshire Hathaway and the New York Times which have managers proven beneficial for these companies (Chemmanur & Jiao, 2011).

Second, dual shares insulate management from short-term market pressures. The company is then able to focus more on the long-term goals over the short-term goals (Bebchuck & Kastiel, 2017). Owners do not have to worry to be forced out by outside shareholders. Furthermore, financial markets may not recognize these long-term investments and therefore the shares of the company could be undervalued (Nüesch, 2016). Adhikari et al (2018) find that dual-class acquirers outperform single-class acquirers in the long run, therefore dual-class structures can be desirable for long-term value creation.

DSS might be especially beneficial for high growth firms due to their long-term focus. High-growth firms with long-term projects that require significant upfront costs may find DSS optimal to adopt because managers can focus on creating long-term value for shareholders instead of distressing about short-term market pressures (Jordan, Kim & Liu; 2016).

Next to that, fast growing firms that need external finance to fund their projects benefit from adopting dual-shares because this promotes stable ownership and firm specific investments (Nüesch, 2016). Nüesch (2016) finds evidence that dual-class share companies perform better than their matched single share companies when the company needs external finance.

Lastly, one of the biggest benefits for a company to adopt dual share structure is that it can protect companies from the normal capital market pressures (Kim & Michaely, 2018). The financial markets can be myopic sometimes (Nüesch, 2016). The market forces are less severe for these dual class companies because the insiders possess (most of the time) the majority of the voting rights. One of the biggest examples of this insulation from the “normal market forces” is that dual share companies are closely to immune to a hostile take-over (Gompers; Ishii; Metrick, 2009). That is why dual-class shares are described as one of the most effective example of an anti-takeover provision and are proven effective to hostile takeovers (Pajuste, 2005).

Furthermore, the overall positive view of dual-class shares has its origin in the stewardship theory (Davis et al., 1997). The stewardship theory is built upon the view that managers act as stewards with aligned motives of their principals, instead of acting out of individual motives (Davis et al., 1997). According to this theory, the wedge between the managers and shareholders is not harmful, oppositely it is actually good for the firm because it could force the managers and the otherwise controlling shareholders to maintain their focus on the total shareholder value (Nüesch, 2016).

The benefits of adopting DSS can be summarized as following i) the founder or owner is a unique fit, this person can make decisions he or she could not make if the outside shareholders would try to block these decisions, ii) the owners could focus on the long term goals instead of the short term goals, iii) fast growing firms get the opportunity to grow and invest in significant R&D costs without being forced out, iv) external finance is easier for a DSS company because it promotes stability and v) DSS is able to protect companies from the normal market pressures. Combining all these benefits together with the stewardship theory, hypothesis 1 is formulated:

H1: Firms with dual share structure have higher shareholder value than (their matched) single class share structure firms

2.3.2. Costs of DSS

The costs of dual share structure mainly consist of agency costs. The agency theory is the counterpart theory of the stewardship theory. Agency costs are the costs associated with the split between ownership and control and these costs are widely recognized in corporate governance literature (Nüesch, 2016; Jensen & Meckling, 1976). Agency costs

are the costs that arise when managers will misuse corporate funds to extract private benefits (Jensen & Meckling, 1976). The impact of agency costs is even greater for dual class companies due to their controlling shareholders holding smaller equity positions than their voting positions (Amoako-Adu et al., 2011).

Agency costs vary across DSS companies, dependent on the way ownership and control is separated. These agency costs could arise due to excessive use of the dual share structure by the companies' controllers (Bebchuck and Zingales, 2000). If the companies' controllers have more voting rights than cash flow rights, this could mean that these insiders have less financial consequences for the decisions they execute. These lower financial consequences could lead to higher incentives for these superior shareholders to obtain private benefits (Nüesch, 2016).

The agency costs tend to be smaller for young dual share companies, because young companies have strong incentives to maximize shareholder value. Their benefits depend more on future shareholder value than on the private benefits in the present (Kim & Michaely, 2018). This leads to an increase in agency costs when the firm matures because then the payoff of the managers does depend on the present benefits instead of the future firm value (Kim & Michaely, 2018).

Masulis, Wang & Xie (2009) studied these agency problems in dual share companies. They found four different ways in which these agency costs manifest in a dual share company and how the outside investors are affected by this "uncommon" share structure. Corporate cash holdings, executive compensation, corporate acquisitions and capital expenditures are studied within dual share companies. They find that all of these have significant negative effect on shareholder value; this will be discussed in detail in section 2.4.

In conclusion, researchers define different costs associated with dual share structure. Grossman & Hart (1998) and Harris & Raviv (1988) are seminal papers in analysing the optimal framework of how a firm should structure their shares. They state that one-share one-vote is the optimal firm share structure because it diminishes the likelihood that a value decreasing action would happen due to the divergence in voting rights and cash flow rights of the insiders (Chemmanur & Jiao, 2011). An example could be intentionally blocking takeovers that would actually result in more shareholder value. Furthermore, most of the international evidence suggests that the excess of control rights against cash flow rights decreases the observed market value of firms

(Denis & McConnell, 2003). This suggests the opposite effect as proposed in Hypothesis 1, proposing the contradicting hypothesis. As such, hypothesis 2 is as follows:

H2: Firms with dual share structure have lower shareholder value than (their matched) single class share structure firms

2.3.3. Growth opportunities and the Maturity of the company

In the previous section the expected relationship between growth opportunities and the maturity of the company and dual share companies is introduced.

For companies with high growth opportunities it might be specifically favourable to adopt their share structure to dual share structure. First of all, it is easier to focus on the long-term future instead of the short-term future of the company. For instance, high-growth firms and firms with long-term projects that require significant upfront costs, such as high costs for research and development, may find DSS optimal to adopt. Managers in dual share companies can focus on creating long-term value for shareholders without worrying about short-term market pressures (Jordan, Kim & Liu; 2016). In single share companies the shareholders could force managers out when they are not performing according to their demands. Dual shares protect entrepreneurial management against the requests of ordinary shareholders, this also weakens the problem of underinvesting by managers (Adhikari et al., 2018). The following hypothesis will be tested:

H3: The combination of dual share structure and high growth opportunities leads to higher shareholder value than a single share structure company with high growth opportunities

As for the maturity of a company, the relationship of the age of a company in a dual share structured company is introduced in the costs section. The biggest costs of DSS are perceived to be agency costs.

Young fast-growing companies have stronger incentives to maximize their shareholder value. Their benefits depend more on future shareholder value than on the private benefits in the present (Kim & Michaely, 2018). Consequently, the agency costs tend to be less severe for young dual share companies. This leads to an increase in

agency costs when the firm matures because then the payoff of the managers does depend on the present benefits instead of the future shareholder value (Kim & Michaely, 2018). The benefits of possessing dual share structure seem to erode over time and the agency costs associated with dual share structure seem to increase over time. As such Hypothesis 4 is established:

H4: When a dual class company matures, the benefits of DSS erode and the agency costs increase, resulting in a lower shareholder value

2.4. Concentrated control and corporate governance mechanisms

It is frequently discussed in corporate governance literature that concentrated control and ownership structures have an impact on the firm value (Nini, Smith & Sufi, 2009). DSS is a different form of ownership structure than the common ownership structure; hence it is plausible that DSS has an influence on shareholder value. Furthermore, there are some corporate governance mechanisms that have an influence on total shareholder value and in this paper will be researched if these corporate governance mechanisms are stronger in combination with dual shares. Masulis, Wang & Xie (2009) found significant negative influence for cash, executive compensation, acquisitions and capital expenditures in combination with dual share status for total shareholder value. This research will focus on the effect of cash, executive compensation, capital expenditures, board size and outsiders in the board on total shareholder value. These governance mechanisms will either in combination with dual status be assessed as independently on total shareholder value.

2.4.1. Cash and capital expenditures as a corporate governance mechanism

Cash plays an important role in every company, especially combined with corporate governance. For multiple reasons cash is recognized as important; cash is easily available by management, companies hold significant amounts of cash, these corporate cash holdings represent a substantial part of the total shareholder value and there is large variation of cash holdings within companies over time (Ditmar & Mahrt-Smith, 2007).

Corporate cash holdings are essential when agency problems arise, because corporate cash holdings do not contain asymmetric information (Pawlina & Renneboog,

2005). When there is asymmetric information present, cash will strengthen shareholder value by easing the underinvestment problem when external financing is perceived to be costly by management. Masulis, Wang & Xie (2009) found evidence that cash is valued less to outside shareholders within dual share companies, by cause of a declining marginal value of corporate cash holdings in the divergence between insider voting rights and cash flow rights.

Good governance can improve overall firm value by controlling their excess cash holdings carefully and invest their cash knowingly. On the other hand, poorly governed companies could destroy firm value when their cash reserves are used for unprofitable investments (Dittmar & Mahrt-Smith, 2007). Corporate governance has a limited effect on how companies acquire their cash, but a substantial effect on how companies invest their cash (Dittmar & Mahrt-Smith, 2007).

Private benefits due to agency problems manifest mostly through empire building. Empire building demonstrates itself through unprofitable internal investments (Nüesch, 2016; Masulis, Wang & Xie; 2009). Unprofitable internal investments could be done with cash or capital expenditures, which could lead to lower shareholder value. In a dual share company cash is more accessible to management, because management possesses more voting rights. Hence, in a dual share company it is easier to decide on value-destroying cash investments. Based on the literature, hypothesis 5 is formulated:

H5: Within a dual share company, higher corporate cash holdings decrease the firm value more than within a (matched) single share company

Next to cash investments, capital expenditures are another approach for a manager to obtain private benefits through empire building. According to Masulis, Wang & Xie (2009) managers of dual share companies are susceptible to making value destroying capital expenditures, implying that these investments are benefiting them privately. Extracting private benefits as a manager in a dual share company has usually few (financial) consequences. Therefore, hypothesis 6 is stated:

H6: Within a dual share company, capital expenditure decisions are more likely to be value destroying than within a (matched) single share company

2.4.2. Executive compensation as a corporate governance mechanism

One of the fundamental issues of corporate governance is executive compensation. Through executive compensation wealth could be transferred from outside shareholders to the insiders of the company. Multiple researchers argue that insiders use their advantage in voting rights to affect the remuneration process, resulting in higher salaries for CEO's of dual share companies relative to single share companies (Masulis, Wang & Xie, 2009; Nüesch, 2016). The bigger the wedge between the insider voting rights and cash flow rights is, the bigger the difference in CEO salaries (Masulis, Wang & Xie, 2009; Nüesch, 2016).

Amoak-Adu et al. (2011) distinguish between two different theories on executive compensation, optimal contract theory and managerial power theory. Optimal contract theory states that managers are paid to incentivise their interests to the outside shareholders' interests. On the other hand, managerial power theory declares that when managers have power over their own remuneration contract, this could be a concern in a dual class company. According to Amoak-Adu et al. (2011), dual class companies are consistent with optimal contract theory, suggesting that higher executive compensation could align dual class managers with the interests of outside shareholders. Based on this finding, hypothesis 7 is defined as:

H7: Dual class companies with higher executive compensation have higher shareholder value than dual class companies with lower executive compensation

2.4.3. Board size and outsiders in the board as a corporate governance mechanism

Jensen (1993) researched the market for corporate control and the challenges for internal control mechanisms. The board of directors is one of these internal control mechanisms and an essential one, because these directors bear the end responsibility of the company (Jensen, 1993). The board of directors exists to represent the interests of shareholders, because the separation of ownership and control could lead to agency problems (Denis & McConell, 2003). The board of directors is a corporate governance mechanism to resolve the agency problems between management and shareholders (Hermalin & Weisbach, 1991). Their main tasks are hiring, firing, monitoring and compensating management, while doing this in the best interest of the shareholders (Denis & McConell, 2003).

In theory, the board of directors sounds effective, however in practice it has been proven to be less successful (Jensen, 1993; Denis & McConell, 2003; Mak & Kusnadi, 2005; Yermack, 1996). The person who should be monitored the most, the CEO, is often part of the board of directors and it is not even uncommon that the CEO is also the chairman of the board of directors (Denis & McConell, 2003). Next to that, the rest of the directors do not have to be independent either. Especially in the United States it is common that there are multiple insiders of the company on the board of directors. These insiders are less likely to argue with the CEO (Jensen, 1993).

Multiple papers find evidence for a negative relationship between board size and firm value (Jensen, 1993; Denis & McConell, 2003; Mak & Kusnadi, 2005; Yermack, 1996). Suggesting, the bigger the board is the lower the performance of the company is. The costs of a big board are mainly due to coordination and communication problems; these problems could lead to ineffective decision-making (Yermack, 1996). When boards get bigger, it becomes more difficult to effectively manage the CEO. Hence, the CEO is more likely to control the board (Jensen, 1993).

Coupled with dual share companies, the wedge between control and ownership is bigger and thus opens up more room for agency problems. In light of the potential agency problems the board of directors is even more important in a dual share company. Plus the CEO should be more monitored in a DSS company, to protect the rest of the outside shareholders. Yermack (1996) finds that small board of directors in the United States are more effective in controlling a company. Indicating more effectiveness of a smaller board in DSS companies, leads to hypothesis 8:

H8: Within a dual share company, an increasing size of the board of directors decreases the firm value more than within a (matched) single share company

However, as discussed before it also matters who is on the board. The board of directors could consist of insiders, outsiders and grey directors. Insiders are executives that work for the firm. The outside directors of the company are directors that do not have strong links to management; they are independent from the company. Grey directors do not have a strong link to management, but a weak link to the company by, for example, doing business with this company. In this research will be focused on inside and outside directors on the board. Board composition is widely discussed in corporate governance

literature and whether the composition of the board influences the effectiveness of the board of directors (Hermalin & Weisbach, 1991).

As mentioned before, the board of directors originates from the agency problem (Jensen, 1993). However, the directors within the board are agents themselves and do not necessarily have perfectly aligned interests with all the shareholders (Hermalin & Weisbach, 1991). This is especially the case for inside directors, these directors could have more aligned interests with the management (control) than with the shareholders. Notwithstanding even outside directors could have more aligned interests with management than with the rest of the shareholders. In general the CEO appoints the board of directors (Hermalin & Weisbach, 1991).

On the contrary, there are some explanations why an outside director establishes more aligned interests with the shareholders, than an inside director. These reasons consist of the directors having legal accountability towards the shareholders and they want to maintain a reputation as a capable monitor in a board of directors (Hermalin & Weisbach, 1991). In most researches the evidence suggests that having outside directors is needed for an effective board (Fuzi, Halim & Julizaerma, 2016).

As with board of directors' size, in dual share companies the agency problem could be more present than in companies with single share structure. Consequently, the board of directors could be of more importance in a dual share company, monitoring for the other shareholders. All things considered, having outside directors in the board of directors in a dual share company could be beneficial. Hence, hypothesis 9 is defined as:

H9: Within a dual share company, a higher proportion of outside directors in the board of directors increases the firm value more than within a (matched) single share company

CHAPTER 3: Data

The hypotheses formulated will be tested using a unique dataset consisting of publicly traded firms in the United States from 1998 till 2017.

The United States is selected, because currently the United States is one of the only countries among the biggest top global financial centre where dual class shares are legal and commonly used (Huang, 2017). Additionally, in the United States investors are relatively strongly protected compared to other countries (Masulis, Wang & Xie; 2009).

Therefore, it is assumed that the differences between dual share companies and single share companies should be smaller than in countries where outside shareholders are less protected. Finally, a lot of well-known U.S. companies adjust their share structure to dual share structure, especially technical companies (Bloomberg, 2017).

The timeframe of the research is chosen to be 1998 till 2017, this is a broad timeframe therefore the evolving of dual share structure can be displayed. Furthermore, the most analyses of dual shares are out-dated, that is why the most recent years available are chosen. Consequently, this study is the most recent one yet on dual share structure, as far as my knowledge goes.

3.1. Identifying dual-class firms

The most important step is to identify which firms have multiple shares. For identifying dual-class firms the data collection process done by Kim & Michaely (2018), Gompers, Ishii & Metrick (2010) and Jordan, Kim & Liu (2016) will be followed. There are two commonly used ways to identify whether a U.S. company has a DSS.

