

FTSE Russell hurdle rate criterium as a sanctioning mechanism for low public voting right firms

Event study analysis

Master Thesis

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Abstract

In the absence of a robust response from stock exchanges and financial regulators, index providers try to take action to discourage companies to list with unequal voting right share structures. One of these index providers is FTSE Russell, who imposed a new index eligibility criterium in 2017 that forces firms to have more than 5% voting rights in the hands of unrestricted (free-float) shareholders in order to be eligible for index inclusion. Current index constituents, however, are grandfathered for 5 years, after which they need to meet the rule to remain eligible. By applying the event study methodology, this paper examines the share price effect of US firms that are added to an indicative list of excluded and potentially excluded firms due to this new eligibility criterium. I find that on average investors perceive addition to this list, and hence a (potential) exclusion, as negative news, resulting in statistically significant negative average abnormal returns. Therefore, investors seem to penalize firms based on their prospective exclusion. Considering firm-specific characteristics, the results suggest that small stocks, low profitable and loss-making stocks, 'growth' stocks and young publicly listed stocks are more adversely affected by a potential exclusion than big stocks, high profitable stocks, 'value' stocks and old publicly listed stocks.

Keywords: Unequal voting right shares, Index addition/deletion price effects, Event study, FTSE Russell's hurdle rate, Corporate Governance



Table of contents

1. Introduction.....	1
2. Literature review	4
2.1 Dual-class voting structures.....	4
2.2 Importance of index addition and deletion on shareholders' value.....	6
2.3 Prior research relating index membership to dual-class share structures	10
2.4 Hypothesis development.....	11
3. Institutional details and dataset	14
3.1 FTSE Russell's hurdle rate decision.....	14
3.2 Eligibility criteria affected FTSE Russell indices	14
3.3 Data and descriptive statistics.....	15
4. Empirical model.....	18
4.1 Event study methodology	18
4.2 Cross-sectional multivariate regression analysis of abnormal returns	22
5. Empirical results	24
5.1 Initial hurdle rate announcement – Event date category 1	24
5.2 Addition after initial announcement – Event date category 2	31
6. Conclusion	39
References	41
Exhibit 1 Variable description	43
Exhibit 2 Additional sample properties	44
Exhibit 3 Breusch-Pagan/Cook-Weisberg test for heteroscedasticity	45
Exhibit 4 Robustness check subsamples	47

1. Introduction

The use of an unequal voting right share structure has been a controversial topic in corporate governance literature for the past few years. The majority of the firms accomplish this structure by issuing so-called dual-class shares, in which one share class assigns low (usually 1 voting right) or zero voting rights to public investors and the other share class assigns superior voting rights (usually 10 voting rights) to founders and/or other insiders. In March 2017 this topic gathered more attention when technology giant Snap Inc. went public by issuing stocks with no voting rights. This intensified the debate on unequal voting right share structures. Pressure from institutional investors and other related index-tracking parties made two leading index providers decide to exclude (S&P) or limit (FTSE Russell) companies with unequal voting rights.

One of these index providers who quite recently imposed a sanction for unequal voting right share firms is FTSE Russell. In June 2017 FTSE Russell consulted index users and other stakeholders whether the index provider should impose a minimum hurdle rate regarding the percentage of a company's voting rights in the hands of non-restricted (free-float) shareholders. A majority of index users and other stakeholders (68%) agreed that a minimum hurdle rate should be introduced (FTSE Russell, 2017). As a result, FTSE Russell decided to impose a 5% hurdle rate, starting September 2017, on companies which have assigned a developed market nationality by FTSE Russell (FTSE Russell, 2018). This entails that firms are required to have greater than 5% of the company's voting rights in the hands of unrestricted (free-float) shareholders in order to remain or to get included in a particular FTSE Russell index. However, those companies that are already included in one of the affected indices before September 2017 and do not meet the hurdle rate are grandfathered for a period of 5 years (until September 2022).

Although a lot of research has been conducted since the late 1980s on the price effects of index constituent changes, very little research has been conducted on incorporating voting power into index methodology. More specifically, there is little known about whether index providers are an appropriate corporate governance arbiter to influence companies' decisions on issuing unequal voting right shares. To my knowledge, recent research by Winden and Baker (2018) are the first to address this question by looking at Standard & Poor's (S&P) 1500 dual-class companies restriction rule, which excludes all dual-class share firms that are not yet in one of the S&P Dow Jones indices. They conclude that this S&P restriction rule is ineffective as they fail to find any statistically significant negative abnormal returns for firms that are excluded due to this new rule. Therefore, they think that exclusion may not be expected to materially adversely affect the cost of capital of excluded firms. With regard to FTSE Russell hurdle rate criterium, this thesis addresses this topic by asking the following research question:

How does FTSE Russell's public voting right hurdle rate decision affect shareholder value of (potentially) excluded US firms?

In order to answer the research question, this paper begins with applying the short-term event study methodology on FTSE Russell's announcements that certain firms will or could potentially be excluded from one of the subjected indices. FTSE Russell has published a so-called 'indicative list of affected securities' at its initial announcement of the introduction of the hurdle rate on July 26th, 2017. Since then, it has updated this list several times adding new excluded and potentially excluded firms to the list due to the hurdle rate based on the most recent index review. This indicative list enables this research to distinguish between a treatment and control group for the event study. The treatment group represents firms that got added to the indicative list, hence which faces immediate or prospective exclusion, whereas the control group represents index constituents that are not added to this indicative list, and therefore do not face exclusion based on their public voting right percentage. Besides that, this paper conducts two separate event studies: one event study for the initial announcement (first publication of the indicative list) and one event study for the subsequent additions to this indicative list after its initial publication. Although the hurdle rate also applies to firms of other developed countries, this paper solely examines US firms because it makes the research setting more reliable as firms are homogeneous in terms of country characteristics.

Regarding the initial announcement, both the treatment and control group seem to experience approximately equal modest negative abnormal returns. However, both groups mainly lack statistical significance. An important limitation for this event is that the results of the treatment group might be influenced by the wrong allocation to this group as it is not clear whether all firms, that are included in this treatment sample, were already included in the initial indicative list or in the subsequent update of the list. Therefore, it is hard to make reliable inference regarding this initial announcement.

The second event study category, however, is not exposed to this potential treatment sample misallocation and therefore is more reliable. Based on this event study, the treatment firms on average exhibit negative statistically significant abnormal returns, indicating that the market on average penalized firms that will or will potentially be excluded due to the hurdle rate criterium. Despite that, the majority of these treatment firms is grandfathered for 5 years and has more than 5% public voting rights. However, FTSE Russell annually reviews the magnitude of the hurdle rate between 5 and 25%. Hence, it seems that the potential threat of exclusion due to an increase in the magnitude of the hurdle rate is also adversely priced by investors.

Firms that fail to meet the 5% hurdle rate and are not grandfathered seem to experience the highest negative abnormal returns. It needs to be noted that this result is not completely convincing as it is not statistically significant on every considered test statistic. However, this result makes economic sense as these firms are the most affected in the short-term because they will be immediately ineligible for index inclusion.

Next to the event study, additional cross-sectional regression analysis of cumulative abnormal returns is executed. Based on these regressions, the results suggest that small stocks, low profitable and loss-making stocks, ‘growth’ stocks (high market to book ratio) and young publicly listed stocks experienced a more adversely cost of capital effect than big stocks, high profitable stocks, ‘value’ stocks (low market to book ratio) and stocks that are already listed for a long period of time. This might indicate that the threat of an index exclusion is more important for relatively small, young, immature firms with high growth potential.

This thesis contributes to the academic literature relating to the corporate governance role of index providers by being the first to examine a different index provider (FTSE Russell) than S&P who imposed an index eligibility restriction on low public voting right firms. By documenting that the market perceives a (potential) index exclusion¹ as negative news, this paper sheds more light on whether index providers might be able to influence founders and/or insiders’ decision regarding issuing unequal voting right shares.

The remainder of this paper is outlined as follows: Section 2 provides an overview of the most relevant academic literature related to this research and the hypothesis development. Section 3 proceeds with describing the institutional details and dataset. Afterward, section 4 provides the empirical strategy which this thesis applies. Finally, section 5 discusses the main results of this thesis after which section 6 concludes.

¹ For simplicity reasons, when I mention ‘a (potential) index exclusion’, I refer to both firms that are immediately excluded and firms that are temporarily grandfathered and thus face a threat of exclusion.

2. Literature review

This literature review attempts to discuss the most relevant academic research in order to form possible hypotheses for the research question. This chapter starts by examining the main benefits and costs of unequal voting right share structures in order to understand the controversy about this topic. Solely research relating to dual-class share structures will be considered as this is the main used unequal voting right structure and therefore the most considered in academic research. The chapter proceeds explaining the financial importance of index membership by looking at prior research regarding abnormal price effects on index addition/deletion. This enables to question whether an index public voting right eligibility criterium might be an appropriate tool to influence companies' decisions on issuing unequal voting right shares. Afterward, the hypotheses that attempt to explain the addition/deletion abnormal price effects, will be explained briefly. Subsequently, recent research which combines dual-class share structures and index membership will be described, what directly relates to this research paper. Finally, the hypothesis development for this thesis' research question will be described.

2.1 Dual-class voting structures

Public investors and company founding shareholders (and/or other controlling shareholders) usually differ in view on dual-class share structures. Companies' founding shareholders (that agree with dual-class shares) mainly argue that dual-class shares allow them to focus on long-term performance, protecting themselves against market pressure to deliver short-term returns. On the other hand, public equity investors (that disagree with dual-class shares) mainly argue that dual-class shares disable them to participate in important corporate governance decisions and limit their ability to express their views (Melas, 2018). This section's aim is to provide a brief overview of the main benefits and costs associated with dual-class share structures in order to understand the controversy around this topic.

Benefits of dual-class voting structures

The most important argument in favor of a dual-class share structure is that it gives the founders control over the company, even though the founding shareholders' equity stake might not be the majority. The proponents of this structure argue that this control mechanism allows the founders to freely execute their vision without worrying about (short-term) stock market performance and thus enhance the companies' long-term financial performance (CFA Institute, 2018). Consequently, the presence of a dual-class share structure decreases substantially the threat of a potential hostile takeover. From a public investor's perspective, however, a lower hostile takeover threat could also be harmful as it could induce managerial entrenchment. This will be explained in more detail in the costs section.

Research conducted by Gompers, Ishi & Metrick (2009) contradict the above-stated hypothesis of firm value enhancement due to substantial founder control. Using a panel data sample of all single-class and

dual-class firms in the US between 1995 and 2002, Gompers et al. find that on average being a dual-class firm is associated with lower firm value. Looking more specifically, when only considering US dual-class firms, they find that higher insider voting rights², holding cash flow rights fixed, is associated with a lower firm value (as measured by Tobin's Q³). This effect is also well known in the academic literature as an 'entrenchment effect' (S. Claessens, 2002). Gompers et al. additionally find that firm value of dual-class firms is positively related to insider's cash flow rights, which effect is commonly referred to as an 'incentive effect' (S. Claessens, 2002).

Although the above findings contradict the hypothesis of financial performance improvement by a higher founder control, they do not consider the firms' listing stage (time since the IPO). An interesting recent working paper by Cremers, Lauterbach, and Pajuste (2018) considers this listing stage. Using a matched sample of US dual and single-class companies for the period between 1980 and 2017, they find that there is substantial variation in the relative valuation of dual-class firms to matched single class firms over their life cycle after the IPO. At the end of the IPO year, the firm value (as measured by Tobin's Q³) of the dual-class firms is, on average, 13% higher than that of the matched single-class firms. However, this initial dual-class valuation premium diminishes in the years after the IPO. Eventually, the dual-class firms start trading at a relatively lower valuation than their matched single-class firm about six to nine years after the IPO. Hence, in the first few years after the IPO, a dual-class share structure seems to be beneficial in terms of shareholder value whereas at a later point this advantage seems to vanish as the company enters a more mature stage.

Another argument supporting the presence of dual-class shares is that some entrepreneurs would simply not go public when they are not able to retain control. For instance, the allowance of such a structure by a stock exchange could be an important reason for a family-owned company to go public. According to Clearly and Alderighi (2018), based on a survey of 53 unlisted family firms across the world, the main reason for not considering a public listing is the fear of losing control. Their reluctance to go public diminishes when it is allowed to issue dual-class shares. Hence, the absence of dual-class share structures could reduce the investment opportunity set for all public investors. And from a firm's perspective, dual-class share structures increases access to public financing without losing control.

Costs of dual-class voting structures

The vast majority of the academic literature related to the downsides of dual-class share structures focusses on the agency problems that could consequently arise from these structures. First introduced by Jensen and Meckling (1976), these agency problems arise because of conflicts of interest between

² Gompers et al. refer to insiders as officers and directors.