The first way is to compare the CUSIP codes in the Centre for Research in Security Price database (CRSP). Whenever a firm has an identical six-digit CUSIP code within their eight-digit CUSIP code but a different two-digit CUSIP code, it is a potential dual share firm. This is relevant because a different eight-digit CUSIP code represents a different share. However, the same six-digit CUSIP code represents a share from the same company. Therefore, if these two are taken together, it suggests that the company potentially possesses multiple classes of shares.

In this paper, All CUSIP codes from 1998 till 2017 are collected. The CUSIP codes with the same six-digit codes but different eight-different codes are added to the potential dual share sample.

The second way is to compare the shares outstanding on Compustat and the shares outstanding on CRSP (Gompers, Ishii & Metrick (2009); Kim & Michaely (2018)). This is effective because CRSP only reports the common shares outstanding and Compustat reports all shares outstanding (Gompers, Ishii & Metrick (2009)). A significant difference in the shares outstanding reported by these two databases, would suggest the firm having multiple classes of shares.

Gompers, Ishii & Metrick (2009) were the first to use this identification of dual shares process and included the firm-year to their sample if the difference between

CRSP and Compustat was bigger than 1%. Kim & Michaely (2018) and Jordan, Kim & Liu (2016) followed their methodology and decided to assign different percentages to the difference, which were 2% and 5%. In this research is assumed that a firm is a potential dual class firm whenever the difference between the shares outstanding in Compustat and CRSP is bigger than 5%. This decision is made because whenever the difference is bigger, the chance of the firm actually being a dual class firm increases.

For both methods it needs to be verified whether these companies actually possess a dual share structure. The potential firm-years in the potential dual class sample are matched with the databases of Andrew Metrick and Jay Ritter. Andrew Metrick collected dual share firm-years for 1994-2002 and Jay Ritter collected dual share IPO's from 1980-2018. Lastly, both methods are matched to one another, if a firm is identified via both methods, it is assumed to possess DSS.

3.2. Sample selection

To get to the sample used in this research; trusts, ADRs, units and REITS are removed. Next to that, financial firms, utility firms and unclassified firms are excluded¹.

To create the dataset, firm-level financial data is taken from Compustat and CRSP. It is required that the observations have book assets, Tobin's Q, market leverage, sales, asset tangibility, return on assets, revenues, employees, age, operating income before depreciation and a SIC code, otherwise the observation is excluded. The SIC codes differ largely between the firm data gathered from Compustat, CRSP and the data from Jay Ritter. Guenther & Rosman (1994) researched the differences in the SIC codes for Compustat and CRSP and found that the most significant results in research are produced with the SIC codes from Compustat. Based upon his finding, the SIC codes that differ largely will be taken from Compustat instead of CRSP. After, if the value for research and development expenses or advertising is missing, these values are set to 0, as is commonly done. Next, all these variables are winsorized by 1% and 99%.

Finally, to test the effect of the governance measures on the dual class firms, these need to be added to the observation. The governance mechanisms: executive

¹ Financial firms are the companies with Standard Industrial Codes (SIC) 6000-6999, utility firms are firms with SIC codes 4900-4999 and unclassified firms are firms with the SIC codes 9900-9999.

compensation, board size and outsiders in the board are retrieved from ExecuComp and BoardEx.

3.3. Summary and descriptive statistics

The full dataset consists of 79.367 firm years, whereof 9.306 dual share structure firm years. The dual share structure firm years consist of approximately 11,7% of the total dataset, which is close to the total market capitalization of dual share structure, in Compustat 8% of the companies have dual share structure (Gompers, Ishii & Metrick, 2009). Table 1 provides an overview of the summary statistics of the variables in the full sample.

The variables of interest are dual share dummy, growth opportunities, age, capital expenditures and board size and outsider percentage. Dual share is a dummy, which is 1 if the company has a dual share structure and 0 otherwise. Growth opportunities are measured as the book value of equity over the market value of equity. The average growth opportunities are 58,4% and surprisingly there are companies with negative growth opportunities. Age is measured as the years since IPO; the average age of the companies in this sample is 14,8 years. Table 1 shows a negative minimum age, this is due that this company (Snap-on Inc.) reported their financials before listing as a public company, their founding date is earlier than their IPO date. Cash and capital expenditures are measured relatively to total market capitalization. Executive compensation is the total compensation, salary, bonus and long-term incentive plan of the CEO. Board size is the number of directors on the board of directors; the average is 8,2 directors, which confirms the literature. Finally, outsider percentage is calculated as the amount of outsiders divided by the total number of directors. On average, 79% of the board of directors is an outsider for this sample.

The firm performances measures are ROA, the natural logarithm of Tobin's Q and labor productivity. Return on assets is net income over total book assets. As can be seen from Table 1, the average ROA is 1,032%, which tells us that the companies in the sample are efficiently taken an earnings advantage based on their assets. Tobin's Q is calculated as the market value of assets to the book value of assets, where market value is book assets + market equity – book equity – deferred taxes, inspired on the research by Kim & Michaely (2018). The natural logarithm is used instead of the regular Tobin's Q to smoothen the outliers. Labour productivity is measured as the amount of sales

divided by the lagged total working hours. The total working hours are the amount of employees multiplied by the hours based upon a fulltime job (2.087 hours). The other variables are explained in Appendix 1.

TABLE 1: Summary statistics

This table shows the summary statistics of the mentioned variables in the total sample. Dual share status and Media Firm are dummies that are either 0 or 1. Growth opportunities, Outsider percentage, Market leverage, Sales growth, Revenue growth, R&D/sales and Advertising/sales are percentages. Age is measured in years. Cash and capital expenditures are measured relative to market capitalization. Total assets, Market capitalization and size are in millions \$. The amount of employees is measured in thousands. The variables of interest are the variables on which the hypotheses are based. The variables are each explained in Appendix 1.

	Observations	Mean	Std. Dev.	Minimum	Maximum
Variables of interest					
Dual share status	79.367	0,117	0,322	0	1
Growth Opportunities	79.335	0,584	0,714	-3,725	7,062
Age	79.367	14,833	12,843	-18	55
Cash	78.796	0,174	0,730	-0,003	116,690
Capital expenditures	78.964	0,103	0,672	-0,092	136,154
Executive compensation	37.237	4,562	9,071	0	655,448
Board size	38.868	8,267	2,321	1	20
Outsider percentage	38.869	0,797	0,116	0	1
Firm performance measures					
ROA	79.367	1,032	0,753	0,001	4,624
ln (Tobin's Q)	78.145	0,671	0,793	-5,047	8,655
Labour productivity	70.838	201,36	313,48	1,249	3661,81
Firm characteristics					
Total assets	79.367	3.329,693	8.625,85	3,352	171.797
Market capitalization	79.367	3.887,337	10.753,47	1,452	115.158
Size (log assets)	79.367	6,183	2,122	1,210	12,054
Market leverage	79.367	0,171	0,211	0	0,935
R&D/Sales	79.367	0,380	2,517	0	55,511
Advertising/sales	79.367	0,012	0,033	0	0,480
Sales growth	79.367	5,810	2,364	-1,635	11,186
Employees	78.906	10,504	24,520	0,009	200
Revenue growth	76.721	1,151	0,522	0,039	7,422
Media firm	79.367	0,001	0,038	0	1

Table 2 shows an overview of the descriptive statistics of the most important variables, including the differences between dual share structure and single share structure. Most of the differences are significant, which makes sense because propensity score matching is not yet applied.

What stands out in the table that dual class companies have much bigger assets, resulting in a bigger size and market capitalization. Dual share companies are younger than single share companies, in contrary to the findings of Kim & Michaely (2018) and Gompers, Ishii & Metrick (2009). This could confirm that there is an increase in dual share companies in the past years. DSS firms are more highly levered, suggesting that they are less eager on issuing additional equity than single share companies. As expected, dual share companies have higher growth opportunities and the executives earn higher compensation. Interestingly, the R&D/sales is lower for DSS companies, this was not expected, nonetheless there are numerous factors playing a role in this variable.

ROA, the natural logarithm of Tobin's Q and labour productivity will be used as the valuation measures in this research; they are all lower for DSS. However, Table 2 only presents the descriptive statistics and does not indicate a causal effect.

TABLE 2: Descriptive statistics on Dual-Class and Single-Class Firms

This table shows the descriptive statistics on the dual class and single class firms in the total sample. The variables are each explained in Appendix 1. Dual - Single are the differences between the means of the variables of the dual class sample and the single class sample, tested by a t-test. The significance is shown with *, **, *** at 10%, 5% and 1% levels.

Variable	Single class		Dual Class		Dual - Single
	Mean	Std Dev	Mean	Std Dev	Difference
Total Assets	2.794,024	7.266,765	7.362,53	1.4785,65	4.568,506***
Size (log assets)	6,071	2,066	7,026	2,333	0,955***
Age since IPO (in years)	15,341	13,062	11,009	10,276	-4,332***
Market leverage	0,167	0,212	0,195	0,212	0,028***
Market Capitalization	3.341,631	9.552,626	7.995,735	1.6736,89	4.654,10***
R&D/sales	0,397	2,566	0,251	2,098	-0,146***
Advertising/sales	0,012	0,033	0,016	0,037	0,004***
Sales growth	5,712	2,326	6,547	2,511	0,835***
Employees	9,462	23,067	18,391	32,468	8,929***
Revenue growth	1,151	0,523	1,155	0,521	0,004

Growth opportunities	0,580	0,713	0,614	0,721	0,034***
ROA	1,049	0,765	0,901	0,643	-0,148***
Tobin's Q	2,189	3,126	2,148	3,291	-0,041
ln (Tobin's Q)	0,677	0,792	0,623	0,794	-0,054***
Labor productivity	201,75	314,81	198,30	302,70	-3,45
Media Firm	0,0009	0,023	0,0055	0,074	0,0046***
Executive compensation	4,451	8,849	6,100	11,62	1,648***
Cash	0,174	0,762	0,169	0,402	0,004
Capital expenditures	0,102	0,704	0,110	0,347	0,008
Board size	8,251	2,305	8,481	2,514	0,231***
Outsider percentage	0,799	0,114	0,770	0,131	-0,028***
Observations	70.061	-	9.306	-	

CHAPTER 4: Methodology

In order to answer the research question, an empirical framework is designed. Different empirical models are created to assess the effect of DSS on firm performance.

Two different samples will be used for the regressions. The first sample is the complete sample that has been explained in the data section. The second sample is a matched sample. In this sample dual class firms are matched to single class firms with closely similar characteristics by using propensity score matching (PSM). Through the use of PSM, the non-randomization choice of dual share structure is accounted for in turn to decrease the endogeneity concerns. There will be matched on Nearest Neighbour matching, Kernel matching and Radius Matching. Once the matched sample is established, regressions will be performed with PSM on the outcome variables.

To determine whether dual shares have a causal effect on firm performance, different OLS regressions will be executed. There will be checked for endogeneity issues. To assess whether maturity, R&D/sales and growth opportunities in dual share companies have an extra influence on the firm performance, interaction terms are created for these variables.

After testing for the effect of DSS on firm performance in general, the effect of the proposed governance mechanisms on firm performance will be checked. Starting with the casual effect of the governance mechanisms on firm performance, tested by an OLS regression. Next, these governance mechanisms (*cash*, *capital expenditures*, *executive*

compensation, board size and outsider percentage) are interacted with dual status, to investigate their shared effect on total shareholder value.

4.1. Outcome variables

As stated before, the natural logarithm of Tobin's Q, ROA and labor productivity measure firm performance. Tobin's Q is the most common way to measure market-based firm valuation, especially in relation to DSS (Gompers, Ishii & Metrick, 2009; Kim & Michaely, 2018; Jordan, Kim & Liu, 2016). The natural logarithm of Tobin's Q will be used to smooth the outliers in the Tobin's Q. ROA is interesting because it is an accounting measure of profitability and it shows how the firm performs based on its assets. Labor productivity is a productivity value and indicates how the firm is operating.

In Appendix 2 the correlation matrix between the performance measures is displayed. By analysing this matrix, the threshold of 0.5 is not exceeded between the valuation measures. Therefore, it is useful to include all three of the valuation measures.

The control variables are based on the conceptual framework of Dey, Nikoleav & Wang (2015). The control variables are size (log assets), market leverage, R&D/Sales, advertising/Sales, asset tangibility, sales growth, ROA, employees, pay-out ratio, age and industry and year dummies.

4.2. Matched sample with Propensity Score Matching

It can be seen in Table 2 that dual share structured companies are different than single share structured companies. Therefore, it would be beneficial to match the dual class companies to single share companies with the same characteristics. Next to that, firms do not randomly choose to adopt dual share structure. Dual share structure could be endogenous to certain fundamentals within the firm.

That is why propensity score matching (PSM) is used. PSM is a method that predicts the estimated probability of a treatment while looking at certain background characteristics at every observation (Dehejia & Wahba, 2002). In this case the treatment would be if firm i has a dual share structure in year t . Then it is evaluated with PSM what the chance is that a firm, based on its characteristics, could have a dual share structure. This is called the propensity score; a propensity score is defined by looking at

the predicted probability of the treatment. The background characteristics on which the propensity score is based should be chosen carefully.

The decision is based to match on the change of the size of the firm (log assets), the change of ROA, asset tangibility, change of natural logarithm of sales, capital expenditures over assets, revenue growth, advertising over sales, R&D over sales, whether the firm is a Media Firm or not, asset uniqueness based on R&D and industry and year dummies. The decision of which variables are matched on is based on the probit model of Dey, Nikoleav and Wang (2015). Furthermore, the deltas and natural logarithms of some variables are taken to control for the different effects the variables could have. Probit regressions with dual share structure as dependent variable are performed to estimate the probability of DSS in firms. Equation 1 describes the probit model used.

$$(1) \quad \text{Prob}(\text{Dual} = 1) = \alpha_0 + \beta_1 \Delta \text{Size} + \beta_2 \Delta \text{ROA} + \beta_3 \text{Asset Tangibility} + \beta_4 \Delta \log(\text{Sales}) + \beta_5 \text{Capex/Assets} + \beta_6 \text{Revenue Growth} + \beta_7 \text{Advertising/Sales} + \beta_8 \text{R\&D/Sales} + \beta_9 \text{Media Firm} + \beta_{10} \text{Asset Uniqueness R\&D} + \text{SIC 2-digit dummies} + \text{Year dummies} + \varepsilon$$

Dual is 1 if the firm year has a dual structure and 0 otherwise. Δ Size is the change from year $t - 1$ to year t of the natural logarithm of the firms' assets. Δ ROA is the change from year $t - 1$ to year t in return on assets. Asset Tangibility is the net PPE expenses over total book assets. $\Delta \log(\text{Sales})$ the change from year $t - 1$ to year t of the natural logarithm of the firms' sales. Media firm is 1 if the firm is a media firm and is 0 otherwise. A firm is a media firm when its' SIC code is 2710, 2711, 2730, 2731, 4830, 4832, 4833, 4840, 4841, 7810, 7812 or 7820. Media Firm is added to the probit regression because dual share structured companies have a higher probability at being a media firm, as presented in Table 2. Next to that, there is a higher expectation that media firms structure their company with dual status, because in this industry there is more room for extracting private benefits (DeAngelo & DeAngelo (1985); Smart & Zutter (2003); Gompers, Ishii & Metrick (2009)). In the probit regression industry and year dummies are included to control for industry and year effects. Capital expenditures over assets, revenue growth, advertising over sales, R&D over sales and asset uniqueness R&D are explained in Appendix 1. After the probit regression, all firms will be assigned with a propensity score.

For the matched sample is decided to match only 1 observation of the treated sample to 1 observation of the untreated sample. Otherwise, it could be that an observation of the untreated sample will be matched to the treated sample multiple times. Additionally, the choice is made to match only if there is an untreated observation within a radius of 1% of the treated observation. Hence, nearest neighbour matching combined with radius matching of 1% is used. The different PSM methods such as nearest neighbour matching and radius matching will be further explained in section 4.2.1.

A major advantage of this PSM method is that the matched treated group and the matched untreated group will look certainly similar. Then, the regression in the matched sample will control for endogeneity, which the full sample does not do.

When using PSM, the (potential) treatment and the control group need to possess similar characteristics. Fundamentals could differ per industry and per year, thus it is needed to have similar industries and years to match upon. Therefore, it is first examined if there are enough observations per industry (SIC 2 digit) and per year. For every industry, it is chosen to only include the industry when there are at least 50 observations for both the treatment as the control group in the sample and at least 5 observations for both groups per year. It is noticed that there are only a few observation left in 1998, therefore this whole year is deleted, otherwise it is too difficult to find a close match for this year. In this way it is easier to match the dual share companies to similar single share companies and see more clear results from the matching.