³ They measure Tobin's Q as following: $Q_{it} = [BV_{it} \text{ Assets} + MV_{it} \text{ of Common Stock} - BV_{it} \text{ of Common Stock} - \text{Deferred Taxes}_{it}] / BV_{it} \text{ Assets}$

shareholders and owner-managers. The associated costs of dual-class share structures are most often referred to as ‘private benefits of control’ or ‘managerial entrenchment’ such as perquisite consumption, empire-building, and excessive compensation. Opponents of this structure argue that whenever the difference between insiders’ voting rights and cash flow rights (also known as the ‘wedge’) increases, the agency problems become more present.

As mentioned before, Gompers et al. (2009) showed that the firm value of dual-class firms is decreasing with higher insider voting rights. However, they do not explain the channels through which the divergence of insider control rights and cash flow rights leads to lower shareholder value. Masulis, Wang and Xie (2009) use a sample of US dual-class companies between 1994 and 2002 to show that when the difference between insiders’ voting and cash flow rights widens, corporate cash holdings are worth less to outside shareholders, CEOs receive higher compensation, managers make more often value-destroying acquisitions and big capital expenditures contribute less to shareholder value. In different words, these findings support the agency hypotheses that managers with excess control rights over cash flow rights tend to pursue private benefits at (non-controlling outside) shareholders’ expense.

2.2 Importance of index addition and deletion on shareholders’ value

Over the past couple of decades, several research studies have already been conducted concerning share price behavior around index additions and deletions. Although this thesis will not examine the announcement of an addition/deletion, it is still relevant to understand the findings of these studies because this research is related to it as FTSE Russell’s hurdle rate could potentially lead to an index exclusion. This section attempts to discuss important academic findings concerning abnormal price effects of index additions/deletions.

Share price effects of index addition and deletion

A notable characteristic of prior research regarding addition/deletion price effects of indices is that most of them are conducted on composition changes in the S&P500. This is due to the fact that the S&P500 is still one of the leading and largest indices globally. However, as this thesis’ focus is on FTSE Russell indices, this section also attempts to consider research concerning FTSE Russell’s index changes.

While there seems to be some consensus on the direction and magnitude of the index effect: added (deleted) firms to indices experience positive (negative) abnormal returns (e.g. symmetric price response), there are still some divergent conclusions. Besides that, there is little consensus on whether the price effects are permanent or temporary and little consensus about proposed hypotheses that try to explain these price effects. Below there will be elaborated on the index addition and deletion price effects in chronological order to show how this literature strand has evolved over time.

Research examining abnormal price effects on index constituent changes goes way back to 1986 when Schleifer (1986) initiated this strand of literature by examining stock additions to the S&P500 index to investigate the downward sloping demand curve hypothesis, which will be explained later on. With a sample size of 246 additions in the period 1966-1983, he explored statistically significant results of a positive cumulative average abnormal addition return of approximately 3% since 1976 (up to and including 1983), which mostly persisted for 10 to 20 trading days. The reason for Schleifer not considering deletions is an insufficient sample size of deletions at that time.

One of the first academics who managed to examine index deletion effects, besides index addition effects, were Lynch and Mendenhall (1997). Considering a sample period between 1990 and 1995 with 55 additions and 53 deletions to the S&P500 and using the standard event study methodology, they find a symmetric price response that firms who get added (deleted) to the index experience positive (negative) statistical significant abnormal returns. For the additions, they find a statistically significant positive mean CAR of 4.9%, from the announcement date up to 10 days after the effective date. Furthermore, for the deletions, they find a high negative significant CAR of 14.1% for the same period. However, they conclude that these price effects are temporary and reverse in the period following 10 days after the effective date.

In contrast to a symmetric price response, Chen, Noronha, and Singal (2004) find an asymmetric price response to index changes in the S&P500 index of 760 additions and 235 deletions between 1962 and 2000. Using the event study methodology, they discover a permanent statistically significant positive mean Cumulative Abnormal Return (CAR⁴) of firms added to the S&P500 for the period between 1976 and 2000, whereas they fail to find a statistically significant permanent negative mean CAR⁵ for deleted firms in the entire considered sample period (1962-2000). Furthermore, with regard to the S&P500 additions, the addition price effect has been increased over time when comparing the sample period 1976-1989 (mean CAR⁴ of 3.6%) with 1989-2000 (mean CAR⁴ of 6.2%).

Findings from a more new research paper by Petajisto (2011) are consistent with the increasing index addition premium (up to 2000) found by Chen et al. Petajisto considers additions and deletions from the S&P500 and Russell 2000 over a sample period from 1990 to 2005. In contrast with Chen et al.'s findings, however, he discovers that the (short-term) addition effect (for both considered indices) has peaked in the 2000s and declined substantially in the period towards 2005. Furthermore, based on

⁴ This mean CAR entails the period from the index composition announcement date to 60 days after the effective date of the index composition.

⁵ Although they do not find a permanent negative mean CAR, they do find a highly statistical significant mean AR on the announcement date in the period 1989-2000. Nevertheless, they show that this price effect is not permanent as it reverses in the period following the announcement date.

Petajisto's research it is difficult to say whether there are permanent addition and deletion effects due to the absence of statistically significant results from these long-term mean CARs (for both indices).

More novel research conducted by Chang, Hong, and Liskovich (2014) is focusing on the price effect of additions/deletions between the FTSE Russell 1000 and Russell 2000 indexes. Using a Fuzzy Regression Discontinuity Design (RDD) ⁶, they find that stocks that moved from the Russell 1000 index to the Russell 2000 index have permanent discontinuously statistically significant higher returns (5%) in June (after the announcement date of the index composition at the last trading day of May) compared with stocks that slightly missed making it into the Russell 2000 (addition effect). Besides that, they also find a statistically significant permanent deletion effect that stocks who moved from the Russell 2000 to the Russell 1000 index have lower returns (5.4%) in June than stocks that just stayed in the Russell 2000 index. These results are consistent with a symmetric price response to index addition/deletion. Key to their empirical approach (Fuzzy RDD) is that it addresses the potential endogeneity issue of index addition/deletion. By focusing on the 1000 rank cutoff (which determines addition to R1000 or R2000), they ensure that they are only measuring the effects of index membership on the price as they verify that firm characteristics are continuous around this 1000 rank cutoff.

Possible explanations of abnormal price effects

As previously described, there is substantial research indicating divergent conclusions on index addition/deletion price effects. The academic literature has advanced several hypotheses that attempt to explain these permanent/temporary abnormal price effects. These hypotheses can be classified into two broad categories: demand-based and information-based hypotheses, which will be briefly explained below.

Demand-based hypotheses

Proponents of the demand-based hypotheses argue that investors who are tracking a certain index trigger a temporary or permanent upward pressure on the stock price that results in positive abnormal returns around the time of inclusion (Schleifer, 1986).

Price pressure hypothesis

First proposed by Scholes (1972), the 'price pressure hypothesis' explains the abnormal price adjustment as a temporary effect, which will reverse in the period after the definite index change. It says that abnormal stock returns are caused by excessive trading behavior from index-related instruments. In different words, the price pressure hypothesis suggests that stocks' demand curve is downward sloping in the short term and that stock prices will revert to their original levels whenever the excessive trading behavior ends, suggesting a horizontal demand curve for stocks in the long-run.

⁶ Their sample consists of additions and deletions across Russell 1000 and 2000 between 1996 and 2012.

Imperfect substitution hypothesis

In contrast to the price pressure hypothesis, the ‘imperfect substitution hypothesis’ implies a permanent adjustment in the stock prices, suggesting a long-term downward sloping demand curve (Schleifer, 1986). This hypothesis is based on the assumption that different stocks are not equal (or perfect substitutes) when they are not in the same index, which thus results in permanent price differences.

Information-based hypotheses

Proponents of information based hypotheses argue that the announcement of a stock’s addition (deletion) to an index conveys new positive (negative) public news about the underlying fundamentals of the stock, which was not publicly available before the announcement of the index composition (H. Chen et al, 2004).

Information (signal) hypothesis

This hypothesis tends to be more relevant for indices, like the S&P500, that are believed to use more membership criteria than solely market capitalization. It argues that index changes convey new public information about the stock’s future prospects (e.g. cash flow and risk), which results in abnormal price adjustments. Hence, index inclusions tend to work as certification for the quality of the company. Research conducted by Denis, McConnell, Ovtchinnikov, and Yu (2003) gives a good example supporting this hypothesis. They explore that analyst revise their earnings forecast (EPS) when a company gets included in the S&P500, indicating that index inclusion is not an information-free event.

Liquidity hypothesis

Closely related to the information hypothesis, the liquidity hypothesis emphasizes that the abnormal price increase of index inclusion is due to an increase in a stock’s liquidity. The increase in liquidity is caused through an increased interest from financial stock analysts and investors, which leads to an increase in public information about the company (i.e. declining asymmetric information). As a result, the stock will be traded more widely, become more liquid, and the bid-ask spread on the stock will fall. Hence, this will result in a lower required rate of return and thus a leads to an immediate price increase after inclusion (Schleifer, 1986).

Investor awareness hypothesis

The investor awareness hypothesis explains the index addition positive abnormal returns by stating that a stock’s addition to an index raises the awareness about its existence. This hypothesis is consistent with the findings by Chen et al. (2004), explained earlier. Even though they discovered a permanent positive statistical significant addition effect, they failed to find a statistical significant permanent negative deletion effect. They explain this asymmetric price response as ‘*While more investors become aware*

of stocks added to the index, the number of investors aware of deleted stocks may not actually fall because it may be difficult for investors to become 'unaware' of those stocks.'.

Selection criteria hypothesis

This hypothesis argues that the index revision abnormal price effects are to some extent driven by the selection criteria that are used for rebalancing the index. Any upward pressure on the share prices for newly added companies could be related to for instance improvements in liquidity, market capitalization, profitability or any other index membership criterium in the period before the revision. This hypothesis essentially comprises a selection bias of stocks. For example, Benchmann (2004) concludes that this hypothesis partly explains the abnormal returns to changes in the Danish KFX index.

2.3 Prior research relating index membership to dual-class share structures

Although a lot of research has been conducted since the late 1980s on price effects of index constituent changes (additions/deletions), very little research has been conducted on the use of indexation as a sanctioning mechanism on firms with unequal voting right structures. In different words, there is little known about whether index providers could be an effective 'source of regulation' to influence companies' decisions on issuing unequal voting right shares.

A recent working paper by Winden and Baker (2018) is one of the first papers that addresses the efficacy of an index provider as a corporate governance arbiter that imposed a sanction on dual-class share companies. Using a short-term event study methodology, they consider S&P's new eligibility criterium that dual-class companies would henceforth be excluded from the S&P 1500 composite index and its components (S&500, S&P400 and S&P600). Because S&P grandfathered the companies already included in the indices, Winden and Baker are able to compare stock price movements of dual-class firms currently in the index (grandfathered and hence not subject to the rule) (control sample) with stock price movements of dual-class firms not yet included in the index at the time of the announcement (treatment sample). Unfortunately, they do not mention in their working paper how they selected companies for the treatment sample. This is critical and not obvious as S&P1500 index membership is also based on subjective criteria, like financial viability, rather than solely objective criteria like market capitalization and free-float.

For their event study, they consider two discrete event dates. The first date entails the S&P announcement at which they were conducting a consultation with members of the investment community on the eligibility of unequal share classes in the S&P DJ indexes (April 3rd, 2017). The second date entails the announcement of S&P's decision to restrict indexation for firms with dual-class share structures (July 31st, 2017). For the normal return calculation, they make use of the market model with the CRSP equally weighted return index as the market portfolio. Besides that, they add a two-factor

benchmark return, which is next to the market portfolio, based on the Fama-French 17 industry classification. Hence they control for both systematic risk and industry-fixed effects in the normal return calculation.

Winden and Baker hypothesize that S&P's index exclusion sanction will not be sufficiently costly for the affected firms to discourage dual-class listings. They argue this based on several reasons: they think it is difficult or even impossible to implement a sanction through the public capital market (through index providers); a vanishing index inclusion effect; a relatively modest total index investing percentage of the market capitalization of US equities ⁷; and a high proliferation of alternative index investing opportunities.

In line with their expectations, they do not find any statistically significant abnormal returns ⁸ on both event dates for both the treatment and control sample. For their first event on April 4th, 2017 (the day after announcement conducting consultation) they find an insignificant negative AAR for both the treated (-0.192%) and control sample (-0.066%). Additionally, regardless of statistical significance, they find a positive AAR (0.437%) on August 1st, 2017 (the day after announcement index restriction) for the treated sample whereas they find a negative AAR (-0.121%) on this date for the control sample. Hence, Winden and Baker suggest that exclusion is not expected to have a significant adverse cost of capital effect on firms that elect to list with a dual-class stock structure in the future and they conclude that the sanction is ineffective.