Figure 1 below illustrates the normal distributions and the density of the propensity scores for the matched sample. The distribution of the propensity scores of the single class and dual class companies look a like. As can be seen in Table 3, the means of the propensity scores are likewise very similar. The means and distributions do not overlap perfectly, but that is necessary for propensity score matching. If they were to be perfectly the same; dual share structure does not have an impact on firms. In both groups the highest propensity score is around 0.51, this means that there are no firm year observations in the matched sample which have with certainty DSS.

FIGURE 1: Normal distribution and density of the propensity scores for dual share companies and single share companies

This graph shows the normal distribution and the density of the estimated propensity scores. In the left panel the graph is shown for the propensity scores for the matched single share companies and on the right the graph is shown for the matched dual class share companies.

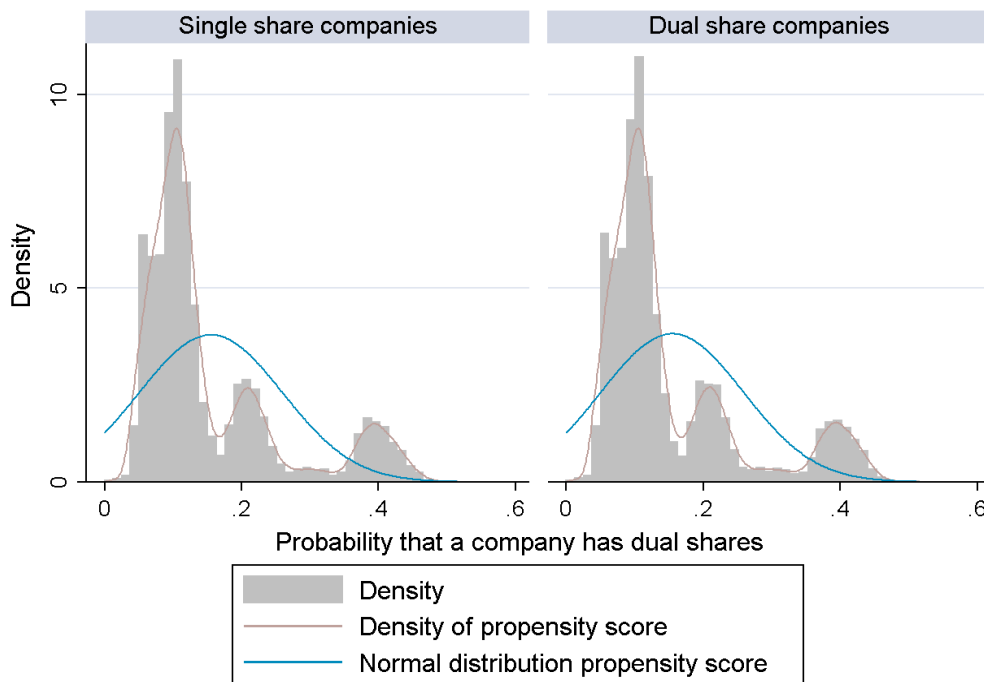


TABLE 3: Summary statistics propensity scores

The summary statistics for the propensity scores in the matched sample are explained here. The amount of observations, the means, standard deviations, minima and maxima of the single share companies and dual share companies of the matched sample are shown in this table.

Propensity score	Observations	Mean	Std. Dev.	Minimum	Maximum
Single share companies	6.790	0,155	0,105	0,000007	0,5168
Dual share companies	6.790	0,154	0,104	0,000619	0,5122

When the propensity scores are created, the observations only will be matched to observation from the same industry and year. Therefore, all matched companies in our sample are matched on the characteristics explained in equation 1 and on industry and year. For the industry it is chosen to only look at SIC 2-digit code, otherwise there would have been to few observations.

In Figure 1 and Table 3, it already appeared that the matching is successful. However, it still needs to be checked if the matched variables are balanced in the

matched sample, which means that the differences in means are not significantly different for the treated and untreated group in the matched sample. The matched variables are displayed in Table 4; the matched variables are compared between the unmatched sample and the matched sample.

The matching turned out rather satisfactory. The differences in means between the variables in the matched sample are almost all not statistically significant, resulting in an useful matching procedure. It can be seen in Table 4 that the difference in means for Media Firm is still statistically significant for the matched sample. The difference in the matched sample is 0,15 percentage points lower than in the full sample, hence the difference between the treatment group and control group has become smaller. That media firm is still significant is not surprisingly, because this is one of the characteristics that a dual class company is more likely to possess. Hence, media firm is the only matching variable that is not balanced in the matched sample. In conclusion, the matching has been proved to be almost completely valuable in the matched sample and should control for endogeneity concerns.

TABLE 4: Matched variables unmatched and matched sample

This table shows the variables on which are matched and therefore the matched sample are created. In panel A the unmatched sample is shown and in panel B the matched sample is displayed. The significance is shown with *, **, *** at 10%, 5% and 1% levels.

Variable	Panel A Unmatched sample (N=71.481)				Panel B Matched sample (N=13.580)			
	Treatment group	Control group	Difference	T-statistic	Treatment group	Control group	Difference	T-statistic
Δ Size	0,0750	0,0624	0,013***	-3,54	0,0723	0,0774	-0,0051	-0,87
Δ ROA	-0,0038	0,0027	-0,0065***	2,29	-0,0020	-0,0059	0,0039	0,80
Asset tangibility	0,5602	0,4944	0,0658***	-14,21	0,5609	0,5774	-0,0165	-1,87
Δ log (Sales)	0,0760	0,0738	0,002	-0,42	0,0752	0,0746	0,0006	0,06
Capex/assets	0,0709	0,0615	0,0094***	-10,26	0,0638	0,0639	-0,0001	-0,10
Revenue growth	1,1553	1,1507	0,0046***	-0,77	1,1397	1,1467	-0,0070	-0,69
Advertising/sales	0,0160	0,0117	0,0043***	-11,68	0,0145	0,0140	0,0005	0,74
R&D/sales	0,2513	0,3972	-0,1459***	5,25	0,2320	0,2970	-0,0650	-1,37
Media firm	0,0055	0,0009	0,0046***	-10,97	0,0049	0,0018	0,0031***	2,85
Asset uniqueness R&D	0,0436	0,0672	-0,0236***	11,40	0,0419	0,0437	-0,0018	-0,72

4.2.1. Propensity Score Matching methods to assess the causal effect of DSS on the dependent variables

The matched sample is established by matching one observation from the treatment group to one observation of the control group, using a radius of 1% and Nearest Neighbour matching.

The benefit of PSM is that this approach can also be used as a method to assess the effect of the treatment (DSS) on the dependent outcome variables. Consequently, different methods of PSM will be used to consider the influence of dual share structure.

There are different ways in how observations could be matched. This study focuses on three different matching methods: Nearest Neighbour Matching, Kernel Matching and Radius Matching. Nearest Neighbour Matching is 1 on 1 matching; it matches every observation from the treatment group (DSS) with the closest observation from the non-treatment group. In this research, the decision is made to match only on the closest match. Radius Matching is matching the observations within a certain radius. A radius of 10% is used, 10% is used instead of the 1% of the matched sample because then the effect could appear clearer. Finally, Kernel Matching is matching the observations within a radius while applying bigger importance to the non-treated observations that lie close to the treatment-observations. A radius of 10% will again be used for the Kernel Matching.

4.3. Multivariate OLS Regression Models

In this section, multivariate OLS regression models will be introduced. These models will attempt to evaluate the causal relation between DSS and the performance measures. Robust standard errors are used to account for heteroskedasticity. Next to that, endogeneity issues are taken into account with examining the Variance Inflation Factor (VIF). The VIF will be used to control for possible multicollinearity, the benchmark of the VIF is 4. Whenever the variable's VIF takes a value higher than 4, the OLS model will be corrected correspondingly.

All the upcoming regressions will be done in the full sample and in the matched sample.

4.3.1. OLS regression with causal relation between DSS and performance

In order to understand how DSS influences firm performance, an OLS regression will be performed. The regression equation is indicated in Equation 2.

Dual share structure is the variable of interest and is measured by a dummy variable *Dual* that is either equal to 1 when firm *i* has dual share structure in year *t* or 0 when it does not have a dual share structure. y_{it} is equal to a measure of performance including ln(Tobin's Q), ROA and labour productivity. The other variables are the control variables. When ROA is used as performance measure, ROA is removed as control variable in the regression equation. ε_{it} is the random error for firm *i* in year *t*.

$$(2) \quad y_{it} = \alpha_{it} + \beta_1 Dual_{it} + \beta_2 Size_{it} + \beta_3 Market\ Leverage_{it} + \beta_4 R\&D/sales_{it} + \beta_5 Advertising/Sales_{it} + \beta_6 Asset\ tangibility_{it} + \beta_7 Sales\ Growth_{it} + \beta_8 ROA_{it} + \beta_9 employees_{it} + \beta_{10} payout\ ratio_{it} + \beta_{11} Age + \beta_{12} SIC + \beta_{13} year + \varepsilon_{it}$$

4.3.2. OLS performance regression with interaction terms

After establishing the causal relation between DSS and firm performance, an OLS regression with interaction terms will be conducted. These interaction terms consist of the interaction between the maturity and the growth opportunities of the company with DSS to test for hypothesis 3 and 4.

It is regularly stated in research that DSS is beneficial for the company in the first years, nonetheless that the benefits of DSS erode over time (Kim & Michaely, 2018). The benefits erode over time, because it is expected that the agency costs increase over time. By having an interaction term of time and dual shares status, this could be tested.

That is why the variable *Mature* is introduced, to check for maturity in our research. The mean of the age since IPO for a dual share structure is 11, as can be seen in Table 2. If the company is older than 11 years, it is assumed to be mature. *Mature* can take the value of 1 or 0. In equation 3, the OLS regression is demonstrated; the same control variables as in equation 2 are used. The interaction term is a variable that consists of two binary dummy variables. The interaction term is 1, if the firm is a mature dual share company and 0 otherwise. In Equation 3 *Age* is removed as a control variable, because *Mature* and *Age* have a high correlation.

$$(3) \quad y_{it} = \alpha_{it} + \beta_1 \text{Dual}_{it} + \beta_2 \text{Mature}_{it} + \beta_3 \text{Dual} * \text{Mature}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Market Leverage}_{it} + \beta_6 \text{R\&D/sales}_{it} + \beta_7 \text{Advertising/Sales}_{it} + \beta_8 \text{Asset tangibility}_{it} + \beta_9 \text{Sales Growth}_{it} + \beta_{10} \text{ROA}_{it} + \beta_{11} \text{employees}_{it} + \beta_{12} \text{payout ratio}_{it} + \beta_{13} \text{SIC} + \beta_{14} \text{year} + \epsilon_{it}$$

To test for hypothesis 3, growth opportunities are used as interaction term, as shown in equation 4.

Growth opportunities ought to increase the firm value of a dual status company. The interaction term is a variable that consists of one binary dummy variable *Dual* and the continuous variables *Growth Opportunities*.

Once a company has dual status it is predicted to be more able to invest in research and development, because the company will be less controlled by the outside shareholders. Hence, the dual share company should be more able to exploit on their growth opportunities. Subsequent, the insiders could invest in good projects that would otherwise be perceived by outside shareholders as risky.

$$(4) \quad y_{it} = \alpha_{it} + \beta_1 \text{Dual}_{it} + \beta_2 \text{Growth Opportunities}_{it} + \beta_3 \text{Dual} * \text{Growth Opportunities}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Market Leverage}_{it} + \beta_6 \text{R\&D/sales}_{it} + \beta_7 \text{Advertising/Sales}_{it} + \beta_8 \text{Asset tangibility}_{it} + \beta_9 \text{Sales Growth}_{it} + \beta_{10} \text{ROA}_{it} + \beta_{11} \text{employees}_{it} + \beta_{12} \text{payout ratio}_{it} + \beta_{13} \text{Age} + \beta_{14} \text{SIC} + \beta_{15} \text{year} + \epsilon_{it}$$

4.3.3. Governance mechanisms on firm value

Dual share status is a severe form of a corporate governance mechanism. As previously mentioned, a company with dual share structure is practically immune to a hostile takeover.

There are plenty of other corporate governance factors that could have an influence on the firm value. In the literature review is indicated that cash, capital expenditures, executive compensation, board size and outsiders on the board could have an influence on the performance of a dual and single share structured company. For this reason, these corporate governance mechanisms will be tested independently on the dependent variables of firm performance.

In Equation 5, cash and capital expenditures are measured as the amount of cash and amount of capital expenditures relative to market capitalization. Outsiders on the

board are the amount of outsider directors on the board in a percentage of the total board of directors. Executive compensation is the amount of annual total compensation the CEO receives including salary, bonus, restricted stock grants, long term incentives plan and other annual compensation. Board size is the amount of directors on the board of directors.

In Appendix 3, the correlation matrix of the governance mechanisms is provided. The correlations amongst the governance mechanisms do not exceed the threshold of 0.5. Consequently, all governance mechanisms are included in Equation 5.

$$(5) \ y_{it} = \alpha_{it} + \beta_1 \text{Dual}_{it} + \beta_2 \text{Cash}_{it} + \beta_3 \text{Capex}_{it} + \beta_4 \text{Outsiders on the board}_{it} + \beta_5 \text{Executive compensation}_{it} + \beta_6 \text{Board size}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{Market Leverage}_{it} + \beta_9 \text{R\&D/sales}_{it} + \beta_{10} \text{Advertising/Sales}_{it} + \beta_{11} \text{Asset tangibility}_{it} + \beta_{12} \text{Sales Growth}_{it} + \beta_{13} \text{ROA}_{it} + \beta_{14} \text{employees}_{it} + \beta_{15} \text{payout ratio}_{it} + \beta_{16} \text{Age}_{it} + \beta_{17} \text{SIC} + \beta_{18} \text{year} + \epsilon_{it}$$

4.3.4. Governance mechanisms interacting with DSS

After looking at the independent effect of the governance mechanisms on the firm value and the independent effect of DSS on performance, the governance mechanisms will be interacted with dual share status. In order to test for hypotheses 5 till 9, interaction terms between the governance mechanisms and dual status are incorporated.

In Equation 6 the OLS regression model is described. In this model the interaction between dual share status and a governance mechanism is the variable of interest. The governance mechanism will either be cash, capital expenditures, outsiders on the board, executive compensation or board size.

More cash could cause that the insiders extract more private benefits, which is already extra accessible in a company with dual status. Therefore, the interaction between cash and dual status is included. Capital expenditures are an approach for a manager to obtain private benefits. As this already a focus point of DSS companies, insiders of dual share companies are more expected to make value destroying capital expenditure decisions. Therefore, the interaction between capital expenditures and dual status is researched by implementing an interaction term. A company with dual status should be governed better with other mechanisms such as a board of directors, because the outside shareholders have less influence on the decisions of the managers than in single share structured company. Hence, it is researched if the board size and the

amount of outsiders in the board interact with the dual status. Through executive compensation wealth could be transferred from outside shareholders to the insiders of the company. Executive compensation could have either a positive or negative effect on total firm value. Consequently, there is an interaction term between these two included in model 6.

First, a regression will be performed with all the interaction terms together, although it is expected that this will cause multicollinearity. Following, all the governance mechanisms will be interacted independently with dual status.

$$(6) \ y_{it} = \alpha_{it} + \beta_1 \text{Dual}_{it} + \beta_2 \text{Governance Mechanism}_{it} + \beta_3 \text{Dual} * \text{Governance Mechanism}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Market Leverage}_{it} + \beta_6 \text{R\&D/sales}_{it} + \beta_7 \text{Advertising/Sales}_{it} + \beta_8 \text{Asset Tangibility}_{it} + \beta_9 \text{Sales Growth}_{it} + \beta_{10} \text{ROA}_{it} + \beta_{11} \text{employees}_{it} + \beta_{12} \text{payout ratio}_{it} + \beta_{13} \text{Age}_{it} + \beta_{14} \text{SIC} + \beta_{15} \text{year} + \epsilon_{it}$$

CHAPTER 5: Results

The regressions are done in the full sample and matched sample. For convenience only the regressions done in the matched sample are included. The regressions performed in the full sample will be included in the Appendix. Only for the first regression both samples will be included. Additionally, only the regressions with significant results are included in this research and the rest can be found in the Appendix. For the sake of conciseness the coefficients of the industry and year dummies are not included in the tables.