2.4 Hypothesis development

As this research paper addresses a quite novel literature strand, besides Winden and Baker, the existing literature does not yet examine what effect an index restriction criterium (in particular FTSE Russell's hurdle rate) on unequal voting right firms could have on (potentially) affected companies' shareholder value. This subsection's aim is to form hypotheses on the research question combining the related literature strands of dual-class share structures and index addition/deletion price effects.

In general, there are two key questions to be asked in order to form an expectation on the sign and magnitude of the price effect on FTSE Russell's hurdle rate decision. First, does the market on average approve or disapprove unequal voting right share structures? Second, does the market on average perceive index inclusion as important or not?

⁷ According to BlackRock, index funds only own 14% of the total market capitalization of the S&P500 (BlackRock, 2017)

⁸ Winden and Baker solely base their conclusions regarding statistical significance on the standard t-statistic.

Based on the literature review it seems that on average for US dual-class companies, firm value is decreasing (Gompers et al., 2009) and private benefits of control (Masulis et al., 2009) are more present with higher insider voting rights, holding cash flow rights fixed. However, when considering a firm's listing age, it seems that a dual-class share structure could be beneficial in the first six to nine years following the IPO in terms of a higher firm value relative to matched single class firms (Cremers et al., 2018). As mentioned before, based on FTSE Russell's consultation with index users and other stakeholders (e.g. institutional investors), 68% agreed that a minimum hurdle rate should be imposed. Hence, the majority perceives an unequal share class structure as not appropriate to some extent and acknowledges the potential agency problems that could arise with these structures.

It is clear that many index tracking investors to some extent disapprove unequal share class structures. However, the main question is whether the overall investment community perceives a (potential) index exclusion by FTSE Russell as important enough to penalize unequal voting right firms by selling their stocks. Below several hypotheses are provided that could hold under different conditions based on the literature review.

One hypothesis could be the following:

Hypothesis 1: There will be a statistically significant negative abnormal price effect on the hurdle rate decision for (potentially) excluded companies that are added to the indicative list of affected securities.

In case this hypothesis holds, this would be in line with FTSE Russell's expectation when they decided on applying the hurdle rate criterium. Because their expectation is based on the premise that in terms of firm value being included in an index is beneficial for a firm and being excluded is harmful for a firm. Therefore, discouraging companies to list with shares that have assigned low or zero voting rights. This hypothesis is in line with findings by Schleifer et al. (1986), Lynch et al. (1997) and Chen et al. (2004). They show that there is a substantial addition and deletion price effect (for the S&P500) in the period 1976 to 2000 and that the addition effect has increased over time (up to 2000). Hence, they show that being included in an index is beneficial in terms of firm value creation and that being excluded leads to destroying firm value. When the market reacts to this potential exclusion with an abnormal negative stock price return, they acknowledge the benefits of being included in an index. besides, in this scenario I expect the firms that will immediately be ineligible for index membership to react more negatively than those firms that are grandfathered for 5 years.

Another hypothesis could be as follows:

Hypothesis 2: There will be no statistically significant abnormal price effect on the hurdle rate decision for (potentially) excluded companies that are added to the indicative list of affected securities.

Whenever this hypothesis holds, it could suggest that the hurdle rate decision is not effective in the sense that it might not incentivize firms to list with equal voting right shares. However, it needs to be emphasized that the majority of the sample firms used in this research are grandfathered for 5 years. Therefore, for the most firms there is a potential threat of index exclusion but no definite exclusion yet. On the one hand, this could mean that the market does not yet fear an exclusion as they are grandfathered for 5 years. On the other hand, a lack of a price reaction could also mean that investors do not materially care about a potential index exclusion. In this case it can be related to findings by Petajisto (2011) who finds that for the S&P500 and Russell 2000 index the addition effect has peaked in the 2000s and declined substantially in the period towards 2005. Hence, according to Petajisto, it seems that being included in an index is not as important anymore as it used to be or was assumed to be. Additionally, this hypothesis is in line with the findings by Winden and Baker's research (2018) on the S&P1500 sanction to exclude dual-class firms. They conclude that the imposed sanction to exclude dual-class firms is ineffective for the S&P indices as they fail to find any statistically significant negative abnormal returns for dual-class firms not yet included in the index and therefore excluded. Hence, these companies are on average not penalized by the market for the fact that they will not get added to the S&P1500 indices due to a dual-class share structure. Therefore, this sanction might not give companies sufficient incentives to list with an equal voting right share structure. Furthermore, S&P's sanction of excluding all dual-class firms seems to be more severe than FTSE Russell's hurdle rate, as FTSE Russell still permits dual-class firms to some extent. Hence, while S&P's sanction seems to be ineffective, this might give reason to think that FTSE Russell's hurdle rate decision has no effective impact.

A final hypothesis could be:

Hypothesis 3: There will be a statistically significant positive abnormal price effect on the hurdle rate decision for (potentially) excluded companies that are added to the indicative list of affected securities.

This reaction could suggest that the market on average perceives a (potential) index exclusion as positive news. For instance, the market could think that this hurdle rate criterium could incentivize (potentially) excluded companies to increase their public voting right percentages, and thus increasing public equity investors' participation in important corporate governance decisions.

3. Institutional details and dataset

This section provides an overview of the most relevant institutional details, the dataset and descriptive statistics regarding this research paper.

3.1 FTSE Russell's hurdle rate decision

In June 2017 FTSE Russell consulted index users and other stakeholders whether the index provider should impose a minimum hurdle rate regarding the percentage of a company's voting rights in the hands of non-restricted (free-float) shareholders. A majority of the index users and other stakeholders (68%) agreed that a minimum hurdle rate should be imposed (FTSE Russell 2017). As a result of the consultation, FTSE Russell decided to impose a 5% hurdle rate, starting September 2017, on companies which have assigned a developed market nationality ⁹ (FTSE Russell, 2018). This means that these companies are required to have greater than 5% of the company's voting rights in the hands of unrestricted (free-float) shareholders in order to remain or get included in a particular FTSE Russell index. Those companies that are already included in one of the affected indices before September 2017 and do not meet the hurdle rate are grandfathered for a period of 5 years (until September 2022). FTSE Russell's computation of a company's voting right percentage in public hands is calculated by dividing the number of votes in the hands of unrestricted (free-float) shareholders by the total number of votes conferred by the shares outstanding of all the company's voting securities. For instance, company A has the voting rights structure as defined in table 1. This structure results in approximately 2% (65 million/3.1 billion) of the company's voting rights in public hands.

Table 1 Example company's percentage of voting rights in public hands

Share class	# Shares	# Votes per share	Total votes	% Free float	% In public hands
A	100,000,000	1	100,000,000	65%	65,000,000
B	300,000,000	10	3,000,000,000	0%	0
Total	400,000,000		3,100,000,000		65,000,000

3.2 Eligibility criteria affected FTSE Russell indices

FTSE Russell declared that the hurdle rate criterium will be imposed to all standard FTSE Russell indexes which include the Russell US Index series (R1000, R2000 & Russell Microcap) and FTSE Global Equity Index Series (GEIS Large, Mid, Small & Micro) (FTSE Russell, 2017). The (potentially) affected companies by this hurdle rate are added to a so-called 'indicative list of affective securities' on different dates by FTSE Russell based on the most recent index review. Below, the most important eligibility criteria, next to the hurdle rate, for the US Index Series and Global Equity Index Series (GEIS) will be briefly described.

⁹ FTSE Russell annually reviews their country classifications in which they categorize countries' stock markets in 'Developed', 'Advanced Emerging', 'Secondary Emerging' or 'Frontier'.

FTSE Russell US Index Series

FTSE Russell US index series consists of several different indices that are all subsets of the Russell 3000E (R3000E) index, which captures approximately 99% of the US equity market. The R3000E represents the 4000 biggest US companies weighted by market capitalization. Derivatives of the index series are the R1000, R2000 and Russell Microcap, which respectively represents rank number 1-1000, 1001-3000 and 2001-4000 of the R3000E index. Most important eligibility criteria, next to the hurdle rate, for the Russell US index series are: The company must trade on an eligible US exchange; Company's stock must have a close price at or above \$1.00; The company needs a minimum market capitalization of \$30 million; The company needs to have at least 5% of the shares freely available in the market place (free-float) (FTSE Russell, 2019).

FTSE Global Equity Index Series (GEIS)

Like the Russell US index series, the Global Equity Index Series (GEIS) also consists of several different indices divided into Micro-, Small-, Mid- and Large-cap based on market capitalization. The FTSE GEIS covers stocks from 48 different countries worldwide. Its most important eligibility criteria, next to the hurdle rate, are: The company needs to have at least 5% of the shares freely available in the market place (free-float); the company needs to pass a certain liquidity turnover threshold as specified by FTSE Russell (FTSE Russell, 2019).

3.3 Data and descriptive statistics

This subsection provides a description of the used dataset and descriptive statistics in order to get insight into the research environment of this thesis.

Data sources and screening

FTSE Russell's indicative list of affected securities is updated several times since its first publication on July 26th, 2017. Hence, the period this research covers lasts from the first publication until the last update of the indicative list on February 18th, 2019. This indicative list contains for each company its voting power percentage in public ownership. For the companies' adjusted close stock prices and all the control variables, Datastream is used.

Unfortunately, the initial publication of the indicative list is not available anymore. After the first publication, the list is updated for the first time on October 20th, 2017. For the Russell US index series, this update indicates that the included data is valid as of September 2017. Hence, it is impossible to distinguish between companies that are added at the initial announcement or at the subsequent update of October 20th, 2017. Therefore, for the event study assumed is that every firm that is included in the October 20th updated list is added at the initial announcement. Hence, this could lead to some biased

event study results for the first publication (initial announcement) as a sample firm might not yet be added to the indicative list at the first publication.

Data screening

This research paper only focuses on US firms because it makes the research more reliable as these firms are homogenous in terms of country characteristics. Therefore, all non-US firms included in the indicative list for the GEIS index series are removed from the sample. Besides that, in line with Winden and Baker's S&P1500 research (2018), this research distinguishes between a treatment and control group. The treatment group covers all the firms that are included in the indicative list of affected securities. As control group, constituent firms from the Russell 3000 series are used that are not included in the indicative list of affected securities ¹⁰. Hence, these control constituents are not affected by the hurdle rate.

In order to obtain an appropriate dataset, the data is first screened on non-US firms. Afterward, the dataset is screened on firms that have either no stock price data available, or have been delisted, (de)merged, acquired or gone bankrupt within the total sample period (estimation & event window). Additionally, companies that fail to meet at least 240 trading days of available stock price data prior to the event date are removed from the dataset ¹¹. This is applied in order to ensure reliable normal benchmark returns for the abnormal return calculations. Finally, the dataset is screened on event observations that lack observations on control variables (see exhibit 1). This results in a final sample size of 5,392 event observations divided into 283 treatment and 5,109 control event observations. For the treatment group, an event observation in this setting is the date at which a company is added to the indicative list of affected securities. An overview of the data screening process is provided in table 2.

Table 2 Data screening process

Data Screening	Deleted observations			N event observations		
	<i>Treatment</i>	<i>Control</i>	<i>Total</i>	<i>Treatment</i>	<i>Control</i>	<i>Total</i>
Initial dataset (incl. non-US firms)	-	-	-	856	5679	6535
After deleting non-US Firms	327	-	327	529	5679	6208
After screening for no stock price data available, no 240 trading days stock price data prior to event date, delistings, (de)mergers, acquisitions and bankruptcies.	216	359	575	313	5320	5633
After deleting firms that lack observations of control variables.	30	211	241	283	5109	5392

Note: This table shows the data screening process that results in the final sample.

¹⁰ The threshold that determines assignment to the indicative list (and thus treatment group) is 25% or less voting rights in the hands of unrestricted (free-float) shareholders. Hence, the control group represents R3000 constituents that have more than 25% of the voting rights in public hands.

¹¹ One exception is made for the control group which event date took place at June 12th, 2018 (see section 4.1).

Variable definitions

In exhibit 1 the panel data set will be briefly explained with the variables that are used for this research. The Public Voting Power variable is obtained through FTSE Russell's indicative list of affected securities. All other variables are obtained via Datastream database.

Sample properties

Table 3 provides descriptive statistics for the entire sample and treatment and control subsamples of the main numerical variables that are used for this research. For a description of these variables see exhibit 1. For the Public Voting Power variable of the treatment group, a distinction is made between index constituents and non-constituents¹². The mean and median public voting rights percentage is relatively lower for the non-constituent category (6.69% and 2.96%) compared to the constituent category (14.60% and 15.68%). This is due to the fact that the non-constituent firms included in the indicative list are mostly not (yet) included in the index because of not meeting the required 5% hurdle rate. However, the non-constituent category also contains companies that meet the 5% hurdle rate but are not included because of other eligibility criteria like market capitalization. Furthermore, what stands out is that although the hurdle rate is set at 5%, the sample mainly consists of companies with a higher public voting rights percentage than 5%. These firms are also included in the indicative list as they could be excluded from these indexes in the near future as FTSE Russell annually reviews the magnitude of the hurdle rate between 5 and 25% (FTSE Russell, 2017).

Table 3 Descriptive statistics total, treatment, and control sample

Variables	Unit of obs	N Obs	Mean	Std Dev	Min	5th Perc	Median	95th Perc	Max
Leverage	Percentage	5,392	26.09	21.92	0.00	0.00	23.59	66.55	153.47
- Treatment		283	24.21	22.92	0.00	0.00	19.40	65.42	103.87
- Control		5,109	26.19	21.86	0.00	0.00	23.78	66.56	153.47
Listing Age	Years	5,392	20.70	14.37	0.80	2.10	19.40	45.50	53.50
- Treatment		283	16.67	14.21	1.00	1.30	15.30	45.50	45.60
- Control		5,109	20.92	14.35	0.80	2.30	19.70	45.50	53.50
Market To Book	Ratio	5,392	4.01	22.89	-478.86	0.61	2.12	12.39	758.81
- Treatment		283	5.37	57.13	-478.86	0.37	2.00	21.86	758.81
- Control		5,109	3.94	19.30	-252.87	0.63	2.12	12.02	540.01
Market Value	Million USD	5,392	10,180.95	38,345.64	8.58	196.19	1,769.52	40,348.86	945,082.20
- Treatment		283	2,453.36	5,414.35	8.58	56.38	721.09	12,666.44	39,532.76
- Control		5,109	10,609.00	39,328.64	89.19	206.29	1,848.03	42,344.09	945,082.20
Public Voting Power (Treatment)	Percentage	283	13.82	7.54	0.00	0.00	15.07	23.87	25.00
- Non-Constituent		28	6.69	8.45	0.00	0.00	2.96	24.40	25.00
- Constituent		255	14.60	7.02	0.00	0.00	15.68	23.87	25.00
Return On Equity	Percentage	5,392	-5.26	220.48	-9,294.79	-84.64	8.73	46.00	2,859.01
- Treatment		283	-14.29	145.29	-1,575.36	-93.22	8.73	51.94	152.43
- Control		5,109	-4.76	223.90	-9,294.79	-84.57	8.73	45.72	2,859.01

Note: This table shows descriptive statistics for the total sample and treatment and control subsamples at event date $t=0$. Per variable is indicated in which unit of observation the variable is listed. The only variable that shows 283 observations at $t=0$ instead of 5,392 is the variable Public Voting Power. This is due to the fact that for this variable only the observations for the treatment group are available. The Public Voting Power for the control group is not available as these firms are not included in the indicative list of affected securities. Because of that it can only be derived that these firms have more than 25% public voting power.

¹² These non-constituents are firms added to the indicative list of affected securities that could potentially enter one of FTSE Russell's indices but are not (yet) included in one of FTSE Russell's affected indices based on the most recent index review.

Next to these numerical variables, the dataset also contains for each sample firm a FTSE Industry Classification Benchmark (ICB). FTSE ICB divides companies between 10 industry categories. For an overview of the sample ICB category distribution, see exhibit 2.

4. Empirical model

4.1 Event study methodology

The aim of this research is to investigate whether index providers could be a right source of regulation to incentivize companies to alter their unequal voting rights structures. This will be examined by observing (potentially) affected companies' stock price behavior around FTSE Russell's hurdle rate decision. In order to answer what effect this hurdle rate decision has on shareholder value of (potentially) excluded firms, this paper applies the short-term event study methodology. This methodology enables to determine whether there is an abnormal price reaction to this hurdle rate decision. In case there is an abnormal price effect, this might give the affected companies incentives to alter their unequal voting right share structure or deter private/public companies from issuing unequal voting right shares to the public.

According to MacKinlay (1997), the purpose of an event study is to measure the effect of an economic event on a company's market value. MacKinlay provides three essential steps to execute an appropriate event study, which this paper will use as a framework. These steps are: 1. Define the event of interest and the estimation and event window; 2. Define a normal (benchmark) return; 3. Calculate and analyze abnormal returns at and surrounding the event date(s). Unless otherwise stated, the formulas in this section are obtained from de Jong and de Goeij's lecture notes (2011).

Event of interest and estimation and event window

The events of interest for this study are the trading dates at which firms are added to the indicative list of affected securities¹³. This event of interest is divided into two event dates categories. The first event date category is the initial announcement date of the hurdle rate eligibility criterium at which FTSE Russell published the indicative list of affected securities for the first time (July 26th, 2017). The second event date category entails five calendar dates at which companies are added to this list after the initial announcement date (between June 2018 and February 2019). Decided is to choose as event date one trading day following the actual announcement day as it is not perfectly clear if the announcements took place during or after trading hours.

¹³ For a definition of this indicative list of affected securities see section 3 'Institutional details and dataset'.

In order to ensure that the event of interest will be measured, for both groups, the event window will be 7 trading days long and starts 1 trading day prior, and ends 5 trading days subsequent to the event date ($t=0$). Next to that, the estimation window starts and ends respectively 240 and 31 trading days prior to the event date ¹⁴. This means an estimation window of 210 trading days. The gap of 30 trading days between the end of the estimation window and the event date is applied to prevent the event from influencing the normal return parameter estimates. Noteworthy is that there are only two event dates (July 27th, 2017 and June 12th, 2018) for the control group. One control group covers the initial announcement while the other covers the second event date category. June 12th, 2018 is chosen as event date for the control group for the second event date category because at this date the most firms are added to the indicative list (treatment group) as this update was part of an annual index review.

Benchmark return

A critical part of the event study methodology is to specify a benchmark model that predicts normal returns. This is critical as the reliability of the abnormal returns is highly dependent on the accuracy of this model. These normal returns are the expected returns without conditioning on the event taking place. This research makes use of the ‘Market Model’ to function as the benchmark. The market model is a simple linear OLS regression which accounts for differences in systematic risk across stocks. The market model is defined as follows (eq. 1):

$$R_{i,t} = \alpha_i + \beta_i * R_{m,t} + \varepsilon_{i,t} \quad (1) \quad \text{Where}$$

$$E(\varepsilon_{i,t}) = 0 \quad \& \quad \text{var}(\varepsilon_{i,t}) = \sigma_{\varepsilon_i}^2$$

In this regression, $R_{i,t}$ and $R_{m,t}$ are the daily logarithmic returns on stock i and the market portfolio m at time t respectively. α_i , β_i and $\sigma_{\varepsilon_i}^2$ represent the parameters of the model. As the market portfolio, the broad-based S&P1500 composite index is used which covers roughly 90% of the total US equity market capitalization (Standard & Poor’s [S&P], 2019). Someone might prefer one of FTSE Russell’s indices as the benchmark as this paper only considers FTSE Russell index companies. However, these indices are not commonly applied in the literature as the market portfolio. Therefore, the S&P1500 index is used which is a commonly used proxy for the return on the overall US equity market.

The market model (eq 1) is estimated over the estimation window. Afterward, the normal returns (NR) are predicted over the event window based on the estimated parameters (eq. 2).

¹⁴ Regarding the estimation window, one exception is made for the control group which event occurs at June 12th 2018. As the majority of this control group is also included in the control group of the initial announcement (July 27th 2017), the estimation window is narrowed down to 185 days prior to the event instead of 240. In this way the estimation window will not overlap with the prior event window.

$$\widehat{NR}_{i,t} = \hat{\alpha}_i + \hat{\beta}_i * \hat{R}_{m,t} \quad (2)$$

Where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the OLS-estimates of the regression parameters and $\widehat{NR}_{i,t}$ is the stock-specific expected normal return at time t .

Calculating and analyzing abnormal returns

The final step according to MacKinlay (1997) is to compute and analyze whether abnormal returns occur, at or surrounding the event date, that are statistically different from zero. After having computed the normal returns, the abnormal return for stock i at time t is obtained by subtracting the normal return from the actual return (3). Another way to look at the abnormal returns is as prediction errors of the market model (see Eq. 2).

$$AR_{i,t} = R_{i,t} - \widehat{NR}_{i,t} \quad (3)$$

To enhance causal inference of the event of interest on the stock price's abnormal return it is better to aggregate stock-specific abnormal returns. In this way information unrelated to the event on the stock prices are canceled out on average. This lead to a cross-sectional average abnormal return which is defined below (4).

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (4)$$

Where $AR_{i,t}$ is the abnormal return for stock i on event time t and N is defined as the number of events in the sample.

As mentioned before, the trading day following the addition date is defined as the event time $t = 0$ as it is not perfectly clear whether additions took place during or after trading hours. This fact and the possibility of slow diffusion of information to the market makes it of great interest to consider the Cumulative Abnormal Return (CAR) which covers parts of or the entire event window (5). Besides that, this CAR enables to see whether there are any anticipation effects preceding the event date. This could be possible as investors might already anticipate on an expected addition to the indicative list and hence a (potential) index exclusion.

$$CAR(t_1, t_2)_i = AR_{i,t_1} + \dots + AR_{i,t_2} = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (5)$$

Where the abnormal returns for stock i are aggregated from the start of the event period t_1 up to time t_2 .

For similar reasons as the AAR_t , it is of great importance to bundle the cumulative abnormal returns over the cross-sectional dimension for any interval in the event window, which results in the Cumulative Average Abnormal Return (CAAR) (6).

$$CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^N CAR(t_1, t_2)_i \quad \text{or} \quad CAAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AAR_t \quad (6)$$

Statistical significance and addressing complications

In order to determine whether there is an abnormal price effect caused by FTSE Russell hurdle rate decision, it is important to test for statistical significance of abnormal returns. In general, under the null hypothesis, the (cumulative) abnormal returns are on average not statistically significantly different from zero ($H_0 : E(AR_{i,t}) = 0$ & $H_0 : E(CAR_i) = 0$).

The first basic test into consideration for this research assumes that abnormal returns are independently, identically and normally distributed. This test statistic is shown below for the AAR_t (7) and the $CAAR$ (8).

$$TS_{1,t} = \sqrt{N} \frac{AAR_t}{s_t} \approx N(0,1) \quad (7) \quad \text{Where} \quad s_t = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (AR_{i,t} - AAR_t)^2}$$

$$TS_2 = \sqrt{N} \frac{CAAR}{s} \approx N(0,1) \quad (8) \quad \text{Where} \quad s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (CAR_i - CAAR)^2}$$

The test statistic mentioned above assumes that ARs are uncorrelated between two different event observations (*i.e.* $Cov(AR_{i,t}, AR_{j,t}) = 0, i \neq j$). Violation of this assumption leads to cross-sectional dependence of ARs. This, in turn, results in a downward biased usual variance estimator (s_t and s) of equations 7 and 8 what could lead to upward biased and thus invalid t-statics. In this paper's research setting it is important to consider this potential problem of cross-sectional dependence due to event clustering as many events occur at the same calendar day (especially for the initial announcement). Due to this calendar clustering, it is more likely that abnormal returns are cross-sectionally correlated, which therefore could lead to incorrect conclusions when not addressing this potential implication.

In order to address this potential issue, this study will additionally consider the 'crude dependence method' proposed by Brown and Warner (1980) to test statistical significance (see eq. 9). In their method, they estimate the variance of the AARs directly from the time series of observations of AARs in the estimation period instead of the event period (as in equation 7 and 8).

$$TS_{3,t} = \frac{AAR_t}{\bar{s}} \approx N(0,1) \quad \text{Where} \quad \bar{s} = \sqrt{\frac{1}{T-1} \sum_{t=T_1}^{T_2} (AAR_t - AR^*)^2}$$

$$\& \quad AAR_t = \frac{1}{N} \sum_i^N AR_{i,t} \quad \& \quad AR^* = \frac{1}{T} \sum_{t=T_1}^{T_2} AAR_t \quad (9)$$

Where AR^* is the overall average of the ARs over the estimation window and AAR_t is the cross-sectional average AR at time t . Regarding the CAARs, a similar test will be conducted (10).

$$TS_4 = \frac{1}{\sqrt{T}} \frac{CAAR}{s} \approx N(0,1) \quad (10)$$

One of the main assumptions made by test statistics 1 to 4 (see equations 7-10) is that the abnormal returns are normally distributed. However, the event study will also be applied to the Public Voting Power category subsamples in order to see whether firms that are closer to the 5% hurdle rate react differently compared to firms that are further away from this hurdle rate. This normality assumption could potentially be violated for these Public Voting Power subsamples as they only contain between 19 and 41 event observations per category per event date category. Therefore an additional non-parametric rank test will be executed that takes into account the magnitude and sign of the abnormal returns (Corrado, 1989). This test is more robust against abnormal return outliers and is expected to converge more quickly towards a normal distribution. Therefore, this test is more appropriate for (sub)samples with fewer observations.