5.1. Causal relation performance measures and DSS

As shown in Table 2, dual status companies have a lower return on assets, lower natural logarithm of Tobin's Q and insignificantly lower labour productivity and Tobin's Q than the single share companies. These findings show promising indications for the hypotheses, yet further research is required.

Therefore, a causal relation is predicted between the performance measures and dual status by performing OLS regressions. Regression 2 is performed with the three different performance measures; ln(Q), ROA and labour productivity. The results are

shown in Table 5. The different performance measures estimate different outcomes of the variable of interest *Dual Share Status*.

The model has been checked for endogeneity using VIF, endogeneity has been confirmed and therefore the models in Table 5 are adjusted accordingly. The control variables *Size* and *Sales Growth* are endogenous to each other, that is why in some models, one of them or both are deleted. Next to that, in column 4 and 6 *Size* measured as the logarithm of assets is replaced by the natural logarithm of market capitalization.

Table 5 shows the regression results for both the unmatched (panel A) as the matched sample (panel B). In panel B, all performance measures that are significant show a negative effect of dual status on firm performance. The negative effect is slightly less severe than in the unmatched sample, which is expected because in the matched sample the companies have more or less the same characteristics. ROA and the natural logarithm of Tobin's Q are significantly negatively affected by dual status.

According to the causal effect of dual status on firm performance measures, dual status has a negative effect on firm performance. For ROA this effect will result approximately in a lower return on assets around 0,07. The natural logarithm of Tobin's Q in a dual share company will decrease in 0,1 lower $\ln(\text{Tobin's Q})$, which means that the Tobin's Q of a dual share company will be around 10% lower than a single share company. Finally, labour productivity decreases with 66,2 if the company has dual share structure. These findings are in line with hypothesis 2, that dual share structure has a negative impact on the firm value of a company.

5.2. Propensity Score Matching as performance measure

Table 6 below illustrates the findings of Propensity Score Matching. For each dependent variable, Nearest Neighbour, Kernel and Radius matching are used. The only significant results are with ROA and all these results are significant at a 1% level. All results for ROA have a negative treatment effect; therefore it implies that if a company has dual status that this results in a lower ROA, accepting hypothesis 2 again.

The effect of dual status is the most severe for Nearest Neighbour Matching. Dual status results in a lower ROA of 10,9%. The other two PSM methods predict a slightly lower effect of dual status, a negative effect around 9,8%. Combining the results from table 5 and table 6, dual status finds a significant negative effect on ROA.

TABLE 5: Causal effect of Dual Status on firm performance measures

This table shows the causal effect of dual status on the three different performance measures. First the predicted model is given for each of the performance measures and then the adjusted model is shown in this table, here is controlled for the endogeneity concerns. In panel A the unmatched sample is shown and in panel B the matched sample is displayed. The robust standard errors are the numbers in parentheses and the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Variable of interest	Panel A						Panel B					
	Unmatched sample						Matched sample					
	ROA		ln(Q)		Labor productivity		ROA		ln(Q)		Labor productivity	
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	
Dual share status	-0.058*** (0.005)	-0.122*** (0.006)	-0.051*** (0.008)	-0.127*** (0.008)	-105.606 (81.287)	-73.695 (81.287)	-0.026*** (0.008)	-0.074*** (0.010)	-0.044*** (0.013)	-0.102*** (0.012)	-72.207*** (13.989)	-66.201*** (14.280)
Control variables												
Size (log assets)	-0.621*** (0.004)		0.134*** (0.006)		673.272*** (57.217)		-0.634*** (0.010)		0.165*** (0.015)		332.090*** (24.368)	
Market leverage	-0.028*** (0.009)	-1.290*** (0.013)	-1.437*** (0.012)	-1.279*** (0.012)	634.250*** (14.0052)	803.612*** (15.2040)	-0.040** (0.019)	-1.281*** (0.029)	-1.314*** (0.028)	-1.146*** (0.027)	142.575*** (37.930)	-82.290** (39.887)
R&D/sales	0.038*** (0.002)	0.020*** (0.001)	0.011*** (0.002)	0.035*** (0.002)	-69.185*** (6.239)	-17.225*** (2.024)	0.035*** (0.004)	0.018*** (0.002)	0.020*** (0.005)	0.045*** (0.006)	-20.177*** (2.622)	5.001** (2.161)
Advertising/sales	0.238*** (0.067)	0.150** (0.067)	0.542*** (0.117)	0.505*** (0.102)	-2,193.707*** (27.1586)	-1,702.048*** (23.4073)	-0.638*** (0.115)	-0.489*** (0.132)	0.797*** (0.216)	0.362* (0.189)	-237.429** (117.030)	-329.070*** (120.548)
Asset tangibility	-0.030*** (0.004)	-0.021*** (0.005)	-0.099*** (0.006)	-0.080*** (0.006)	305.473*** (42.900)	243.205*** (40.151)	-0.069*** (0.009)	-0.054*** (0.011)	-0.054*** (0.015)	-0.074*** (0.014)	17.865 (18.235)	-17.476 (18.742)
Sales growth	0.588*** (0.004)	0.372*** (0.003)	-0.121*** (0.006)		-511.383*** (49.795)	79.434*** (5.846)	0.598*** (0.011)	0.360*** (0.007)	-0.148*** (0.015)		202.303*** (20.795)	100.089*** (5.853)
ROA			0.093*** (0.007)	0.059*** (0.004)	538.522*** (32.748)	-48.105 (30.209)			0.156*** (0.018)	0.105*** (0.011)	471.739*** (41.964)	165.999*** (26.993)
Employees	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	-0.004*** (0.000)	-11.036*** (0.727)	-8.153*** (0.538)	0.000 (0.000)	-0.001*** (0.000)	0.001*** (0.000)	-0.004*** (0.000)	-5.610*** (0.353)	-4.985*** (0.333)
Payout ratio	0.034	-0.635***	-0.535***	-0.366***	11,295.080***	11,135.025***	-0.090	-0.606***	-0.724***	-0.911***	1,321.017*	1,282.177***

TABLE 5 continues

	(0.074)	(0.089)	(0.123)	(0.117)	(2,037.808)	(2,035.260)	(0.136)	(0.174)	(0.244)	(0.234)	(360.460)	(362.079)
Age (in years)	-0.001***	-0.000**	-0.003***	-0.007***	-15.070***	-17.717***	0.000	0.002***	-0.002***	-0.005***	-4.499***	-6.031***
	(0.000)	(0.000)	(0.000)	(0.000)	(1.386)	(1.568)	(0.000)	(0.000)	(0.001)	(0.000)	(0.817)	(0.860)
Size (log market capitalization)		-0.350***		0.147***				-0.351***		0.129***		
		(0.002)		(0.002)				(0.006)		(0.004)		
Regression information												
Constant	9.505***	17.837***	-4.788***	11.087***	-58,903.366***	-66,021.343***	7.520***	12.904***	-8.625***	5.542**	27,237.579	-29,608.663***
	(0.647)	(0.760)	(1.026)	(0.958)	(6,025.436)	(6,359.836)	(1.491)	(1.799)	(2.474)	(2.334)	(3,198.179)	(3,288.405)
Observations	78.556	78.556	77.423	77.423	78.556	78.556	13.428	13.428	13.250	13.250	13.428	13.428
R-squared	0.600	0.447	0.190	0.287	0.016	0.011	0.620	0.435	0.188	0.274	0.133	0.095

TABLE 6: Propensity Score Matching results

Nearest Neighbour matching is done to the closest neighbours. Kernel and Radius matching are matched with a radius of 10%. The treatment group is the group that has dual status and the non-treatment group is the control group consisting of single share structured firms. The robust standard errors are the numbers in parentheses and the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Dependent variable	Treatment group	Control group	Average treatment effect	T-statistic	N on support
Nearest Neighbour matching					
ROA	0,909	1,018	-0,109*** (0,014)	-7,710	13.580
Ln (Q)	0,593	0,603	-0,010 (0,015)	-0,660	13.398
Labor productivity	425,545	438,060	-12,516 (17,735)	-0,710	13.580
Kernel matching					
ROA	0,909	1,008	-0,099*** (0,012)	-8,530	13.580
Ln (Q)	0,593	0,608	-0,015 (0,013)	-1,160	13.398
Labor productivity	425,545	439,347	-13,803 (14,784)	-0,930	13.580
Radius matching					
ROA	0,909	1,007	-0,098*** (0,012)	-8,440	13.580
Ln (Q)	0,593	0,612	-0,019 (0,013)	-1,500	13.398
Labor productivity	425,545	438,471	-12,927 (14,755)	-0,880	13.580

5.3. Interaction terms with Dual status

In Table 7 the effect of maturity and the interaction of maturity and dual status on the performance measures are assessed. As mentioned before it is decided to include the matched samples in this paper and the full sample can be found in Appendix 4. Appendix 4 demonstrates stronger effects, but rather the same relationship as Table 7.

Maturity as an isolated variable has a negative significant effect on the performance of a company for all measures. This suggests that when a company matures, the firm value declines. Possibly because the growth opportunities will erode over time, nonetheless more factors should be taken into account.

When a dual share company is mature, the effect on firm value turns out to be even more negative. The negative effect of a dual share company being mature is even

greater than maturity independently. Return on Assets declines with 0.04 when a company is mature and possesses dual status. Tobin's Q declines with approximately 10% when a dual share company is mature. Labor productivity does not demonstrate clear results. Therefore, hypothesis 4 is accepted, suggesting that the benefits of a dual share company erode over time.

TABLE 7: Maturity as an interaction term with Dual Status

Maturity is measured when the company is older than the mean of 11. The effect of maturity and the effect of DSS is independently of each other assessed and as an interaction term. This table is the regression in the matched sample. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

	Matched sample					
	ROA		ln(Q)		Labor productivity	
	(1)	(2)	(3)	(4)	(5)	(6)
Variables of interest						
Dual share status	-0.013 (0.011)	-0.061*** (0.013)	-0.000 (0.018)	0.007 (0.018)	-72.350*** (20.148)	-58.234*** (20.602)
Mature company	0.004 (0.011)	0.054*** (0.014)	-0.028 (0.017)	-0.043** (0.017)	-116.255*** (19.414)	-147.596*** (20.014)
Dual share status * Mature company	-0.031** (0.015)	-0.040** (0.018)	-0.093*** (0.023)	-0.099*** (0.023)	16.508 (26.151)	3.940 (26.806)
Control variables						
Size (log assets)	-0.635*** (0.010)		0.162*** (0.015)		331.392*** (24.504)	
Market leverage	-0.040** (0.019)	-1.286*** (0.029)	-1.308*** (0.028)	-1.278*** (0.027)	-140.019*** (38.260)	-77.885* (40.304)
R&D/sales	0.035*** (0.004)	0.018*** (0.002)	0.020*** (0.005)	0.032*** (0.005)	-20.335*** (2.618)	4.698** (2.139)
Advertising/sales	-0.639*** (0.115)	-0.489*** (0.132)	0.795*** (0.215)	0.748*** (0.216)	-244.627** (117.303)	-336.168*** (121.164)
Asset tangibility	-0.069*** (0.009)	-0.054*** (0.011)	-0.054*** (0.015)	-0.071*** (0.015)	19.049 (18.377)	-16.049 (18.908)
Sales growth	0.599*** (0.011)	0.362*** (0.006)	-0.145*** (0.015)	0.003 (0.004)	-202.624*** (21.010)	98.744*** (5.751)
ROA			0.154*** (0.018)	0.003 (0.011)	470.292*** (41.870)	164.936*** (26.747)
Employees	0.000 (0.000)	-0.000** (0.000)	0.001*** (0.000)	0.001*** (0.000)	-5.713*** (0.354)	-5.112*** (0.335)
Payout ratio	-0.093 (0.137)	-0.594*** (0.175)	-0.752*** (0.244)	-0.768*** (0.243)	1,284.339*** (357.261)	1,231.943*** (358.743)
Size (log market capitalization)		-0.352*** (0.006)				
Regression information						
Constant	7.128*** (1.506)	12.658*** (1.813)	-9.652*** (2.485)	-11.014*** (2.496)	-27,739.706*** (3,265.823)	-30,335.859*** (3,358.499)
Observations	13,428	13,428	13,25	13,25	13,428	13,428
R-squared	0.620	0.435	0.190	0.179	0.133	0.095

Due to insignificance of the interaction term between growth opportunities and dual status on the performance measures in both samples, the decision is made to left these result out. Full results are shown in Appendix 5, if interested. Appendix 5 shows a detrimental relationship between the interaction term of growth opportunities and dual share status. This combination leads to the rejection of hypothesis 3.

If growth opportunities are assessed independently from dual status, they have a negative significant influence on ROA and the natural logarithm of Tobin's Q. This effect is quite strong for these performance measures. What is striking about this relationship is that it suggests that when a firm possesses more growth opportunities, it results in lower firm value. It could be that this effect is this strong because of the simplified way of how growth opportunities are measured, namely book equity over market equity. On the contrary, for labour productivity, growth opportunities have a positive effect, suggesting that if there are more growth opportunities people would work harder.

To conclude, in this section the interaction terms between dual status and maturity and growth opportunities are considered. The only clear evidence that appeared is that maturity in combination with dual status is negatively related to firm value, accepting hypothesis 4. In all the regressions labour productivity moved exactly the opposite direction as the other two firm value measures, this a rather unexpected outcome. Therefore, hypothesis 4 is accepted and for hypothesis 3 there is no clear evidence discovered, hence rejecting the hypothesis that high growth opportunities in a dual share company result in higher shareholder value.

5.4 Causal effect of governance mechanisms

In the previous regressions multicollinearity between sales growth and size was demonstrated and all the predicted models were adjusted for that. That is why equations 5 and 6 are adjusted accordingly and *Size* (log assets) is deleted from all the upcoming regressions. The choice is made to delete *Size* because *Sales Growth* contains more explanatory power, indicated by a higher R-squared.

Now all the OLS regressions are accounted for heteroskedasticity and multicollinearity. In Table 8 the results of the effect of the governance mechanisms on firm value are shown. The casual relations of the governance mechanisms will be

explained by looking at each performance measure individually, as shown in Table 8 for the matched sample and Appendix 6 for the full sample.

First, the natural logarithm of Tobin's Q has only a significant relation with cash and executive compensation in both samples. The causal relation of cash and executive compensation is as predicted. More cash decreases the firm value, Tobin's Q decreases with approximately 40%. Tobin's Q increases with approximately 1% due to an extra million in executive compensation. Higher executive compensation aligns the interests of management and shareholders, therefore resulting in a higher firm value.

Second, ROA shows a totally different relationship between the governance mechanisms as Tobin's Q, this could be because ROA is an accounting measure and Tobin's Q is a measurement of market valuation. ROA demonstrates in both samples an inverse relationship with outsiders in the board, executive compensation and board size. Therefore, suggesting that the return on assets declines when there are more outsiders on the board, the CEO a higher salary receives and when the board of directors gets bigger. Even though, the natural logarithm of Tobin's Q presents different outcomes, these outcomes of ROA are plausible. More outsiders on the board could result in more coordination problems. The CEO receiving a higher executive compensation could lead to the CEO extracting private benefits resulting in lower shareholder value. Plus in the literature review it was discussed that a small board tends to be more effective than a large board.

Third, capital expenditures and executive compensation have a positive significant effect on labour productivity and board size has a negative significant effect in relation to labor productivity. However, for cash and outsiders in the board there a contradicting results in the full sample, therefore labour productivity does not seem to be a strong performance measure here.