The rank test is defined as following (11):

$$TS_5 = \sqrt{N} \left[\frac{1}{N} \sum_{i=1}^N \frac{U_{i,t} - 0.5}{s_{u,t}} \right] \approx N(0,1) \quad \text{with} \quad s_{u,t} = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (U_{i,t} - 0.5)^2} \quad (11)$$

Denote the rank of the abnormal return $AR_{i,t}$ in the whole time series (estimation and event window) of abnormal returns by $K_{i,t}$. This rank is transformed into the test statistic $U_{i,t} = K_{i,t} / T$.

4.2 Cross-sectional multivariate regression analysis of abnormal returns

Besides the event study itself, an additional multivariate linear Ordinary Least Squares (OLS) regression will be conducted for both event date categories to improve the understanding and identification of what effect the hurdle rate decision has on shareholder value of (potentially) excluded companies. The baseline regression follows below.

$$CAR_i = \beta_1[0 - 5\%]_i + \beta_2(5 - 25\%)_i + \beta_3(> 25\%)_i + \beta_4[0 - 5\%] * \text{non-constituent}_i + \beta_5(5 - 25\%) * \text{non-constituent}_i + \varepsilon_i$$

The CAR of event i in the event window $[0,1]$ will be used as the dependent variable. Coefficients β_1, β_2 and β_3 represent dummy variables that take the value of 1 when a firm has a specific voting right percentage in public hands within a certain range. The public voting right categories 2-5 ((5-25%)) are aggregated and category 1 ([0-5%]) and 6 (>25%) are included individually. This is done as category 1 is the most likely affected category and category 6 (control group) is the least likely affected category by the hurdle rate. The constant is excluded to show the effect of every category. Furthermore, for the second event date category two interactive dummies (β_4 and β_5) are included in the regression. These dummies give the difference in average CAR for the groups [0-5%] and (5-25%) between being an index

constituent or not at the time of addition to the indicative list. These interaction dummies (β_4 and β_5) will not be included in the OLS regression for the first event date category as this category only contains constituents in the sample. β_4 , which represents firms that have 5% or lower public voting rights and were not a constituent of one of FTSE Russell's affected indices at the time of addition to the indicative list, is the most important coefficient of interest as these firms are the most affected as they are not grandfathered for a period of 5 years, unlike existing constituents with 0 to 5% public voting right. These coefficients enable to examine whether there are statistically significant differences across the categories and being a constituent (and hence grandfathered for 5 years) or not. Next to this baseline regression, the other regressions will be extended by including ICB dummies to control for industry-fixed effects. Finally, unlike Winden and Baker who only control for systematic risk and industry-fixed effects, the other regressions will be extended with firm-specific control variables. The control variables that will be included are Market Value (MV), Leverage ratio, Return On Equity (ROE), Market to Book ratio and Listing age. These variables will be included as interactive dummies together with the Public Voting Power categories as in the baseline regression (see β_1, β_2 and β_3). In this interaction, the control variables are included as dummies where they take the value of 1 when a firm is above the median sample value for that specific variable¹⁵. Including these interactive dummies helps to analyze whether the abnormal price reaction on the hurdle rate decision per Public Voting Power category on average differs with firm characteristics.

Testing for heteroskedasticity

In order to use OLS as the estimation method, there are important assumptions that need to be made. One of the main assumptions, in order to label the estimators as Best Linear Unbiased Estimators (BLUE), is the assumption of homoscedasticity. This assumption entails that the variance of the error u is constant and finite for any value of the explanatory variables ($Var(u|x_1, x_2, \dots, x_k) = \sigma^2 < \infty$). In case this assumption is violated, there is the presence of heteroskedasticity which could lead to a bias in the standard errors. In order to know whether there is heteroskedasticity present in the regressions, the Breusch-Pagan/Cook-Weisberg test will be executed to test for heteroskedasticity. In case the null hypothesis of homoscedasticity is rejected, then robust standard errors will be applied to test for statistical significance of the estimated OLS coefficients. These robust standard errors ensure unbiased standard errors. The test results are included in appendix 3.

¹⁵ Initially, the regressions are executed with the firm-specific control variables included as continuous variables within these interactive dummies. However, after plotting scatterplots and running the regression in this way, it seems that it makes less sense to include these control variables as continuous variables as there is almost no linear relationship between the CAR and these control variables. By including them as dummy variables with a distinction between above and below median, the adjusted R^2 improved and the interactions are individually and jointly more significant.

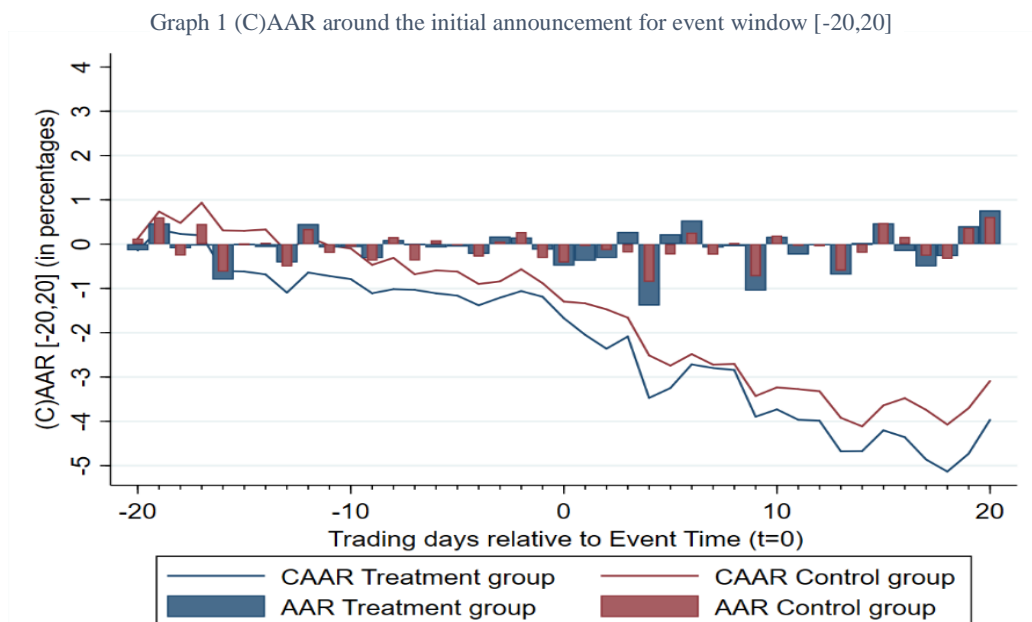
5. Empirical results

5.1 Initial hurdle rate announcement – Event date category 1

This subsection provides the event study results of the initial announcement. Before moving on to the event study results, first two indicative graphs will be depicted to get a first glance at how the treatment and control group responded to FTSE Russell's initial announcement of the hurdle rate.

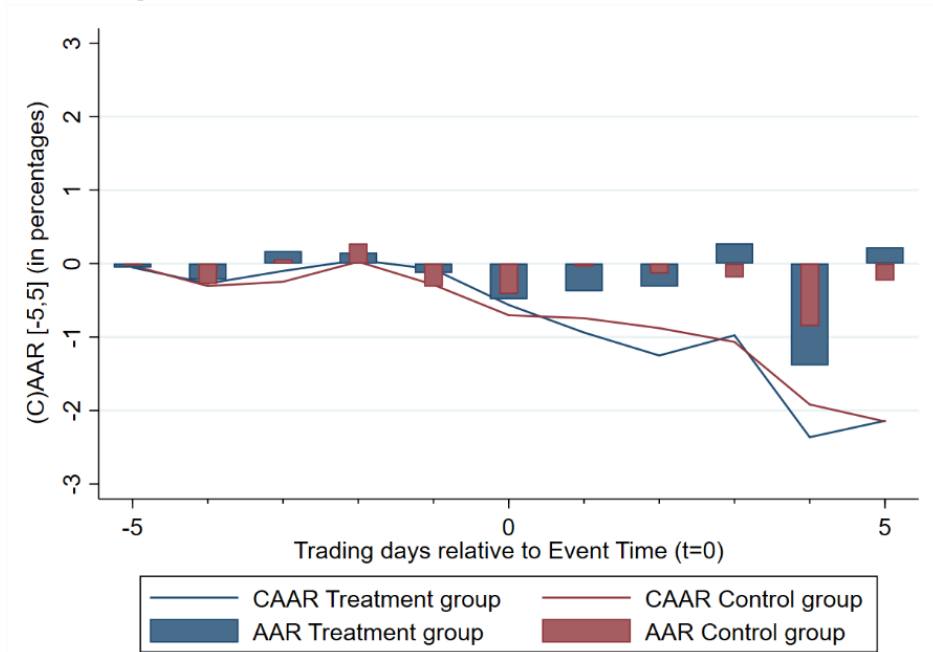
Event study

Graph 1 and 2 show the average abnormal and cumulative abnormal returns for the initial announcement for the treatment and control group for the event windows $[-20,20]$ and $[-5,5]$ respectively. At a first glance, according to graph 1, it seems that the treatment and control group are moving in the same direction and that there is no big difference in cumulative abnormal price reaction to the initial announcement of the hurdle rate. Both groups' stock prices on average respond negatively to the initial hurdle rate announcement around July 26th, 2017. Looking more specifically around the event date, considering the event window $[-5,5]$, graph 2 confirms that the cumulative abnormal price reaction is approximately equal for the treatment and control group. Considering event time $t=0$, $t=1$, $t=2$, the treatment group responds slightly more negative than the control group. Noteworthy is the treatment group AAR on event time $t=4$. It is hard to explain a price reaction of this magnitude as it occurs 4 trading days after the event of interest. Hence, this could potentially be related to another event which is of no interest in this research. Overall, these graphs suggest that the investment community of both the treatment and control group perceive FTSE Russell's imposed hurdle rate as negative news, resulting in a negative average abnormal stock price response.



Note: This figure depicts the AAR and CAAR in the event window $[-20,20]$ for the first event date category. The blue line and bars represent the treatment group whereas the red line and bars represent the control group. The horizontal axis shows the trading days relative to the event date $t=0$ and the vertical axis shows the magnitude of the AAR and CAAR in percentages.

Graph 2 (C)AAR around the initial announcement for event window [-5,5]



Note: This figure depicts the AAR and CAAR in the event window [-5,5] for the first event date category. The blue line and bars represent the treatment group whereas the red line and bars represent the control group. The horizontal axis shows the trading days relative to the event date $t=0$ and the vertical axis shows the magnitude of the AAR and CAAR in percentages.

Table 4 shows the event study results for the initial announcement including (cumulative) mean abnormal returns and test statistics based on TS1 to TS5 (see section 4). Besides a distinction between treatment and control group, another distinction is made within the treatment group for the Public Voting Power categories.

Solely considering the entire treatment group, on event time $t=0$ (the trading day after hurdle rate announcement) an AAR of -0.48% appears which is statistically different from zero at the 1% confidence interval (CI) in accordance to the t-test and rank test. An approximately equal negative AAR of -0.41%, which is statistically significant at 1% CI based on only the t-test, appears for the control sample on the same day. However, based on the rank test, the AAR for the control group lacks statistical significance. Besides that, based on the crude dependence adjustment test statistic both these groups' AARs are not statistically significant, indicating that there might be cross-sectional dependence of ARs.

The treatment group AAR differs from the S&P1500 treatment group AAR of Winden and Baker (2018) as they find an insignificant positive AAR of 0.44% for their treatment group based on the t-test the trading day following S&P's announcement. However, it needs to be noted that they apply a different market portfolio return and, unlike this research, already control for industry-fixed effects within the abnormal return calculation. Furthermore, their treatment group is different as it includes dual-class firms that will not be included to the S&P indices (not grandfathered), whereas this initial announcement treatment group consists of firms that are grandfathered for 5 years and therefore not immediately subject to the new eligibility criterium.