TABLE 8: Governance mechanisms causal effect on performance

This table shows the OLS regression of the variables which are used as governance mechanisms; cash, capital expenditures, outsider percentage, executive compensation and board size. Cash is measured as total cash divided by market capitalization, capital expenditures in the same way. Outsider percentage is the amount of outsiders divided by the total number of directors. Executive compensation is the total salary the CEO receives. Board size is the number of directors on the board. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Matched sample			
	ROA	ln(Q)	Labor productivity
	(1)	(2)	(3)
Variables of interest			
Dual share status	0.083*** (0.025)	-0.121*** (0.021)	-95.505** (37,121)
Cash	-0.073 (0.056)	-0.577*** (0.139)	296.368** (125.115)
Capital expenditures	0.097* (0.052)	0.006 (0.086)	377.226** (166.019)
Outsider percentage	-0.132*** (0.046)	-0.020 (0.043)	2.432 (38.435)
Executive compensation	-0.015*** (0.002)	0.007*** (0.001)	6.362*** (2.256)
Board size	-0.038*** (0.007)	0.002 (0.004)	-26.106*** (7.828)
Control variables			
Market leverage	-0.930*** (0.066)	-1.452*** (0.065)	-400.896*** (94.705)
Advertising/sales	-0.249*** (0.068)	0.301* (0.157)	206.099*** (59.555)
Asset tangibility	-1.893*** (0.302)	1.800*** (0.283)	-641.437** (267.088)
Sales growth	0.136*** (0.017)	-0.037*** (0.011)	269.447*** (35.935)
ROA		0.032 (0.020)	302.831*** (76.349)
Employees	-0.001 (0.001)	0.002*** (0.000)	-9.306*** (1.263)
Payout ratio	0.723 (0.539)	0.326 (0.501)	-570.713 (580.516)
Age (in years)	0.001 (0.001)	-0.002*** (0.001)	-8.885*** (1.703)
Regression information			
Constant	12.588** (5.079)	-8.956** (4.319)	-22,750.864*** (5,861.132)
Observations	2,887	2,873	2,887
R-squared	0.165	0.345	0.178

5.5. Interaction terms governance mechanisms and DSS

A regression is performed with all the governance mechanisms interacted with Dual status (Appendix 7). Not surprisingly, there was a lot of multicollinearity. This collinearity occurred between the variables outsider percentage, number of directors and the dual share dummy. Leading to a mean VIF higher than 4 in the both samples.

The regression with all governance mechanism interaction terms will therefore not be evaluated. The interaction terms will be assessed independently from one another.

First, cash is used as interaction term with dual share company. The table is shown in Appendix 8. For cash the consistent negative relationship with the natural logarithm of Tobin's Q is observed as in Table 8. If the firm possesses 1 million more in cash relative to the market capitalization, Tobin's Q will decrease with again approximately 40%. The variable of interest is the interaction term between cash and dual share status, providing no strong results. There is a weak negative relation (10% level) with the interaction of cash and dual status for ROA and labour productivity in the full sample, nevertheless this relationship is insignificant in the matched sample. Therefore, hypothesis 5 is rejected.

Second, capital expenditures of the companies are used as corporate governance mechanism. The table can be seen in Appendix 9. Capital expenditures have the predicted negative relationship with the performance measures, except with labor productivity. Which seems plausible, because when a company invests in capital expenditures this could be expenditures, which result in more effective employees, therefore higher labor productivity. For instance, new machines or equipment could result in higher labor productivity. The performance measures find no evidence for an effect of capital expenditures in dual share companies. That is why hypothesis 6 is rejected.

The third governance mechanism is executive compensation. Executive compensation could have a positive or negative influence on the firm value. In hypothesis 7 is hypothesized that it has a positive relationship when combined with dual status, which is in line with the optimal contract theory. If executive compensation is viewed independently from dual status, it has a positive influence on Tobin's Q, natural logarithm of Q and labor productivity. This can be observed in table 9, this relationship is in line with the optimal contract theory.

Nonetheless, for the interaction term between executive compensation and dual share the effect is the opposite for the natural logarithm of Q and labor productivity. The effect of this interaction term on these performance measures is negative. Agreeing with the managerial power theory, suggesting that executives that have power over their own remuneration contract could lead to concerns in dual class companies.

Executive compensation has a negative effect on ROA. A million increase in executive compensation leads to 1,2% decrease in ROA in the full sample and 1,3% decrease in ROA in the matched sample. This is again in line with the managerial power theory. There is no significant relationship with dual share companies and executive compensation on ROA. In conclusion the managerial power theory is evidenced more, therefore rejecting hypothesis 7.

TABLE 9: Executive compensation as an interaction term with Dual Status

Executive compensation is in millions. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Matched sample			
	ROA	ln(Q)	Labor productivity
	(1)	(2)	(3)
Variables of interest			
Dual share status	0.050** (0.023)	-0.112*** (0.020)	-49.307* (26.783)
Executive Compensation	-0.013*** (0.002)	0.010*** (0.002)	7.529*** (2.326)
Dual share status * Executive Compensation	0.002 (0.003)	-0.007*** (0.002)	-5.895** (2.394)
Control variables			
Market leverage	-0.759*** (0.046)	-1.505*** (0.043)	-259.404*** (48.384)
R&D/sales	-0.185*** (0.039)	0.127** (0.056)	122.609*** (30.405)
Advertising/sales	-2.503*** (0.244)	1.285*** (0.249)	-1,012.962*** (259.868)
Sales growth	0.093*** (0.011)	-0.016** (0.008)	210.457*** (19.195)
ROA		0.026 (0.016)	260.518*** (50.305)
Employees	-0.001** (0.000)	0.001*** (0.000)	-7.963*** (0.800)
Pay-out ratio	1.169** (0.468)	0.380 (0.456)	-589.834 (403.803)
Age (in years)	0.002** (0.001)	-0.002*** (0.001)	-9.168*** (1177)
Regression information			
Constant	19.110*** (3.669)	-13.424*** (3.244)	-34,046.953*** (4,101.714)
Observations	4,988	4,965	4,988
R-squared	0.131	0.277	0.175

The fourth interaction term is board size and is measured as the number of directors in the board of directors. The results of this regression are presented in Appendix 11. There appears to be a lot of multicollinearity between number of directors and DSS, the VIF shows a score of around 14 for all the regressions. Hence, the regression in Appendix 11 is not taken into consideration.

It is still useful to test whether board size has an extra effect on dual status companies. Accordingly, there is a dummy created for whether a company has a big board or not. The mean and median of the number of directors is around 8, as can be seen in Table 2. Consequently, it is assumed that a company has a big board when the number of directors on the board is bigger than 8 and 0 otherwise. It seems agreeable as Jensen (1993) shows that a big board is around seven to eight directors.

In Table 10 the results are illustrated in the matched sample and Appendix 12 of the full sample. The variable *Big Board* is independently assessed and the effect on the performance measures ROA and the natural logarithm of Tobin's Q are contradicting. A big board results in a lower ROA, but in a higher Tobin's Q. The effect of a big board on the natural logarithm of Tobin's Q is offset by the interaction of the big board and dual status. Therefore, a big board still has a negative effect on a dual share company when taking ln (Tobin's Q) as a performance measure.

A big board indicates a negative relationship on ROA, significant in the full sample however not significant in the matched sample. For labor productivity there is no clear relationship with board size. Therefore, hypothesis 8 is not accepted in all cases.

TABLE 10: Big Board as an interaction term with Dual Status

A big board is a dummy variable that is 1 if the board is bigger than 8 and is 0 otherwise. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Matched sample			
	ROA (2)	ln(Q) (3)	Labor productivity (4)
Variables of interest			
Dual share status	0.032 (0.026)	-0.004 (0.026)	-33.218 (42.743)
Big board	-0.140***	0.136***	-64.961

TABLE 10 continues

	(0.026)	(0.022)	(40.876)
Dual share status * Big board	-0.021 (0.038)	-0.059* (0.035)	-69.495 (61.101)
Control variables			
Market leverage	-0.627*** (0.047)	-1.571*** (0.039)	-24.540 (77.123)
R&D/sales	-0.028***	0.031***	13.001**
TABLE 10 continued			
	(0.005)	(0.007)	(5277)
Advertising/sales	-1.353*** (0.237)	0.764*** (0.258)	-942.078*** (204.360)
Sales growth	0.095*** (0.007)	-0.021*** (0.007)	143.172*** (14.339)
ROA		-0.028** (0.014)	187.306*** (48.069)
Employees	-0.003*** (0.001)	0.002*** (0.000)	-7.461*** (0.788)
Payout ratio	0.635* (0.370)	-0.691** (0.344)	3,304.195*** (945.363)
Age (in years)	0.005*** (0.001)	-0.006*** (0.001)	-8.332*** -1.493
Regression information			
Constant	27.064*** (3.732)	-10.463*** (3.786)	-32,198.235*** (5,305.894)
Observations	5,728	5,672	5,728
R-squared	0.107	0.245	0.101

The last interaction term is outsiders in the board; the table is positioned in Appendix 13. Disappointingly, in all these regressions there was really high multicollinearity between dual share status and outsider percentage.

Following, there was a dummy created which was 1 when there are more outsiders in the board of directors than insiders and 0 otherwise. This table is included in Appendix 14. This dummy variable still resulted in multicollinearity, because the desirable variance inflation factor of maximum 4 was exceeded. Therefore, this regression is not taken into account. In this research, there is no effect evidenced for outsiders in the board of directors for a dual share company, rejecting hypothesis 10.

5.6. Summary results

In Table 11 all the results obtained are summarized. The table only describes a clear connection when the independent variable had the same relationship in the full and matched sample, by indicating positive or negative effect. No clear effect means that, either the effect is contradicting in both samples, or in one sample the effect is not significant. Hence, no clear connection could be evidenced.

It is apparent from Table 11, that the results obtained for labour productivity do not provide clear evidence for either one of the hypotheses. The independent variables are either insignificant or have different effects in the two samples.

The other two performance measures do show some clear results. In particular return on assets finds clear relationships. Dual status indicates a clear negative effect on ROA, by using OLS regressions as for the propensity score matching methods. Therefore, hypothesis 2 is accepted for ROA, showing that dual status has a negative effect on firm value.

Furthermore, the interaction of dual status and maturity shows a negative relationship on ROA and the natural logarithm of Tobin's Q. Hence, hypothesis 4 is accepted.

In this research there is no evidence found for hypothesis 3, 5, 6, & 9. Hence, these hypotheses are rejected.

TABLE 11: Summary results

This table summarizes all the results from the models previously discussed. Negative means the independent variable has a negative effect on the dependent variable (either ROA, ln (Q) or labor productivity).

Summary results			
	ROA	ln(Q)	Labor productivity
	(1)	(2)	(3)
Hypothesis 1 & 2			
Dual share status - OLS regressions	Negative	Negative	Not significant
Dual share status - PSM	Negative	Not significant	Not significant
Hypothesis 3 & 4			
Maturity * Dual share status	Negative	Negative	Not significant

TABLE 11 continued

Growth Opportunities * Dual share status	Not significant	Not significant	No clear effect
Hypothesis 5, 6, 7, 8 & 9			
Cash * Dual share status	No clear effect	No clear effect	No clear effect
Capital expenditures * Dual share status	Not significant	Not significant	No clear effect
Executive compensation * Dual share status	Not significant	Negative	No clear effect
Board size * Dual share status		Multicollinearity	
Big board * Dual share status	No clear effect	Negative	Not significant
Outsider percentage * Dual share status		Multicollinearity	
More outsiders than insiders * Dual share status		Multicollinearity	

5.7. Robustness checks

In order to assure the structural validity of the results, multiple robustness checks are performed. Additional regressions are executed with a different independent variable and the time period is split in the different years. Hence, the results presented in the previous sections will be confirmed or rejected.

5.7.1. Different independent variables

The independent variables used in this research are ROA, the natural logarithm of Tobin's Q and labour productivity. For the robustness check only the main research question will be tested, therefore the effect of dual share status on firm performance. ROA presented the most significant results for this research question. That is why it is perceived interesting to replicate the empirical framework with return on equity (ROE).

Appendix 15 & 16 provide the results obtained from the analysis of dual status on return on equity. Appendix 15 presents the OLS regressions with dual status as dependent variable on return of equity. Turning back to Table 11, the relationship between dual share status and the performance measures was either negative or insignificant.

In Appendix 15, it can be seen that the effect for the full sample is negative but insignificant and for the matched sample it surprisingly is positive and significant.

Combining these outcomes, the effect of dual share status is not clear. Appendix 16 represents the propensity score matching methods, for all three methods the effect is not significant. Furthermore, this table shows again contradicting results. The average treatment effect is positive for Nearest Neighbour matching and Radius matching yet is negative for Kernel matching. Next to that, the average treatment effects are remarkable small.

This robustness check concludes that the use of other independent variables will not change our results.

5.7.2. Different time frame

This research has been conducted in the years 1998 till 2017 for the full sample and 1999 till 2017 for the matched sample. It could be that if the years are evaluated independently assessed, the effect of dual share status on firm performance will deviate.

As ROA provides the most significant results for the effect of dual share status on firm performance, ROA will be used as independent variable for this robustness check. The effect of the different years in both samples will be tested. The years are independently evaluated; these are shown in Appendix 17 and 18. In both samples the significant coefficients for dual status are all negative, therefore confirming the relationship between dual status and ROA found in the results section. A comparison of the two samples reveals that the negative significant effect is stronger in the full sample than in the matched, which makes sense because in the matched sample the dual share companies are matched to single share companies with comparable characteristics.

Both robustness checks confirm the results attained in the previous sections.

CHAPTER 6: Discussion

6.1. Conclusion

This paper aims to provide an insight into the pros and cons of adopting a dual share structure, because literature done on the matter is contradicting. Dual share structure seems to increase in popularity, yet its effect on firm performance is questionable. The benefits of adopting a dual share structure are mainly explained by the stewardship theory. This theory claims that the founder is a unique fit for the company and is

therefore able to make the “right” corporate decisions. In a dual share structured company, the “steward” is able to make decisions focused on the long-term growth of the company, without being affected by the short-term interests of shareholders. High growth opportunities can manifest without managers being overruled by the other shareholders. Also, DSS could protect the firm from market pressures, acting as an anti-takeover provision against hostile takeovers.

Whilst examining the benefits of adopting a dual share structure, this paper also analyzes the accompanying costs. Literature has shown these mainly consist of agency costs such as executives extracting private benefits & empire building. Finally, the effect of other corporate governance mechanisms in combination with a dual share structure is assessed. Corporate governance mechanisms might prove to be more (or less) efficient in dual share structure companies than their matched single share structure counterparties.

This research shows the negative effect of dual share structure on ROA and natural logarithm of Tobin’s Q of a company. The evidence leans towards confirming the agency theory. Costs associated with the split between ownership and control are higher in a dual share company, due to the controlling shareholders holding smaller equity positions than voting positions. A result of these smaller equity positions is that the financial consequences for the actions of these managers are not that severe, resulting in higher incentives for extracting private benefits.

Kim & Michaely (2018) suggest that the benefits of dual share structure erode over time. In this research similar results are found. Maturity negatively affects firm performance (ROA and natural logarithm of Tobin’s Q) in dual share companies, therefore dual share companies should be cautious with this structure and keep in mind that the benefits of this structure do erode. A dual share company could switch to single share structure and unify their disparate shares to one single class of shares again (Pajaste, 2005). This could be done with a pre-determined sunset provision.

Table 11 shows a big board of directors (more than eight directors) results in a lower natural logarithm of Tobin’s Q for a dual share company, as was suggested in the literature review. Bigger board companies experience higher communication and coordination costs than companies with a smaller board. Especially for dual share companies, a big board is detrimental. Incorporating more opinions of stakeholders

thus enlarging information asymmetry costs, while especially the board of directors in a DSS company should monitor the executives.

Contrary to expectations, a negative effect of executive compensation in dual share companies on the natural logarithm of Tobin's Q is found. This is in line with the alternative theory; the managerial power theory. The managerial power theory suggests that disagreements arise between stakeholders, when executives have control over their own remuneration.

This research finds no significant effect of growth opportunities, cash holdings, capital expenditures and outsiders on the board on firm performance in dual share companies.

Overall, most findings are in line with previous literature. This research suggests that it is important for a company to carefully choose in which way they want to structure their share structure. Even though a lot of companies (especially tech) choose to adopt dual share structure when going public, the findings of this research suggest they should not. Performance wise, this study shows a dual share structure to be detrimental. However, it could be that the insiders of the company want to maintain a dual share structure for private benefits. Before going public, control and ownership are minimally split. After the IPO, insiders lose some of their control in a single share structure. A dual share structure would avoid such control-loss. The choice for a dual share structure could be a consequence of the insiders trying to preserve some private benefits. All together, this research is in favour of a single share structure when taken total firm performance into account.

6.2. Limitations and further research

It is plausible that a number of limitations might have influenced the results obtained. First of all, as is well known endogeneity plays a large role in ownership structure studies and these endogeneity biases are notably difficult to account for (Mausilis, Xie and Wang, 2009). In the propensity score method models, endogeneity is mostly accounted for, making the matched sample more reliable. However, multivariate OLS regressions could be influenced by endogeneity, especially in the full sample.

Other sources for possible errors lie within the data and methodology. The approach of identifying dual share companies of Gompers, Ishii and Metrick (2009) was followed. However, the assumption was made that if A) shares outstanding in CRSP and

Compustat differed by more than 5% and B) the company was listed by either Jay Ritter, Andrew Metrick or Gompers, Ishii and Metrick (2009) as dual share company, the company possessed a dual share structure. Overcoming this assumption can be done by manually checking annual reports of DSS companies for their actual shareholder structure. Another limitation regarding data is the oversimplification of certain variables. For example: growth opportunities are measured as book value of equity over the market value of equity. Growth opportunities however, are affected by many factors such as maturity, industry, capital constraints and others. The simplification of these variables could lead to discrepancies in some relationships presented in this research. Further work can be done on measuring these variables in different ways to more accurately estimate their effects on firm performance. This could possibly resolve the rather low R-squared, that demonstrates that the models used in this research do not possess enough explanatory power over the dependent variables.

This study only investigates the relationship of dual share structure on firm performance in the United States. Consequently, to conclude the same results for other countries, this research should be replicated in different countries. This could lead to interesting insights, due to high levels of investor protection in the US in relation to others. If the research is done in a country with less investor protection, it could possibly lead to contradicting results.

Despite these limitations, this study adds to the understanding of dual share companies and its effect of it on performance. The present study lays groundwork for future research into the relation of maturity on firm performance in dual share companies. This research concludes that when maturity increases, firm performance decreases in dual share companies. However, there is incentive for additional research to explore this relationship further. Future research should examine when the benefits of dual share companies erode and whether this company should unify its shares. This would act as an incentive for efficient sunset provisions.

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Appendix

Appendix 1: Variables explanation

This table describes the variables used in this research, from which database the variables are taken and some variables on which research they are inspired.

Variable	Description	Database	Inspired on research
Advertising/Sales	Advertising Expenses scaled by lagged book assets in millions \$ divided by total sales	Compustat	Gompers, Ishii & Metrick (2009)
Age	Age in years since IPO	First listing in CRSP, Compustat or from Jay Ritter's database	Kim & Michaely (2018)
Asset Tangibility	Net Property Plant & Equipment scaled by total book assets	Compustat	Kim & Michaely (2018)
Asset Uniqueness R&D	Total Research and Development Expenses divided by book assets	Compustat	
Assets	Total book assets in millions \$	Compustat	
Big board	Dummy which is 1 if the board of director is bigger than 8 directors, 0 otherwise	BoardComp	
Board size	Number of directors on the board of directors	BoardComp	
Capex/Assets	Capital expenditures scaled by lagged book assets	Compustat	Kim & Michaely (2018)
Capital expenditures	Capital expenditures relative to market capitalization	Compustat	
Cash	Cash relative to market capitalization	Compustat	
Dividend yield	Total dividends divided by market capitalization	Compustat	
Employees	Amount of employees in millions \$	Compustat	
Executive Compensation	Total Compensation (Salary + Bonus + Other Annual Grants + Long Term Incentive plan) in millions \$	ExecuComp	
Growth Opportunities	Book equity divided by Market equity	Compustat	Amoako-Adu, et al. 2011
Labor productivity	Net income divided by lagged employees times working hours (2.078 working hours based on full time)	Compustat	
ln (Q)	Natural logarithm of Tobin's Q	Compustat	Gompers, Ishii & Metrick (2009)
Market capitalization	Common shares outstanding times annual closed stock price	Compustat	
Market leverage	Total debt divided by the sum of total debt and market equity	Compustat	Kim & Michaely (2018)
Mature	Dummy which is 1 if the the company is older than 11 years since IPO, 0 otherwise	Compustat	Kim & Michaely (2018)
Media Firm	Dummy which is 1 if when its' SIC code is 2710, 2711, 2730, 2731, 4830, 4832, 4833, 4840, 4841, 7810, 7812 or 7820, 0 otherwise	Compustat, CRSP or Jay Ritter	
Outside over Inside	Dummy which is 1 if there are more outsiders on the board than insiders on the board, 0 otherwise.	BoardComp	
Outsider percentage	Percentage of outsiders on the board of directors	BoardComp	
Pay-out ratio	Total pay-out including dividends and repurchases divided by market equity	Compustat	Kim & Michaely (2018)
R&D	Research and Development Expenses scaled by lagged book assets in millions \$	Compustat	Kim & Michaely (2018)

Appendix 1 continued

R&D/Sales	Research and Development Expenses in millions \$ divided by total sales	Compustat	Gompers, Ishii & Metrick (2009)
Revenue Growth	Revenue divided by lagged revenues	Compustat	
ROA	Net income over total book assets	Compustat	
Sales growth	First difference of the natural log of sales	Compustat	Kim & Michaely (2018)
Size (log assets)	Natural log of total book assets	Compustat	
Size (log market capitalization)	Natural log of total market capitalization	Compustat	
Tobin's Q	(Total book assets + market equity - book equity - deferred taxes) divided by total book assets	Compustat	Gompers, Ishii & Metrick (2009)
Δ Log (Sales)	The change in the natural logarithm of sales from t to t-1 per company	Compustat	
Δ ROA	The change in ROA from t to t-1 per company	Compustat	
Δ Size	The change in log assets from t to t-1 per company	Compustat	

Appendix 2: Correlation matrix performance measures

The correlations between the performance measures used as independent variables in this research are presented in this table.

	ROA	ln (Tobin's Q)	Labor productivity
ROA	1		
ln (Tobin's Q)	-0,0166	1	
Labor productivity	-0,0120	-0,0259	1

Appendix 3: Correlation matrix governance mechanisms

The correlations between the governance mechanisms which are used as dependent variables and as interactions terms with dual status are shown in this correlation matrix.

	Cash	Capital Expenditures	Executive Compensation	Board size	Outsider Percentage
Cash	1				
Capital Expenditures	0,4185	1			
Executive Compensation	-0,0091	-0,0096	1		
Board size	-0,0595	-0,0595	0,2307	1	
Outsider Percentage	0,0038	0,0120	0,0915	0,2373	1

Appendix 4: Dual Status and Maturity as an interaction term for the full sample

Maturity is measured when the company is older than the mean of 11. The effect of maturity and the effect of DSS are independently of each other assessed and as an interaction term. This table is the regression in the full sample. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

	Full sample					
	ROA		ln(Q)		Labor productivity	
	(1)	(2)	(3)	(4)	(5)	(6)
Variables of interest						
Dual share status	-0.044*** (0.007)	-0.106*** (0.008)	-0.006 (0.011)	0.004 (0.011)	-83.779 (129.137)	-30.847 (129.296)
Mature company	-0.025*** (0.004)	0.006 (0.005)	-0.055*** (0.006)	-0.069*** (0.006)	-329.748*** (37.634)	-396.615*** (41.953)
Dual share status * Mature company	-0.033*** (0.010)	-0.035*** (0.012)	-0.107*** (0.016)	-0.116*** (0.016)	27.743 (132.318)	-19.003 (132.785)
Control variables						
Size (log assets)	-0.622*** (0.004)		0.132*** (0.006)		673.697*** -56.896	
Market leverage	-0.027*** (0.009)	-1.286*** (0.013)	-1.434*** (0.012)	-1.401*** (0.012)	649.013*** (139.804)	818.766*** (151.777)
R&D/sales	0.038*** (0.002)	0.020*** (0.001)	0.011*** (0.002)	0.022*** (0.002)	-69.958*** (6.286)	-18.146*** (2.081)
Advertising/sales	0.237*** (0.067)	0.157** (0.067)	0.540*** (0.117)	0.632*** (0.115)	-2,200.640*** (271.986)	-1,715.155*** (234.783)
Asset tangibility	-0.030*** (0.004)	-0.022*** (0.005)	-0.098*** (0.007)	-0.110*** (0.007)	305.280*** (43.045)	243.867*** (40.355)
Sales growth	0.588*** (0.004)	0.370*** (0.003)	-0.121*** (0.006)	-0.005*** (0.002)	-520.435*** (49.873)	69.860*** (5.769)
ROA			0.093*** (0.007)	-0.023*** (0.004)	539.617*** (32.718)	-46670 (29.993)
Employees	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	-11.582*** (0.753)	-8.761*** (0.565)
Payout ratio	0.013 (0.073)	-0.648*** (0.089)	-0.593*** (0.123)	-0.620*** (0.122)	11,027.186*** (2,018.649)	10,821.446*** (2,013.725)
Size (log market capitalization)		-0.349*** (0.002)				
TABLE 7 continued						
Regression information						
Constant	9.427*** (0.648)	18.053*** (0.761)	-5.031*** (1.027)	-6.478*** (1.029)	-58,516.291*** (6,162.685)	-65,920.693*** (6,504.442)
Observations	78,556	78,556	77,423	77,423	78,556	78,556
R-squared	0.601	0.447	0.190	0.182	0.016	0.011

Appendix 5: Growth opportunities as an interaction term with Dual Status

Growth opportunities are measured as the book equity to market equity. The effect of growth opportunities and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample						Matched sample					
	ROA		ln(Q)		Labor productivity		ROA		ln(Q)		Labor productivity	
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Variables of interest												
Dual share status	-0.048*** (0.008)	-0.093*** (0.010)	-0.023 (0.015)	-0.020 (0.015)	4.564 (96.858)	30.321 (97.042)	-0.014 (0.012)	-0.043*** (0.016)	0.032 (0.022)	0.035 (0.022)	-59.093*** (17.177)	-51.056*** (17.487)
Growth opportunities	-0.023*** (0.003)	-0.237*** (0.006)	-0.756*** (0.008)	-0.760*** (0.008)	186.042*** (41.188)	383.061*** (53.840)	-0.033*** (0.009)	-0.226*** (0.016)	-0.705*** (0.023)	-0.709*** (0.023)	30.064*** (9.156)	120.439*** (12.515)
Dual share status * Growth opportunities	-0.014 (0.009)	-0.010 (0.012)	0.032 (0.023)	0.032 (0.023)	-199.305*** (70.503)	-206.138*** (71.090)	-0.014 (0.013)	-0.020 (0.020)	-0.021 (0.034)	-0.023 (0.034)	-24.296* (14.226)	-21.889 (14.986)
Control variables												
Size (log assets)	-0.623*** (0.004)		0.052*** (0.004)		687.383*** (58.781)	1,652.388**	-0.637*** (0.010)		0.053*** (0.012)		334.422*** (24.551)	
Market leverage	-0.010 (0.009)	-1.250*** (0.013)	-0.847*** (0.013)	-0.831*** (0.013)	515.660*** (128.412)	* (221.395)	-0.015 (0.021)	-1.292*** (0.029)	-0.834*** (0.030)	-0.821*** (0.030)	-151.479*** (38.479)	430.745*** (57.004)
R&D/sales	0.038*** (0.002)	0.022*** (0.001)	0.004*** (0.001)	0.009*** (0.001)	-67.233*** (6.053)	-47.174*** (4.626)	0.034*** (0.004)	0.020*** (0.003)	0.012*** (0.004)	0.016*** (0.004)	-19.894*** (2.613)	-12.791*** (2.120)
Advertising/sales	0.237*** (0.067)	0.221*** (0.062)	0.614*** (0.072)	0.651*** (0.071)	-2,205.125*** (273.958)	* (270.998)	-0.653*** (0.115)	-0.497*** (0.123)	0.450*** (0.135)	0.432*** (0.134)	-227.954* (116.745)	-390.149*** (123.853)
Asset tangibility	-0.030*** (0.004)	-0.034*** (0.005)	-0.095*** (0.005)	-0.100*** (0.005)	308.031*** (43.112)	309.471*** (43.180)	-0.071*** (0.009)	-0.067*** (0.010)	-0.079*** (0.010)	-0.084*** (0.010)	18.759 (18.268)	13.229 (18.388)
Sales growth	0.589*** (0.004)	0.405*** (0.003)	-0.082*** (0.004)	-0.036*** (0.001)	-518.520*** (50.507)	-242.498*** (31.086)	0.599*** (0.011)	0.402*** (0.007)	-0.077*** (0.012)	-0.029*** (0.003)	-203.779*** (20.912)	-76.022*** (10.633)
ROA			0.057*** (0.005)	0.011*** (0.003)	546.262*** (33.419)	331.883*** (23.229)			0.083*** (0.014)	0.033*** (0.008)	473.480*** (41.988)	371.107*** (34.493)
Employees	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	-10.875*** (0.714)	-10.315*** (0.683)	0.000 (0.000)	-0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)	-5.614*** (0.353)	-5.602*** (0.340)
Payout ratio	0.018 (0.074)	-0.947*** (0.100)	0.027 (0.127)	0.023 (0.128)	11,466.441** (2,048.227)	12,388.227* (2,113.980)	-0.116 (0.138)	-0.887*** (0.190)	-0.789*** (0.203)	-0.791*** (0.204)	1,352.698*** (362.149)	1,709.027*** (364.395)

Age (in years)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-15.228*** (1.399)	-15.790*** (1.442)	0.000 (0.000)	0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-4.510*** (0.816)	-4.926*** (0.828)			
Size (log market capitalization)		-0.400*** (0.003)				373.403*** (35.241)		-0.406*** (0.007)				191.439*** (12.062)			
Regression information															
Constant	9.712*** (0.645)	17.945*** (0.736)	1.676** (0.751)	1.162 (0.753)	-	60,615.549** * (6,121.585)	-	65,124.599* ** (6,319.325)	7.700*** (1.488)	12.095*** (1.746)	-5.021*** (1.749)	-5.402*** (1.754)	-27,355.729*** (3,200.939)	-	27,614.175** * (3,216.526)
Observations	78,542	78,542	77,423	77,423	78,542	78,542	13,428	13,428	13,25	13,25	13,428	13,428			
R-squared	0.601	0.487	0.579	0.577	0.017	0.015	0.622	0.485	0.588	0.587	0.133	0.126			

Appendix 6: Governance mechanisms causal effect on performance

This table shows the OLS regression of the variables which are used as governance mechanisms; cash, capital expenditures, outsider percentage, executive compensation and board size. Cash is measured as total cash divided by market capitalization, capital expenditures in the same way. Outsider percentage is the amount of outsiders divided by the total number of directors. Executive compensation is the total salary the CEO receives. Board size is the number of directors on the board. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Full sample			
	ROA (1)	Ln (Q) (2)	Labor productivity (3)
Variables of interest			
Dual share status	-0.021 (0.019)	-0.124*** (0.016)	-65.926** -26.058
Cash	0.051*** (0.019)	-0.429*** (0.100)	-154.662*** (54.936)
Capital expenditures	-0.006 (0.026)	-0.333*** (0.063)	652.415*** (137.627)
Outsider percentage	-0.132*** (0.018)	-0.003 (0.016)	-117.262*** (19.013)
Executive compensation	-0.020*** (0.003)	0.011*** (0.001)	7.606*** (1.513)
Board size	-0.037*** (0.003)	0.011*** (0.002)	-30.181*** (5.752)
Control variables			
Market leverage	-0.756*** (0.029)	-1.431*** (0.040)	-117.750** (52.133)
Advertising/sales	-0.095*** (0.020)	0.096*** (0.019)	13305 (10.587)
Asset tangibility	-0.176 (0.178)	1.307*** (0.152)	201.075 (218.502)
Sales growth	0.197*** (0.007)	-0.032*** (0.005)	132.978*** (11.587)
ROA		0.034*** (0.007)	175.460*** (22.951)
Employees	-0.001*** (0.000)	0.002*** (0.000)	-6.361*** (0.394)
Payout ratio	1.638*** (0.225)	0.855*** (0.292)	1,681.065 (1,388.813)
Age (in years)	-0.000 (0.000)	-0.003*** (0.000)	-8.551*** (0.573)
Regression information			
Constant	21.516*** (1.978)	-3.511** (1.694)	-33,351.803*** (2,504.370)
Observations	21,535	21,453	21,535
R-squared	0.174	0.312	0.070