Consequently, the cross-sectional dependence also tends to be present for the CAARs of the treatment and control group of event windows $[-1,1]$, $[0,1]$ and $[0,2]$ which are all not statistically different from zero based on the crude dependence adjustment test.

Regarding the Public Voting Power categories, based on the t-test and rank test only the categories 1 ($[0,5\%]$), 2 ($(5-10\%)$) and 3 ($(10-15\%)$) are statistically significant at event time $t=0$ on at least the 10% CI with AARs of -0.74% , -0.93% and -0.86% respectively. However, when considering the crude dependence adjustment test statistic neither one of these categories is significant, again suggesting cross-sectional dependence of ARs at event time. Furthermore, regardless of statistical significance, for $t=0$ it seems that categories that are further away from the 5% hurdle rate experienced less negative or even positive average abnormal returns compared to categories that are closer to the hurdle rate. Besides, what stands out is that for category 2 and 3 the mean CARs are highly negative and statistically significant based both on the t-test and the crude dependence adjustment. For category 2 and 3 the mean CAR of event window $[0,1]$ is respectively -2.45% (at 1% significance) and -1.92% (at 5% significance).

Table 4 Event study results initial announcement - Event date category 1

Event date category 1		Treatment group		Treatment group divided into Public Voting Power categories										Control group	
Group	Public Voting Power	1-5		1	2	3	4	5	6						
	N event obs	[0-25%]		[0-5%]	(5-10%]	(10-15%]	(15-20%]	(20-25%]	>25%						
		128		19	25	21	30	33	2,500						
		Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat
AAR (t=-1)	T-stat	-0.1269	-0.863	-0.3276*	-1.8769	-0.3559	-0.8565	0.0408	0.0768	-0.1025	-0.5255	0.0333	0.1286	-0.3137***	-6.7693
	Crude dep. Adjust.	-0.1269	-0.2892	-0.3276	-0.5147	-0.3559	-0.5402	0.0408	0.0603	-0.1025	-0.1504	0.0333	0.05627	-0.3137	-0.7930
	Rank test	-0.1269	-0.7107	-0.3276*	-1.7902	-0.3559	-0.3678	0.0408	0.5988	-0.1025	-0.1326	0.0333	-0.1993	-0.3137	-0.8041
AAR (t=0)	T-stat	-0.4849***	-3.2188	-0.7375***	-2.7275	-0.9250***	-3.1475	-0.8567**	-2.4583	-0.6201*	-1.6668	0.3534	1.2986	-0.4146***	-7.7738
	Crude dep. Adjust.	-0.4849	-1.1052	-0.7375	-1.1587	-0.9250	-1.4039	-0.8567	-1.2649	-0.6201	-0.9100	0.3534	0.5978	-0.4146	-1.0480
	Rank test	-0.4849***	-2.8976	-0.7375***	-3.0657	-0.9250***	-2.5843	-0.8567*	-1.7000	-0.6201	-0.6454	0.3534	0.8310	-0.4146	0.3247
AAR (t=1)	T-stat	-0.3755	-1.4456	0.0192	0.0590	-1.5236*	-1.9378	-1.0652	-1.0636	-0.2176	-0.8158	0.5624*	1.8663	-0.0409	-0.7675
	Crude dep. Adjust.	-0.3755	-0.8559	0.0192	0.0301	-1.5236**	-2.3123	-1.0652	-1.5727	-0.2176	-0.3194	0.5624	0.9514	-0.0409	-0.1033
	Rank test	-0.3755	-0.2223	0.0192	0.4195	-1.5236	-1.4893	-1.0652	-0.5394	-0.2176	-0.6788	0.5624*	1.9465	-0.0409	0.3247
CAAR [-1,1]	T-stat	-0.9873***	-2.6932	-1.0460**	-1.9988	-2.8046***	-2.7812	-1.8811*	-1.7686	-0.9402	-1.6305	0.9491*	1.7004	-0.7691***	-8.9643
	Crude dep. Adjust.	-0.9873	-1.2992	-1.0460	-0.9488	-2.8046**	-2.4575	-1.8811	-1.6035	-0.9402	-0.7966	0.9491	0.9269	-0.7691	-1.1226
CAAR [0,1]	T-stat	-0.8604**	-2.5656	-0.7183	-1.4975	-2.4486**	-2.5178	-1.9219*	-1.9230	-0.8377*	-1.6852	0.9159**	-1.9608	-0.4554***	-6.2724
	Crude dep. Adjust.	-0.8604	-1.3867	-0.7183	-0.798	-2.4486***	-2.6278	-1.9219**	-2.0065	-0.8377	-0.8693	0.9159	1.0954	-0.4554	-0.8141
CAAR [0,2]	T-stat	-1.1738***	-3.3147	-0.8013*	-1.8974	-2.4375**	-2.0061	-2.0624***	-2.7852	-1.2215**	-1.9611	0.1780	0.4227	-0.5900***	-6.7521
	Crude dep. Adjust.	-1.1738	-1.5446	-0.8013	-0.7268	-2.4375**	-2.1358	-2.0624*	-1.7580	-1.2215	-1.0350	0.1780	0.1738	-0.5900	-0.8612
CAAR [0,5]	T-stat	-2.0621***	-3.4795	-0.6321	-1.05523	-3.0408*	-1.7911	-3.4037***	-3.9693	-4.0047***	-3.0378	0.4759	0.5042	-1.8604***	-14.3841
	Crude dep. Adjust.	-2.0621*	-1.9187	-0.6321	-0.4054	-3.0408*	-1.8841	-3.4037**	-2.0515	-4.0047**	-2.3994	0.4759	0.3287	-1.8604*	-1.9201

Note: This table represents the event study results for the first event date category (initial hurdle rate announcement). The (Cumulative) Average Abnormal Returns ((C)AAR) of the treatment and control group are given in percentages. The treatment sample is divided into five Public Voting Power categories. Besides the standard t-test statistic (TS1 and TS2), the t-test statistic with the crude dependence adjustment (TS3 and TS4) and the rank test statistic (TS5) are given. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Cross-sectional multivariate OLS regression

Table 6 shows the parameter estimates of the OLS regressions for the initial announcement (event date category 1) where the Public Voting Power categories 1 (treatment), 2-5 (treatment) and 6 (control) are related as dummies to the dependent variable CAR in the event window [0,1]. Besides that, regressions (2)-(8) condition for industry-fixed effects. Additionally, regression (3) includes interactive dummies between the Public Voting Power categories and firm-specific control variables which take the value of 1 when the firm is above the median sample value for that specific control variable. These interactive variables are included separately in the regressions (4)-(8). This is done as the number of treatment firms is relatively small and therefore too many restrictions might be imposed on this regression. Noteworthy is that this sample only contains index constituents. Hence, these firms are grandfathered for a period of 5 years starting from the initial announcement date.

Table 5 provides two-tailed t-tests that tests whether the parameter estimates of the treatment Public Voting Power categories in the regressions (1) and (2) of table 6 are statistically significantly different from the control group. Considering firms that have between 0 and 5% public voting right, which is the most likely affected group by the hurdle rate after the grandfathering period, on average they do not statistically significantly differ from the control group as the p-values are higher than 10%. However, based on regression (2), after controlling for industry-fixed effects, treatment firms that have between 5 and 25% public voting right are statistically significantly different from the control group (P-value of 7%). Hence, this suggests that treatment firms between 5 and 25% on average experienced statistically significantly lower CARs to the initial hurdle rate announcement than the control firms, holding other factors fixed. However, overall these results mainly confirm graphs 1 and 2 that for the initial announcement the treatment and control group experienced approximately equal negative abnormal returns.

Table 5 Statistical significance of differences across Public Voting Power categories - Event date category 1

Dependent variable	CAR[0,1]		CAR[0,1]	
Regression	(1)		(2)	
Hypothesis H0	Difference	P-value	Difference	P-value
Cat. 1 -/- Cat. 6 = 0	-0.26	0.59	-0.28	0.59
Cat. 2-5 -/- Cat. 6 = 0	-0.43	0.26	-0.68*	0.07

Note: This table provides two-tailed t-tests that test whether the differences in parameter estimates of the treatment group categories as provided in table 6 are statistically significantly different from the control group. Recall that category 6 is the control group whereas categories 1 and 2-5 are the treatment group. *, ** and *** denote statistical significance at respectively the 10%, 5%, and 1% confidence interval.

Considering the interaction between the Public Voting Power categories and the firm-specific control variables, table 6 shows that the majority of these interactions are not statistically significant. However, what seems fairly convincing is the interaction between being in the treatment category 2-5 and having a listing age above the median. Based on regression (8), a firm that belongs to this treatment category and that is publicly listed for a period of time above the sample median, experienced on average a 2.19 percentage point higher CAR than a firm that is publicly listed for a period of time below the sample median, holding other factors fixed. This interaction is statistically significant at the 1% confidence interval. Hence, for this treatment category, it suggests that young publicly listed firms on average experienced lower CARs than old publicly listed firms, *ceteris paribus*. In terms of the sign, this finding also holds for category 1. However, the interaction with this category lacks statistical significance. Supplemental regressions on the subsamples above and below median listing age confirm that within this category 2-5 the younger publicly listed firms experienced on average lower negative CARs than older publicly listed firms (see table 13, exhibit 4).

Besides a different response between old and young publicly-listed treatment firms, there also seems to be a statistically significant (10% CI) difference between large and small market capitalization treatment firms. To illustrate this, a firm that belongs to the treatment category 2-5 and that has a market value above the median sample value experienced on average a 1.11 percentage point higher CAR than a firm that is below the sample median, *ceteris paribus*. Therefore, this might indicate that the threat of a potential exclusion is of more importance for investors of small firms than investors of big firms. This interaction also holds for category 1. However, this interaction lacks statistical significance. Supplemental regressions on the subsamples above and below median market value confirm this finding (see table 14, exhibit 4).

In summary, it is difficult to draw any hard conclusions from abovementioned initial announcement results as most of the average abnormal returns might be influenced by cross-sectional dependence. Additionally, recall that the results of the treatment group could be biased as they might be influenced by possible wrong allocation to this group. As mentioned before, it is not perfectly clear which firms were added to the first publication and which to the subsequent update of the indicative list of affected securities. Hence, this could mean that the treatment group includes companies that are not yet added to the indicative list at the initial announcement date of the hurdle rate. However, regardless of these implications, it seems that small and/or young publicly-listed treatment firms experienced a more adverse cost of capital effect than big and/or old publicly-listed treatment firms.

Table 6 Multivariate OLS regression results - Event date category 1

Dependent variable	CAR[0,1]							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Publ. Vot. Cat. 1 [0-5%]	-0.72 (0.48)	-0.89 (0.63)	-1.28* (0.74)	-1.18* (0.67)	-0.95* (0.55)	-0.36 (0.78)	-1.62* (0.88)	-1.26 (0.79)
Publ. Vot. Cat. 2-5 (5-25%]	-0.89** (0.38)	-1.29*** (0.50)	-2.21** (0.94)	-1.63*** (0.60)	-1.65** (0.73)	-1.24** (0.59)	-1.04* (0.60)	-2.18*** (0.63)
Publ. Vot. Cat. 6 (>25%) (Control)	-0.46*** (0.07)	-0.61* (0.34)	-1.01*** (0.38)	-0.86** (0.35)	-0.74** (0.35)	-0.70** (0.36)	-0.67* (0.36)	-0.73** (0.35)
Interactions								
Cat. 1 x Market Value (> median)			-0.12 (1.26)	0.97 (1.29)				
Cat. 2-5 x Market Value (> median)			1.12* (0.67)	1.11* (0.62)				
Cat. 6 x Market Value (> median)			0.37** (0.16)	0.43*** (0.15)				
Cat. 1 x ROE (> median)			-0.88 (1.32)		0.06 (1.01)			
Cat. 2-5 x ROE (> median)			0.67 (0.71)		0.70 (0.74)			
Cat. 6 x ROE (> median)			0.11 (0.16)		0.22 (0.15)			
Cat. 1 x Leverage ratio (> median)			-0.98 (0.97)			-1.08 (1.02)		
Cat. 2-5 x Leverage ratio (> median)			-0.45 (0.80)			-0.17 (0.76)		
Cat. 6 x Leverage ratio (> median)			0.07 (0.16)			0.14 (0.15)		
Cat. 1 x Market to Book (> median)			1.61 (1.26)				1.35 (1.02)	
Cat. 2-5 x Market to Book (> median)			-0.84 (0.80)				-0.57 (0.74)	
Cat. 6 x Market to Book (> median)			-0.01 (0.18)				0.13 (0.17)	
Cat. 1 x Listing Age (> median)			1.27 (1.27)					0.88 (1.01)
Cat. 2-5 x Listing Age (> median)			1.93*** (0.61)					2.19*** (0.65)
Cat. 6 x Listing Age (> median)			0.11 (0.15)					0.18 (0.14)
Industry (ICB) Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Base level: Basic Materials								
F-statistic	15.69***	10.65***	5.49***	8.87***	8.76***	8.60***	8.67***	9.02***
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R ²	0.02	0.06	0.07	0.06	0.06	0.06	0.06	0.06
Adjusted R ²	0.02	0.05	0.06	0.06	0.05	0.05	0.05	0.06
Total N Observations	2,628	2,628	2,628	2,628	2,628	2,628	2,628	2,628
- N Category 1	19	19	19	19	19	19	19	19
- N Category 2-5	109	109	109	109	109	109	109	109
- N Category 6	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500

Note: For all regressions as dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Three indicator variables are included that take the value of 1 when a firm belongs to that particular Public Voting Power category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%] public voting right) are aggregated into one dummy variable. Besides that, in regressions (2)-(8) Industry Classification Benchmark (ICB) dummies are included that control for industry-fixed effects. Furthermore, in regression (3) the firm-specific control variables are included as interactive dummies with the Public Voting Power categories. Within this interaction, the variables Market Value, ROE, Leverage ratio, Market To Book and Listing Age take the value of 1 when the firm has a value that is above the sample median. In regressions (4)-(8) these interactive variables are included separately. Furthermore, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity (see appendix). Finally, *, ** and *** denote statistical significance at respectively the 10%, 5%, and 1% confidence interval.