Appendix 7: Governance mechanisms and Dual Status as interaction terms

In this regression all governance mechanisms are interacted with dual status. Cash and capital expenditures are measured relatively to market capitalization. Outsider percentage is the amount of outside directors divided by the total directors. Executive compensation is the total salary of the executive in millions. Board size is the amount of directors on the board. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (2)	ln(Q) (3)	Labor productivity (4)	ROA (2)	ln(Q) (3)	Labor productivity (4)
Variables of interest						
Dual share status	0.395*** (0.094)	-0.060 (0.082)	-452.018*** (91.516)	0.235** (0.120)	-0.221** (0.106)	-433.256*** (149.693)
Cash	0.068*** (0.020)	-0.436*** (0.105)	-184.247*** (55.925)	0.085 (0.061)	-0.592*** (0.195)	96143 (121.655)
Dual share status * Cash	-0.289*** (0.074)	0.117 (0.156)	558.816*** (100.047)	0.441*** (0.107)	0.025 (0.221)	719.182*** (194.184)
Capital expenditures	-0.026 (0.027)	-0.330*** (0.064)	672.509*** (142.362)	-0.038 (0.063)	0.035 (0.086)	366.552** (167.428)
Dual share status * capital expenditures	0.362*** (0.108)	0.040 (0.258)	-36.325 (256.526)	0.463*** (0.134)	-0.146 (0.278)	590.797* (304.461)
Outsider percentage	-0.135*** (0.019)	-0.009 (0.016)	-129.004*** (19.675)	-0.115** (0.058)	-0.012 (0.050)	-69.684 (53.521)
Dual shares status * outsider percentage	0.037 (0.069)	0.083 (0.075)	162.823*** (46.681)	-0.034 (0.092)	-0.018 (0.096)	204.557*** (77.149)
Executive compensation	-0.020*** (0.004)	0.011*** (0.002)	7.676*** (1.633)	0.017*** (0.004)	0.007*** (0.002)	8.913** (3.882)
Dual share status * Executive compensation	0.005 (0.004)	-0.005** (0.002)	-1.556 (3.204)	0.004 (0.004)	0.000 (0.003)	-5.824 (4.347)
Board size	-0.033*** (0.003)	0.012*** (0.002)	-31.343*** (6.047)	0.032*** (0.008)	-0.003 (0.006)	-28.421*** (10.664)
Dual share status * Board size	-0.756*** (0.029)	-1.434*** (0.039)	-126.284** (52.254)	-0.013 (0.012)	0.013 (0.009)	6.953 (11.067)
Control variables						
Market leverage	-0.756*** (0.029)	-1.434*** (0.039)	-126.284** (52.254)	0.920*** (0.067)	-1.451*** (0.063)	-428.342*** (89.719)
R&D/Sales	-0.095*** (0.020)	0.096*** (0.019)	14183 (10.655)	0.247*** (0.066)	0.302* (0.157)	216.660*** (60.887)
Advertising/sales	-0.106 (0.177)	1.327*** (0.152)	152845 (220.701)	1.772*** (0.303)	1.765*** (0.289)	-754.159*** (271.997)
Sales growth	0.196*** (0.007)	-0.032*** (0.005)	133.814*** (11.634)	0.135*** (0.017)	-0.037*** (0.011)	276.415*** (36.902)
ROA		0.034*** (0.007)	176.723*** (22.975)		0.033* (0.020)	306.887*** (76.550)
Employees	-0.001***	0.002***	-6.379***	-0.001	0.002***	-9.640***

**Appendix 7
continued**

	(0.000)	(0.000)	(0.395)	(0.001)	(0.000)	(1.275)
Payout ratio	1.631***	0.875***	1,710.707	0.764	0.295	-641.416
	(0.226)	(0.290)	(1,386.492)	(0.543)	(0.501)	(592.793)
Age (in years)	-0.000	-0.003***	-8.541***	0.001	-0.002***	-8.994***
	(0.000)	(0.000)	(0.570)	(0.001)	(0.001)	(1.687)
Regression information						
Constant	21.310***	-3.631**	-33,296.922***	11.581* *	-8.666*	-23,493.590***
	(1.969)	(1.696)	(2,491.475)	(5.092)	(4.422)	(5,845.482)
Observations	21,535	21,453	21,535	2,887	2,873	2,887
R-squared	0.176	0.313	0.070	0.170	0.346	0.185

Appendix 8: Cash and Dual Status as interaction term

Cash is measured as total cash divided by market capitalization. The effect of cash and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (1)	ln(Q) (2)	Labor productivity (3)	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest						
Dual share status	-0.184*** (0.008)	-0.078*** (0.022)	-30583 (91.405)	-0.084*** (0.014)	-0.079*** (0.027)	-69.622*** (15247)
Cash	0.011 (0.008)	-0.490*** (0.047)	-140.879*** (27.787)	-0.015 (0.021)	-0.530*** (0.072)	-43.262*** (14510)
Dual share status * Cash	-0.028* (0.015)	0.177 (0.127)	-162.228* (98.015)	-0.037 (0.031)	0.250* (0.147)	30489 (18793)
Control variables						
Market leverage	-0.381*** (0.014)	-1.308*** (0.015)	982.795*** (164.670)	-0.373*** (0.030)	-1.174*** (0.032)	-79.963** (39793)
R&D/Sales	-0.022*** (0.001)	0.024*** (0.002)	-20.775*** (2.320)	-0.031*** (0.004)	0.033*** (0.005)	5.209** (2288)
Advertising/sales	-0.538*** (0.071)	0.884*** (0.102)	-1,817.360*** (243.570)	-1.119*** (0.154)	1.021*** (0.197)	-277.698** (113903)
Sales growth	0.095*** (0.002)	-0.014*** (0.002)	75.466*** (6.014)	0.050*** (0.004)	-0.008* (0.005)	99.758*** (5886)
ROA		-0.024*** (0.004)	-43388 (30.041)		-0.000 (0.011)	166.748*** (27219)
Employees	-0.002*** (0.000)	0.003*** (0.000)	-7.872*** (0.526)	-0.003*** (0.000)	0.001*** (0.000)	-5.013*** (0.340)
Payout ratio	0.478***	-0.355***	11,576.858***	0.013	-0.644**	1,296.139***

Appendix 8 continued

Appendix 8 continued

	(0.098)	(0.133)	(2,067.445)	(0.192)	(0.254)	(358845)
Age (in years)	0.003*** (0.000)	-0.004*** (0.000)	-17.468*** (1.560)	0.007*** (0.001)	-0.004*** (0.001)	-6.145*** (0.881)
Regression information						
Constant	37.409*** (0.932)	-9.371*** (1.028)	-68,627.832*** (6,548.310)	30.834*** (2.203)	13.652*** (2.463)	-31,313.951*** (3,446.377)
Observations	77,99	76,864	77,99	13,291	13,114	13,291
R-squared	0.132	0.218	0.011	0.092	0.210	0.096

Appendix 9: Capital expenditures and Dual Status as an interaction term

Capital expenditures is measured as total capital expenditures divided by market capitalization. The effect of capital expenditures and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (1)	ln(Q) (2)	Labor productivity (3)	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest						
Dual share status	-0.187*** (0.008)	-0.052*** (0.013)	-13492 (84.090)	-0.092*** (0.013)	-0.029* (0.018)	-64.001*** (14.456)
Capital expenditures	-0.015*** (0.006)	-0.246*** (0.042)	313.384** (137.331)	-0.020 (0.017)	-0.148*** (0.053)	49.038* (26.908)
Dual share status * Capital expenditures	-0.014 (0.016)	-0.000 (0.092)	-388.935* (202.659)	0.017 (0.028)	-0.103 (0.124)	2834 (49.294)
Control variables						
Market leverage	-0.363*** (0.014)	-1.327*** (0.022)	783.157*** (158.748)	-0.367*** (0.031)	-1.209*** (0.042)	-119.834*** (40.433)
R&D/Sales	-0.023*** (0.001)	0.023*** (0.002)	-19.749*** (2.351)	-0.031*** (0.004)	0.033*** (0.005)	5.398** (2.272)
Advertising/sales	-0.531*** (0.071)	0.715*** (0.114)	-1,873.814*** (249.533)	-1.093*** (0.152)	0.865*** (0.212)	-307.589*** (113.946)
Sales growth	0.094*** (0.002)	-0.006*** (0.002)	79.688*** (6.106)	0.050*** (0.004)	0.000 (0.004)	100.097*** (5.782)
ROA		-0.025*** (0.004)	-41312 (29.940)		0.003 (0.011)	167.700*** (27.114)
Employees	-0.002*** (0.000)	0.003*** (0.000)	-7.886*** (0.521)	-0.003*** (0.000)	0.001*** (0.000)	-4.989*** (0.334)
Payout ratio	0.490*** (0.099)	-0.442*** (0.129)	10,999.606*** (2,082.944)	-0.022 (0.192)	-0.754*** (0.246)	1,216.977*** (360.869)

Appendix 9 continued

Age (in years)	0.003*** (0.000)	-0.004*** (0.000)	-16.725*** (1.515)	0.007*** (0.001)	-0.003*** (0.001)	-5.970*** (0.869)
Regression information						
Constant	37.271*** (0.929)	-6.425*** (1.029)	-67,711.727*** (6,373.494)	31.252*** (2.177)	10.582*** (2.474)	-30,823.659*** (3,378.709)
Observations	78,179	77,053	78,179	13,428	13,25	13,428
R-squared	0.130	0.186	0.011	0.090	0.181	0.095

Appendix 10: Board Executive compensation as an interaction term with Dual Status

Executive compensation is in millions. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Full sample			
	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest			
Dual share status	-0.050** (0.021)	-0.093*** (0.016)	-27.776* (16.832)
Executive Compensation	-0.012*** (0.003)	0.007*** (0.002)	5.526*** (1.483)
Dual share status * Executive Compensation	-0.003 (0.003)	-0.004** (0.002)	-0.878 (1.593)
Control variables			
Market leverage	-0.636*** (0.020)	-1.694*** (0.018)	-4991 (30.151)
R&D/sales	-0.051*** (0.016)	0.057*** (0.016)	1363 (4.606)
Advertising/sales	-0.453*** (0.131)	1.190*** (0.134)	-460.127*** (146.888)
Sales growth	0.148*** (0.005)	-0.002 (0.004)	100.409*** (7.721)
ROA		0.012** (0.006)	141.792*** (14.680)
Employees	-0.001*** (0.000)	0.002*** (0.000)	-5.970*** (0.269)
Pay-out ratio	1.547*** (0.178)	-0.270 (0.200)	646.216 (747.016)
Age (in years)	-0.001** (0.000)	-0.002*** (0.000)	-8.565*** (0.433)

**Appendix 10
continued**

**Regression
information**

Constant	28.041*** (1.343)	0.164 (1.182)	-38,522.842*** (2,074.010)
Observations	37,118	36,947	37,118
R-squared	0.138	0.281	0.073

Appendix 11: Board size as an interaction term with Dual Status

Board size is measured as the amount of directors on the board. Board size and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (1)	ln(Q) (2)	Labor productivity (3)	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest						
Dual share status	0.064 (0.049)	0.210*** (0.047)	-13.705 (203.914)	0.039 (0.067)	0.124* (0.065)	37.932 (71.681)
Board size	-0.055*** (0.002)	0.034*** (0.002)	-17.857*** (4.334)	-0.053*** (0.006)	0.033*** (0.005)	-8.562 (7.592)
Dual share status * Board size	-0.014*** (0.005)	-0.031*** (0.005)	6.464 (25.447)	-0.002 (0.008)	-0.018*** (0.007)	-12.151 (7.755)
Control variables						
Market leverage	-0.531*** (0.020)	-1.575*** (0.017)	152.121*** (54.252)	-0.629*** (0.047)	-1.564*** (0.039)	-33.254 (76.490)
R&D/Sales	-0.014*** (0.001)	0.014*** (0.002)	-3.776** (1.644)	-0.026*** (0.005)	0.031*** (0.007)	12.451** (5.063)
Advertising/sales	-0.273** (0.120)	1.367*** (0.135)	-670.907*** (181.246)	-1.120*** (0.234)	0.705*** (0.258)	-911.982*** (205.282)
Sales growth	0.134*** (0.003)	-0.030*** (0.003)	104.837*** (6.561)	0.111*** (0.007)	-0.024*** (0.007)	141.393*** (13.881)
ROA		-0.024*** (0.005)	147.658*** (26.756)		-0.024* (0.014)	186.807*** (48.632)
Employees	-0.001*** (0.000)	0.003*** (0.000)	-6.604*** (0.333)	-0.003*** (0.001)	0.002*** (0.000)	-7.387*** (0.778)
Payout ratio	1.453*** (0.162)	-0.277 (0.181)	3,158.800*** (688.418)	0.649* (0.367)	-0.685** (0.346)	3,289.383*** (943.077)
Age (in years)	0.003***	-0.006***	-10.370***	0.005***	-0.006***	-8.374***

**Appendix 11
continued**

	(0.000)	(0.000)	(0.971)	(0.001)	(0.001)	(1.488)
Regression information						
Constant	33.178*** (1.507)	-8.553*** (1.504)	-37,678.867*** (4,133.985)	31.125*** (3.738)	-11.741*** (3.836)	-32,120.652*** (5,431.361)
Observations	38,733	38,373	38,733	5,728	5,672	5,728
R-squared	0.158	0.225	0.040	0.120	0.245	0.100

Appendix 12: Big Board as an interaction term with Dual Status

A big board is a dummy variable that is 1 if the board is bigger than 8 and is 0 otherwise. The robust standard errors are the numbers in parentheses and the significance is shown with the significance is shown with *, **, *** at 10%, 5% and 1% levels.

Full sample			
	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest			
Dual share status	-0.036* (0.019)	-0.007 (0.019)	67.979 (76.281)
Big board	-0.143*** (0.008)	0.111*** (0.008)	-102.707*** (19.518)
Dual share status * Big board	-0.062** (0.027)	-0.091*** (0.026)	-64.924 (109.719)
Control variables			
Market leverage	-0.530*** (0.020)	-1.580*** (0.017)	158.087*** (53.832)
R&D/sales	-0.016*** (0.001)	0.015*** (0.002)	-3.483* (1.800)
Advertising/sales	-0.414*** (0.121)	1.408*** (0.135)	-651.035*** (169.722)
Sales growth	0.120*** (0.002)	-0.023*** (0.003)	106.297*** (7.326)
ROA		-0.031*** (0.005)	148.212*** (25.918)
Employees	-0.002*** (0.000)	0.004*** (0.000)	-6.741*** (0.321)
Payout ratio	1.469*** (0.163)	-0.280 (0.180)	3,172.845*** (688.703)
Age (in years)	0.002***	-0.006***	-10.296***

TABLE 10 continued

Appendix 11 continued

	(0.000)	(0.000)	(0.935)
Regression information			
Constant	29.028*** (1.511)	-6.206*** (1.485)	-38,200.254*** (4,054.407)
Observations	38,733	38,373	38,733
R-squared	0.146	0.222	0.040

Appendix 13: Outsider Percentage and Dual Status as an interaction term

Outsider percentage is measured as the amount of outside directors scaled by the total amount of directors. Outsider percentage and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (1)	ln(Q) (2)	Labor productivity (3)	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest						
Dual share status	-0.062 (0.047)	-0.103** (0.050)	28.817 (72.826)	-0.067 (0.064)	-0.021 (0.065)	-96.639 (72.298)
Outsider percentage	-0.196*** (0.015)	0.001 (0.016)	-93.818*** (16.499)	-0.288*** (0.045)	0.046 (0.041)	-103.661** (43.157)
Dual share status * Outsider percentage	-0.007 (0.052)	0.066 (0.058)	10.362 (70.363)	0.091 (0.070)	-0.004 (0.074)	33.188 (63.361)
Control variables						
Market leverage	-0.530*** (0.020)	-1.573*** (0.017)	156.955*** (54.650)	-0.621*** (0.047)	-1.566*** (0.039)	-27.052 (77.091)
R&D/Sales	-0.018*** (0.001)	0.017*** (0.002)	-4.870*** (1.648)	-0.029*** (0.006)	0.032*** (0.007)	11.926** (4.964)
Advertising/sales	-0.523*** (0.122)	1.474*** (0.135)	-733.233*** (173.117)	-1.454*** (0.242)	0.820*** (0.259)	-1,008.279*** (209.683)
Sales growth	0.106*** (0.002)	-0.013*** (0.002)	95.773*** (6.191)	0.079*** (0.006)	-0.009 (0.006)	132.868*** (12.098)
ROA		-0.036*** (0.005)	152.143*** (26.485)		-0.033** (0.014)	189.710*** (48.775)
Employees	-0.002*** (0.000)	0.004*** (0.000)	-6.809*** (0.337)	-0.003*** (0.001)	0.002*** (0.000)	-7.277*** (0.771)
Payout ratio	1.469*** (0.162)	-0.259 (0.180)	3,160.812*** (687.972)	0.714* (0.365)	-0.681** (0.344)	3,317.667*** (947.282)
Age (in years)	0.002*** (0.000)	-0.006*** (0.000)	-10.663*** (0.969)	0.004*** (0.001)	-0.006*** (0.001)	-8.505*** (1.495)
Regression information						
Constant	25.137*** (1.515)	-4.712*** (1.483)	-40,621.203*** (4,216.073)	21.886*** (3.755)	-8.116** (3.782)	-34,829.173*** (5,707.001)
Observations	38,733	38,373	38,733	5,728	5,672	5,728
R-squared	0.142	0.218	0.039	0.107	0.241	0.100