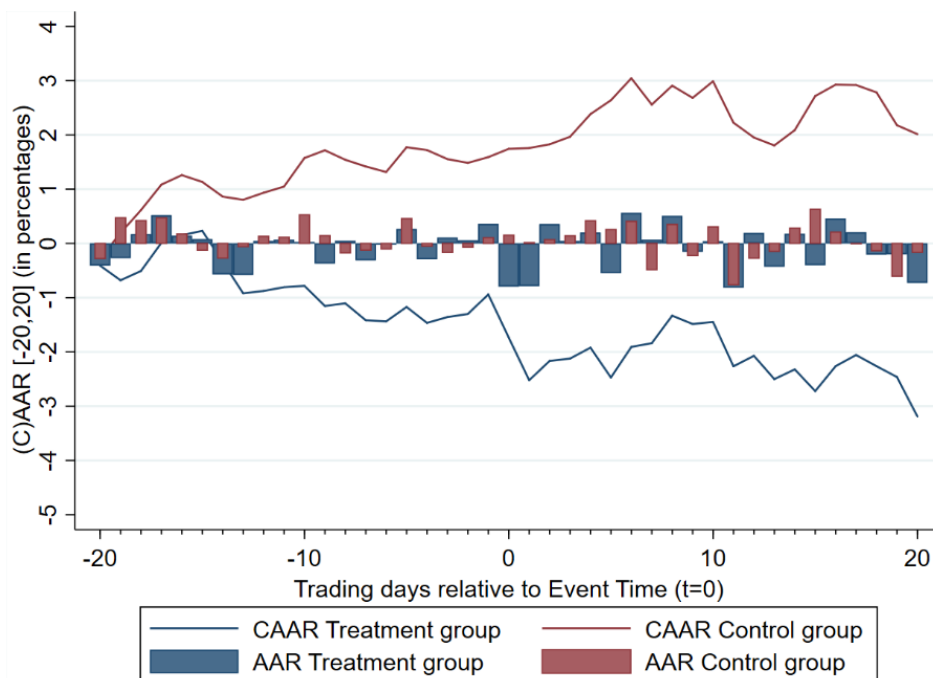
5.2 Addition after initial announcement – Event date category 2

This subsection provides the event study results of the second event date category. Recall that this event date category includes five calendar dates at which companies are added to the indicative list after the initial announcement date (between June 2018 and February 2019). Like for the initial announcement, firstly, two indicative graphs will be discussed after which the event study results and multivariate OLS regression will be discussed.

Event study

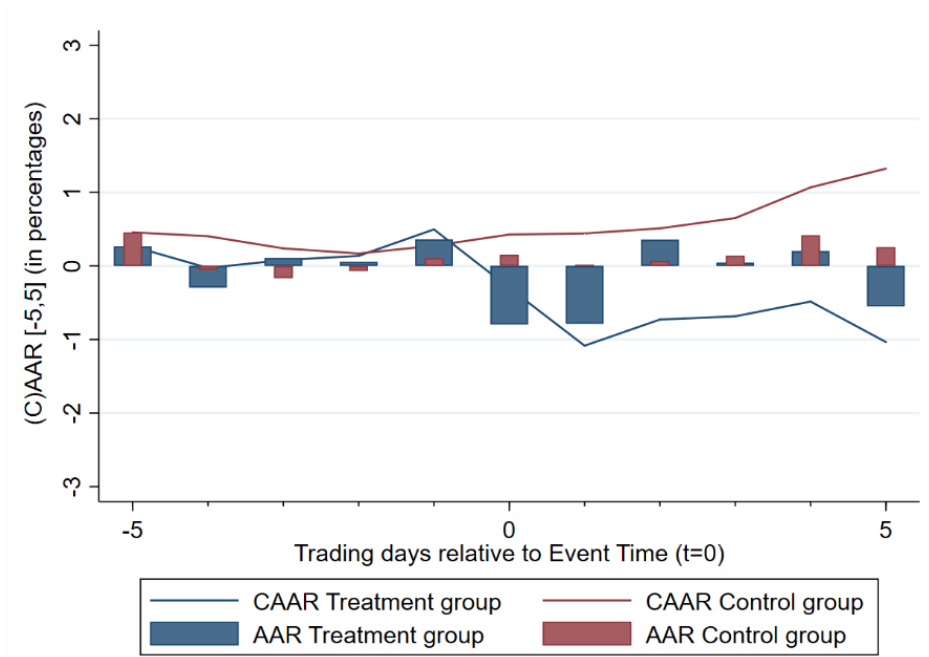
Graphs 3 and 4 depict the treatment and control group average abnormal and cumulative abnormal returns of the event date category 2 for the event windows $[-20,20]$ and $[-5,5]$ respectively. Considering graph 3, what seems interesting is that the CAAR of the treatment and control group diverge over time, unlike the initial announcement, thus moving in opposite directions. Considering event window $[-5,5]$, graph 4 indicates that the biggest divergence mainly occurs at event time $t=0$ and the subsequent trading day $t=1$, at which trading dates the treatment group appears to have a negative AAR of equal magnitude. The control group, however, seems to not respond on these event times. Consequently, as the control group is not exposed to this event as they are not added to the indicative list, this makes it more convincing that the negative AAR on $t=0$ and $t=1$ of the treatment group is caused by addition to the indicative list. In other words, this might suggest that (potential) exclusion of one of FTSE Russell's affected indices is on average penalized by the market, resulting in negative abnormal returns.

Graph 3 (C)AAR for event window $[-20,20]$ - Event date category 2



Note: This figure depicts the AAR and CAAR in the event window $[-20,20]$ for the second event date category. The blue line and bars represent the treatment group whereas the red line and bars represent the control group. The horizontal axis shows the trading days relative to the event date $t=0$ and the vertical axis shows the magnitude of the AAR and CAAR in percentages.

Graph 4 (C)AAR for event window [-5,5] - Event date category 2



Note: This figure depicts the AAR and CAAR in the event window [-5,5] for the second event date category. The blue line and bars represent the treatment group whereas the red line and bars represent the control group. The horizontal axis shows the trading days relative to the event date $t=0$ and the vertical axis shows the magnitude of the AAR and CAAR in percentages.

The event study results for the second event date category are included in table 7. Like table 4 for the initial announcement, this table includes the mean (cumulative) abnormal returns and test statistics based on TS1 to TS5 (see section 4). Next to a distinction between the treatment and control group, another distinction is made within the treatment group for the Public Voting Power categories. Additionally, unlike for the initial announcement, the first category [0-5%] has a subgroup of firms that have 5% or lower public voting right and were not a constituent of one of FTSE Russell's affected indices at the time of addition the indicative list, and therefore not grandfathered for a period of 5 years.

Considering the entire treatment group, on event time $t=0$ (the trading day after addition to the list) these firms experienced an AAR of -0.80%, which is statistically different from zero (at 1% and 5% confidence interval) based on every considered test statistic. The control group, however, experiences on the same event time an AAR of 0.15%, which lacks statistical significance based on the crude dependence adjustment and rank test. Besides that, the treatment group also experiences a statistically significant (at 1% and 5% confidence interval) negative AAR of -0.79% on $t=1$, whereas there is no statistically significant effect for the control group.

These negative mean ARs for the treatment group result in highly significant and negative CAARs of -1.22% (5% CI), -1.58% (1% CI) and -1.23% (5% CI) for the event windows [-1,1], [0,1] and [0,2] respectively. The CARs for the control group of the same event windows all lack statistical significance based on the crude dependence adjustment, which might indicate cross-sectional dependence of ARs for

the control group. This cross-sectional dependence is explainable as the events of the control group are clustered on the same calendar day.

Regarding the Public Voting Power categories, at event time $t=0$ the firms with 0-5% public voting rights and that are not an index constituent seem to be the most negatively affected based on a negative AAR of -1.62% which is statistically significant at the 5% confidence interval based on the t-test and crude dependence adjustment. However, based on the rank test this AAR is not statistically significant anymore. This category also has a substantial statistical significant negative mean AR at the 5% confidence interval on $t=1$ of -1.45%. However, this AAR lacks statistical significance based on t-test. Furthermore, what stands out is that category 1 (const. & non-const.), 3 and 4 also experience substantial statistically significant negative AARs of respectively -1.01%, -0.96% and -1.25% at $t=0$. However, category 1 (const. & non-const.) and 4 lack statistical significance based on the rank test. Besides that, on $t=1$ category 1 (const. & non-const.), 2 and category 3 also mainly experience negative statistical significant AARs. However, again these AARs are not significant on every test statistic.

Furthermore, there seems to be no clear pattern that firms that are closer to the 5% hurdle rate experience more negative AARs. For instance, at $t=0$ category 4 experienced a more negative AAR than category 2. However, notice that category 5 seems the least affected treatment category as it does not include any substantial negative AARs and lacks statistical significance. This might be caused by the fact that this category is quite far away from the 5% hurdle rate, and therefore not likely excluded due to the hurdle rate. The mean CARs confirm that indeed category 1 (non-constituent) seems to be penalized the most in terms of shareholder value as it has CAARs statistically significant (1% CI based on crude dependence adjustment) of -3.10%, -3.07%, and -3.29% for the event windows $[-1,1]$, $[0,1]$ and $[0,2]$ respectively.