Appendix 14: Outside board and Dual Status as interaction term

Outside board is a dummy, which is 1 if there are more outsiders in the board than insiders, 0 otherwise. Outside board and the effect of DSS are independently of each other assessed and as an interaction term. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample			Matched sample		
	ROA (1)	ln(Q) (2)	Labor productivity (3)	ROA (1)	ln(Q) (2)	Labor productivity (3)
Variables of interest						
Dual share status	-0.133** (0.054)	-0.042 (0.064)	-56.880 (53.875)	-0.255** (0.107)	-0.111 (0.117)	18.832 (85.587)
Outsider board	-0.109*** (0.027)	-0.015 (0.027)	-10.153 (26.809)	-0.336*** (0.093)	-0.051 (0.094)	68.276 (64.289)
Dual share status * Outsider board	0.069 (0.056)	-0.007 (0.065)	101.842 (79.627)	0.276** (0.109)	0.088 (0.118)	-86.807 (90.450)
Control variables						
Market leverage	-0.546*** (0.020)	-1.573*** (0.017)	151.770*** (54.539)	-0.645*** (0.047)	-1.561*** (0.039)	-34.328 (77.019)
R&D/Sales	-0.019*** (0.001)	0.017*** (0.002)	-5.324*** (1.664)	-0.030*** (0.006)	0.032*** (0.007)	11.260** (4.863)
Advertising/sales	-0.549*** (0.122)	1.470*** (0.135)	-734.241*** (172.700)	-1.448*** (0.241)	0.815*** (0.258)	-1,000.608*** (208.617)
Sales growth	0.107*** (0.002)	-0.013*** (0.002)	95.364*** (6.211)	0.081*** (0.006)	-0.009 (0.006)	132.276*** (12.062)
ROA		-0.036*** (0.005)	154.334*** (26.388)		-0.034** (0.014)	193.448*** (49.106)
Employees	-0.002*** (0.000)	0.004*** (0.000)	-6.868*** (0.336)	-0.003*** (0.001)	0.002*** (0.000)	-7.347*** (0.776)
Payout ratio	1.433*** (0.163)	-0.259 (0.180)	3,144.107*** (687.946)	0.587 (0.372)	-0.658* (0.342)	3,267.818*** (943.572)
Age (in years)	0.002*** (0.000)	-0.006*** (0.000)	-10.646*** (0.968)	0.005*** (0.001)	-0.006*** (0.001)	-8.493*** (1.492)
Regression information						
Constant	26.880*** (1.515)	-4.825*** (1.485)	-39,681.107*** (4,221.354)	24.432*** (3.728)	-8.401** (3.796)	-34,033.487*** (5,530.028)
Observations	38,734	38,374	38,734	5,728	5,672	5,728
R-squared	0.139	0.218	0.039	0.102	0.240	0.100

Appendix 15: Robustness check ROE with OLS regression

This robustness check, checks the relationship between Dual Share Status and Return on Equity, testing with a OLS regression. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Full sample	Matched sample
	ROE	ROE
	(1)	(2)
Variables of interest		
Dual share status	-0.006 (0.048)	0.174** (0.082)
Control variables		
Size (log assets)	0.098*** (0.010)	0.092*** (0.022)
Market leverage	3.123*** (0.134)	3.506*** (0.315)
R&D/Sales	0.034*** (0.002)	0.036*** (0.006)
Advertising/sales	-0.865** (0.437)	-0.916 (1.032)
Sales growth	-0.403*** (0.042)	-0.496*** (0.101)
ROA	2.731*** (0.034)	2.743*** (0.106)
Employees	0.006*** (0.001)	0.003** (0.001)
Payout ratio	-1257 (0.908)	1242 (2.325)
Age (in years)	-0.005*** (0.001)	0.003 (0.004)
Regression information		
Constant	7800 (6.380)	19567 (16.970)
Observations	78,539	13,428
R-squared	0.210	0.173

Appendix 16: Robustness check ROE with PSM

This robustness check, checks the relationship between Dual Share Status and Return on Equity, testing with a Propensity Score Matching. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	Treatment group	Control group	Average treatment effect	T-statistic	N on support
Nearest Neighbour matching					
ROE	2,4260	2,3997	0,0263 (0,0964)	0,27	13.580
Kernel matching					
ROE	2,4260	2,4331	-0,0071 (0,0799)	-0,09	13.580
Radius matching					
ROE	2,4260	2,4203	0,0057 (0,07969)	0,07	13.580

Appendix 17: Robustness check years for full sample

This robustness check, checks the different years used in the full sample, testing with an OLS regression. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	ROA								
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Variables of interest									
Dual share status	-0.120 (0.076)	-0.133*** (0.026)	-0.067** (0.032)	-0.034 (0.030)	-0.065** (0.031)	-0.044 (0.032)	-0.070** (0.029)	-0.093*** (0.033)	-0.101*** (0.031)
Control variables									
Size (log assets)	-0.066*** (0.018)	-0.098*** (0.007)	-0.114*** (0.007)	-0.113*** (0.007)	-0.111*** (0.007)	-0.114*** (0.007)	-0.089*** (0.007)	-0.087*** (0.008)	-0.071*** (0.008)
Market leverage	-0.403*** (0.117)	0.129*** (0.048)	0.255*** (0.048)	0.149*** (0.052)	0.145*** (0.054)	0.160** (0.063)	0.185** (0.075)	0.052 (0.075)	-0.056 (0.079)
R&D/Sales	-2.789*** (0.199)	-0.285*** (0.011)	-0.205*** (0.009)	-0.145*** (0.006)	-0.191*** (0.008)	-0.183*** (0.008)	-0.134*** (0.005)	-0.133*** (0.005)	-0.057*** (0.002)
Advertising/sales	1.860** (0.923)	-1.281*** (0.255)	-1.267*** (0.128)	-0.937*** (0.321)	0.095 (0.464)	0.961* (0.501)	0.240 (0.445)	-0.171 (0.404)	-0.401 (0.355)
Asset Tangibility	-0.125 (0.090)	-0.176*** (0.029)	-0.029 (0.030)	0.022 (0.030)	-0.023 (0.029)	-0.020 (0.030)	0.028 (0.030)	0.039 (0.031)	0.058* (0.030)
Employees	0.006*** (0.001)	0.007*** (0.001)	0.007*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Payout ratio	1698 (1.919)	-0.761 (0.518)	-0.264 (0.269)	0.281 (0.408)	0.200 (0.288)	0.767 (0.628)	0.456 (0.555)	0.656 (0.680)	1248 (0.794)
Age (in years)	0.004 (0.003)	0.009*** (0.001)	0.012*** (0.001)	0.012*** (0.001)	0.009*** (0.001)	0.008*** (0.001)	0.009*** (0.001)	0.008*** (0.001)	0.009*** (0.001)
Regression information									
Constant	1.889*** (0.137)	1.530*** (0.049)	1.437*** (0.051)	1.326*** (0.050)	1.351*** (0.052)	1.385*** (0.051)	1.249*** (0.053)	1.257*** (0.057)	1.099*** (0.057)
Observations	875	5,454	5,358	4,938	4,592	4,325	4,198	4,068	3,94
R-squared	0.191	0.126	0.143	0.147	0.151	0.154	0.133	0.133	0.121

Appendix 17 continues here

ROA										
2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
-0.070**	-0.148***	-0.125***	-0.102***	-0.084**	-0.134***	-0.081**	-0.093***	-0.081**	-0.102***	-0.144***
(0.032)	(0.034)	(0.029)	(0.035)	(0.037)	(0.034)	(0.034)	(0.033)	(0.032)	(0.034)	(0.028)
-0.079***	-0.094***	-0.102***	-0.101***	-0.092***	-0.101***	-0.087***	-0.066***	-0.076***	-0.072***	-0.072***
(0.007)	(0.009)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
-0.110*	0.033	-0.070	-0.202***	-0.238***	-0.342***	-0.312***	-0.277***	-0.187***	-0.191***	-0.044
(0.058)	(0.052)	(0.059)	(0.069)	(0.059)	(0.062)	(0.071)	(0.066)	(0.056)	(0.058)	(0.062)
-0.087***	-0.097***	-0.190***	-0.190***	-0.195***	-0.218***	-0.074***	-0.042***	-0.027***	-0.021***	-0.026***
(0.004)	(0.004)	(0.008)	(0.008)	(0.008)	(0.010)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
0.331	0.431	0.510	0.114	0.039	0.001	-0.357	-0.736**	-0.714***	-0.092	-0.166
(0.388)	(0.479)	(0.438)	(0.431)	(0.384)	(0.361)	(0.329)	(0.292)	(0.272)	(0.307)	(0.237)
0.084***	0.073**	0.027	0.035	0.100***	0.082***	0.091***	0.094***	0.039*	0.042*	0.039*
(0.030)	(0.031)	(0.027)	(0.026)	(0.029)	(0.029)	(0.030)	(0.029)	(0.022)	(0.022)	(0.022)
0.005***	0.006***	0.007***	0.007***	0.006***	0.006***	0.005***	0.005***	0.005***	0.004***	0.004***
(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
1.307***	0.263	0.496	0.722	-0.788*	0.940**	1.417*	0.468	0.015	0.525	0.942*
(0.479)	(0.280)	(0.589)	(0.529)	(0.451)	(0.414)	(0.726)	(0.592)	(0.292)	(0.447)	(0.523)
0.009***	0.008***	0.006***	0.007***	0.007***	0.007***	0.008***	0.008***	0.009***	0.008***	0.008***
(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
1.098***	1.312***	1.288***	1.320***	1.277***	1.355***	1.165***	0.996***	1.050***	0.949***	0.922***
(0.053)	(0.060)	(0.054)	(0.058)	(0.060)	(0.061)	(0.062)	(0.057)	(0.054)	(0.053)	(0.051)
4,338	4,166	3,927	3,801	3,703	3,589	3,580	3,615	3,559	3,330	3,200
0.137	0.122	0.162	0.156	0.154	0.171	0.152	0.139	0.150	0.155	0.161

Appendix 18: Robustness check years for matched sample

This robustness check, checks the different years used in the matched sample, testing with an OLS regression. The robust standard errors are the numbers in parentheses and the significance is shown with *** (p<0.01), ** (p<0.05), * (p<0.1).

	ROA								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Variables of interest									
Dual share status	-0.237* (0.129)	-0.032 (0.051)	0.036 (0.045)	0.048 (0.044)	-0.008 (0.048)	0.014 (0.045)	-0.058 (0.054)	0.006 (0.045)	0.069 (0.050)
Control variables									
Size (log assets)	-0.084* (0.044)	-0.106*** (0.014)	-0.131*** (0.014)	-0.130*** (0.015)	-0.105*** (0.014)	-0.096*** (0.013)	-0.101*** (0.017)	-0.067*** (0.014)	-0.067*** (0.020)
Market leverage	0.067 (0.250)	0.181* (0.098)	0.088 (0.102)	0.134 (0.095)	-0.087 (0.104)	0.172 (0.139)	0.058 (0.135)	-0.155 (0.128)	-0.008 (0.146)
R&D/Sales	-1.243*** (0.288)	-0.187*** (0.016)	-0.158*** (0.021)	-0.180*** (0.019)	-0.174*** (0.019)	-0.129*** (0.013)	-0.134*** (0.013)	-0.060*** (0.008)	-0.089*** (0.010)
Advertising/sales	1596 (1.523)	-1.318*** (0.349)	-2.340*** (0.549)	-1.731* (0.993)	-0.652 (0.927)	-0.797 (0.725)	-1.368* (0.736)	-0.613 (0.599)	-0.675 (0.848)
Asset Tangibility	-0.049 (0.221)	-0.195*** (0.060)	-0.085 (0.066)	-0.047 (0.055)	-0.052 (0.059)	-0.011 (0.055)	0.002 (0.056)	0.064 (0.050)	-0.031 (0.063)
Employees	0.005** (0.003)	0.004*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.002 (0.001)
Payout ratio	1015 (4.641)	-0.068 (0.493)	-0.800 (0.623)	-0.187 (0.462)	2.540* (1.516)	0.231 (0.777)	-2.013** (0.987)	0.449 (1.319)	0.917 (1.505)
Age (in years)	0.012 (0.007)	0.009*** (0.002)	0.012*** (0.002)	0.009*** (0.002)	0.007*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.011*** (0.002)
Regression information									
Constant	1.607*** (0.317)	1.542*** (0.122)	1.582*** (0.114)	1.414*** (0.117)	1.354*** (0.108)	1.166*** (0.106)	1.465*** (0.131)	1.116*** (0.114)	1.096*** (0.138)
Observations	164	897	888	852	896	829	790	840	730
R-squared	0.186	0.148	0.184	0.205	0.162	0.171	0.161	0.111	0.106

ROA									
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0.040 (0.054)	-0.000 (0.045)	0.017 (0.053)	0.061 (0.056)	-0.129** (0.058)	-0.010 (0.053)	-0.095* (0.052)	-0.026 (0.051)	-0.091* (0.055)	-0.088** (0.043)
-0.141*** (0.018)	-0.108*** (0.015)	-0.104*** (0.021)	-0.128*** (0.019)	-0.109*** (0.020)	-0.109*** (0.018)	-0.062*** (0.018)	-0.094*** (0.015)	-0.093*** (0.017)	-0.078*** (0.013)
-0.119 (0.103)	0.024 (0.119)	-0.147 (0.166)	-0.090 (0.139)	-0.353*** (0.126)	-0.425*** (0.133)	-0.281** (0.125)	-0.284** (0.126)	-0.087 (0.123)	-0.237** (0.106)
-0.102*** (0.012)	-0.180*** (0.016)	-0.201*** (0.026)	-0.377*** (0.141)	-0.231*** (0.022)	-0.099*** (0.017)	-0.051*** (0.010)	-0.034*** (0.007)	-0.019*** (0.002)	-0.030*** (0.003)
-1320 (0.847)	-0.020 (0.867)	-1.551** (0.671)	-0.225 (0.764)	-1197 (0.742)	-0.195 (0.566)	-0.860 (0.536)	-0.199 (0.505)	0.031 (0.655)	0.511 (0.442)
-0.013 (0.056)	0.022 (0.052)	-0.077 (0.059)	0.004 (0.063)	-0.004 (0.060)	0.124* (0.065)	-0.006 (0.058)	0.205*** (0.055)	0.031 (0.061)	0.008 (0.046)
0.005*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
0.317 (0.389)	-0.104 (0.872)	-0.240 (0.979)	-0.760 (0.859)	0.525 (0.891)	1108 (1.158)	2.758* (1.481)	0.296 (0.579)	1143 (1.354)	0.048 (0.676)
0.011*** (0.002)	0.009*** (0.002)	0.012*** (0.002)	0.012*** (0.002)	0.007*** (0.002)	0.009*** (0.002)	0.005** (0.002)	0.008*** (0.002)	0.011*** (0.002)	0.009*** (0.002)
1.746*** (0.140)	1.414*** (0.122)	1.391*** (0.152)	1.643*** (0.139)	1.656*** (0.153)	1.481*** (0.135)	1.306*** (0.133)	1.190*** (0.129)	1.177*** (0.140)	1.103*** (0.110)
717 0.186	648 0.195	644 0.157	670 0.181	661 0.177	610 0.164	655 0.082	690 0.155	609 0.149	638 0.208