Table 7 Event study results - Event date category 2

Event date category 2		Treatment group		Treatment group divided into Public Voting Power categories												Control group	
	Group Public Voting Power N event obs	1-5 [0-25%] 155		1 [0-5%] 27	2 (5-10%] 20	3 (10-15%] 24	4 (15-20%] 25	5 (20-25%] 38	6 (20-25%] 41							6 >25% 2,609	
				const + non-const		non-constituent											
		Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat	Mean	Test stat
AAR (t=-1)	T-stat	0.3595*	1.7482	-0.0822	-0.2890	-0.0249	-0.0770	0.3008	0.6675	-0.0310	-0.0552	0.9049*	1.8548	0.4175	1.0256	0.1057**	2.6979
	Crude dep. Adjust.	0.3595	1.0545	-0.0822	-0.1631	-0.0249	-0.0392	0.3008	0.3899	-0.0310	-0.0639	0.9049	1.4257	0.4175	0.7040	0.1057	0.2988
	Rank test	0.3595***	2.9629	-0.0822	-0.0879	-0.0249	0.1340	0.3008**	2.0174	-0.0310	0.9433	0.9049***	2.6367	0.4175	0.8127	0.1057	0.1652
AAR (t=0)	T-stat	-0.7952***	-3.7042	-1.0105*	-1.6052	-1.6209**	-2.1061	-0.6852	-1.2707	-0.9579***	-2.9701	-1.2473***	-2.6620	-0.1996	-0.5236	0.1522***	3.7689
	Crude dep. Adjust.	-0.7952**	-2.3322	-1.0105**	-2.0050	-1.6209**	-2.5505	-0.6852	-0.8879	-0.9579**	-1.9758	-1.2473**	-1.9652	-0.1996	-0.3366	0.1522	0.4303
	Rank test	-0.7952***	-3.5282	-1.0105	-0.9523	-1.6209	-1.4305	-0.6852	-1.3239	-0.9579***	-3.1268	-1.2473	-1.6245	-0.1996	-0.9202	0.1522	0.1937
AAR (t=1)	T-stat	-0.7856**	-2.1598	-1.0539	-1.4004	-1.4491	-1.4703	-1.1213**	-2.4035	-0.6481**	-2.0260	-0.7453	-0.5851	-0.5337	-1.4564	0.0145	0.3941
	Crude dep. Adjust.	-0.7856**	-2.3041	-1.0539**	-2.0910	-1.4491**	-2.2802	-1.1213	-1.4531	-0.6481	-1.3368	-0.7453	-1.1743	-0.5337	-0.9000	0.0145	0.0409
	Rank test	-0.7856***	-3.1652	-1.0539**	-2.2078	-1.4491**	-2.5078	-1.1213**	-2.0163	-0.6481***	-3.3196	-0.7453	-0.0429	-0.5337	-0.6947	0.0145	0.3221
CAAR [-1,1]	T-stat	-1.2213**	-2.4168	-2.1466*	-1.6866	-3.095**	-1.9687	-1.5056*	-1.9379	-1.6370**	-2.3894	-1.0877	-0.729	-0.3158	-0.4319	0.2723***	3.9343
	Crude dep. Adjust.	-1.2213**	-2.0680	-2.1466**	-2.4590	-3.095***	-2.8116	-1.5056	-1.1265	-1.6370*	-1.9495	-1.0877	-0.9894	-0.3158	-0.3075	0.2723	0.4446
CAAR [0,1]	T-stat	-1.5808***	-3.3945	-2.0644*	-1.6776	-3.0701**	-1.9815	-1.8065***	-2.5766	-1.6060***	-3.7049	-1.9927	-1.4278	-0.7333	-1.2725	0.1666***	3.0783
	Crude dep. Adjust.	-1.5808***	-3.2784	-2.0644***	-2.8963	-3.0701***	-3.4158	-1.8065*	-1.6553	-1.6060**	-2.3424	-1.9927**	-2.2200	-0.7333	-0.8744	0.1666	0.3332
CAAR [0,2]	T-stat	-1.2250**	-2.4424	-2.1057	-1.5195	-3.2857*	-1.9160	-0.9364	-1.0070	-1.0090	-1.0905	-1.8622	-1.3534	-0.3552	-0.5977	0.2356***	3.3696
	Crude dep. Adjust.	-1.2250**	-2.0743	-2.1057**	-2.4121	-3.2857***	-2.9849	-0.9364	-0.7006	-1.0090	-1.2016	-1.8622*	-1.6939	-0.3552	-0.3458	0.2356	0.3847
CAAR [0,5]	T-stat	-1.5308**	-2.3620	-2.3910	-1.3844	-3.9534*	-1.8026	-0.4605	-0.3564	-2.2521**	-1.9730	-2.0248	-1.1079	-0.6933	-0.9449	1.0477***	9.8521
	Crude dep. Adjust.	-1.5308*	-1.8329	-2.391*	-1.9367	-3.9534**	-2.5395	-0.4605	-0.2436	-2.2521*	-1.8965	-2.0248	-1.3023	-0.6933	-0.4773	1.0477	1.2095

Note: This table represents the event study results for the second event date category, treatment companies that are added to the indicative list after the initial announcement. The (Cumulative) Average Abnormal Returns ((C)AAR) of the treatment and control group are stated in percentages. The treatment sample is divided into six Public Voting Power categories. The first category ([0-5%]) is separated in a constituent + non-constituent group and a group with solely non-constituents. Besides the standard t-test statistic (TS1 and TS2), the t-test statistic with the crude dependence adjustment (TS3 and TS4) and the rank test statistic (TS5) are given. Finally, *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Cross-sectional multivariate OLS regression

The parameter estimates of the OLS regressions for the second event date category are shown in table 9. The OLS regressions are composed the same as for the initial announcement with one exception: two interactive dummies are included which have a difference-in-difference interpretation. These dummies give the difference in average CAR for both the treatment Public Voting Power categories 1 [0-5%] and 2-5 (5-25%] between being a non-constituent (not grandfathered) or constituent (temporarily grandfathered) at the time of addition to the indicative list.

Table 8 Statistical significance of differences across Public Voting Power categories - Event date category 2

Dependent variable	CAR[0,1]		CAR[0,1]		CAR[0,1]		CAR[0,1]	
Regression	(1)		(2)		(3)		(4)	
Hypothesis H0	Difference	P-value	Difference	P-value	Difference	P-value	Difference	P-value
Cat. 1 -/- Cat. 6 = 0	-2.23*	0.07	-2.31*	0.06	0.64	0.58	0.56	0.64
Cat. 2-5 -/- Cat. 6 = 0	-1.65***	0.00	-1.62***	0.00	-1.63***	0.00	-1.59***	0.00

Note: This table provides two-tailed t-tests that test whether the differences in parameter estimates of the treatment group categories as provided in table 9 are statistically significantly different from the control group. Recall that category 6 is the control group whereas categories 1 and 2-5 are the treatment group. *, ** and *** denote statistical significance at respectively the 10%, 5%, and 1% confidence interval.

For regressions (1)-(4), table 8 provides two-tailed t-tests that tests whether the parameter estimates of the treatment Public Voting Power categories in the regressions of table 9 are statistically significantly different from the control group. Considering firms that have between 0 and 5% public voting right (category 1), they do statistically significantly differ from the control group with p-values of 7% and 6% based on regression (1) and (2). Considering regressions (3) and (4), this significant difference disappears. However, the interpretation of the parameter estimate of category 1 changes in these regressions as this estimate now only represent index constituents. Hence, this means that index constituents with 0-5% public voting right did not experience statistically significantly different abnormal returns compared to the control group. These index constituents experienced on average even higher CARs than the control group.

According to regressions (3) and (4) in table 9, there is a statistically significant difference within category 1 between index constituents (grandfathered for 5 years) and non-constituents (not grandfathered). To illustrate this, based on regressions (3) and (4), a firm that has 5% or less public voting right and is not an index constituent at the time of addition to the indicative list, on average experienced a 3.88 percentage point lower CAR than a constituent within this category, ceteris paribus. These differences are statistically significant at the 5% confidence interval. In line with the event study results from table 7, it seems that on average the market penalized the firms the most that are immediately subject to the hurdle rate in terms of a high negative price reaction.

According to table 8, treatment firms that have between 5 and 25% public voting right experienced convincingly higher negative CARs than the control group. These differences are for all regressions (1)-(4) statistically significant at the 1% confidence interval. Considering the difference within this category (5-25%] between being an index constituent or not, there is no statistically significant difference at the time of addition to the list. Economically, this makes sense as a non-constituent firm, within this category, will be included in one of the indices when it meets the other eligibility criteria besides the hurdle rate. Therefore, unless FTSE Russell increases the hurdle rate, they are not really more affected than constituents within this category.

Regarding the interaction between the treatment categories and the firm-specific control variables, in line with the first event date category, it seems that small treatment firms experienced higher negative CARs than big treatment firms. To illustrate this, within category 1, a firm that has a market value that is above the sample median experienced on average a 3.58 percentage point higher CAR (at 5% CI) than a firm that has a market value below the sample median, holding other factors fixed.¹⁶ In terms of sign, this effect also holds for categories 2-5. However, this interaction is not statistically significant.

Furthermore, the OLS regressions indicate that treatment firms that are low or not profitable experienced on average higher negative CARs than firms that are highly profitable. According to regression (7), a firm within category 1 that has a Return On Equity (ROE) above the median sample value, experienced on average a 3.90 percentage point higher CAR (at 10% CI) than a firm within this category that has a ROE below the sample median, holding other factors fixed¹⁶. In terms of sign, this finding also holds for categories 2-5. However, this interaction is not statistically significant.

Finally, it seems that ‘growth’ firms (high market to book ratio) within categories 2-5 experienced higher negative CARs than ‘value’ firms (low market to book ratio). Based on regression (9), a firm within this category that has a market to book ratio above the sample median exhibits on average a 1.99 percentage point lower CAR (at 5% CI) than a firm within this category that has a market to book ratio below the median, *ceteris paribus*¹⁶. However, this finding seems not to hold for treatment category 1.

With regard to the control group, many interactive dummies turn out to be highly statistically significant. However, economically these findings are not really relevant as the control group is mainly included to infer whether the treatment group is statistically significantly different from the control group, and hence to better identify the effect of the hurdle rate decision on the treatment stocks’ AAR.

¹⁶ Tables 15,16 and 17 in exhibit 4 contain supplemental regressions that confirm the abovementioned findings. These regressions are executed on subsamples above and below the median sample value of these firm-specific control variables (market value, ROE and market to book ratio).

In summary, the event study and OLS regressions confirm that the divergence in stock price behavior surrounding the event time $t=0$ between the treatment and control group is mainly statistically significantly different. This makes it more reliable to infer that the treatment groups' negative stock price reactions are mainly caused by addition to the indicative list and not or less by another unrelated (market) event. Moreover, the results suggest that firms which are not grandfathered and do not meet the hurdle rate, and hence immediately subject to the hurdle rate criterium, experienced the highest negative abnormal price reactions. Therefore, this suggests that the investment community perceives the fact that these stocks will not get added to one of FTSE Russell's indices in the short-term as negative news. However, this finding is rather suggestive than really convincing as the average abnormal returns for these stocks are not statistically significant on every considered test statistic. Finally, considering firm-specific characteristics, it seems that a (potential) index exclusion is more adversely priced by investors of 'growth', low profitable/loss-making and small market capitalization stocks.

Table 9 Multivariate OLS regression results - Event date category 2

Dependent variable	CAR[0,1]									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Publ. Vat. Cat. 1 [0-5%]	-2.06* (1.23)	-2.76** (1.26)	0.81 (1.16)	0.11 (1.19)	-7.12 (4.90)	-2.97** (1.51)	-3.21 (2.18)	0.65 (1.39)	-1.06 (2.72)	-1.38 (2.94)
Publ. Vat. Cat. 2-5 (5-25%)	-1.48*** (0.48)	-2.07*** (0.52)	-1.46*** (0.50)	-2.04*** (0.53)	-2.50*** (0.80)	-2.32*** (0.63)	-2.52** (0.99)	-2.51*** (0.51)	-1.03** (0.53)	-2.52*** (0.78)
Publ. Vat. Cat. 6 (>25%) (Control)	0.17*** (0.05)	-0.45** (0.21)	0.17*** (0.05)	-0.45** (0.21)	0.01 (0.23)	-0.32 (0.22)	-0.14 (0.22)	-0.34 (0.22)	-0.72*** (0.21)	-0.12 (0.22)
Interactions										
Cat. 1 x Non-Constituent			-3.88** (1.94)	-3.88** (1.96)	3.04 (3.05)	-1.34 (1.12)	-1.87 (1.57)	-3.17 (2.08)	-3.50* (1.89)	-2.73 (2.15)
Cat. 2-5 x Non-Constituent			-0.34 (1.58)	-0.60 (1.73)	-0.08 (1.71)	-0.31 (1.76)	-0.05 (1.90)	-0.38 (1.60)	-1.31 (1.71)	-0.25 (1.81)
Cat. 1 x Market Value (> median)					2.12 (1.95)	3.58** (1.45)				
Cat. 2-5 x Market Value (> median)					1.83* (1.00)	1.35 (0.97)				
Cat. 6 x Market Value (> median)					-0.15 (0.11)	-0.24** (0.11)				
Cat. 1 x ROE (> median)					4.00 (2.53)		3.90* (2.21)			
Cat. 2-5 x ROE (> median)					0.79 (0.97)		0.98 (1.06)			
Cat. 6 x ROE (> median)					-0.54*** (0.10)		-0.50*** (0.10)			
Cat. 1 x Leverage ratio (> median)					-3.49 (2.38)			-1.90 (2.57)		
Cat. 2-5 x Leverage ratio (> median)					1.34 (0.96)			1.09 (1.05)		
Cat. 6 x Leverage ratio (> median)					-0.22** (0.10)			-0.18* (0.10)		
Cat. 1 x Market to Book (> median)					0.57 (2.66)				1.29 (2.90)	
Cat. 2-5 x Market to Book (> median)					-2.38** (1.02)				-1.99** (0.97)	
Cat. 6 x Market to Book (> median)					0.72*** (0.13)				0.51*** (0.12)	
Cat. 1 x Listing Age (> median)					2.44 (3.06)					1.48 (2.69)
Cat. 2-5 x Listing Age (> median)					0.90 (0.75)					1.30 (0.88)
Cat. 6 x Listing Age (> median)					-0.53*** (0.10)					-0.62*** (0.10)
Industry (ICB) Fixed Effects	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
- Base level: Basic Materials										
F-statistic	7.23***	25.10***	4.73***	21.36***	14.15***	17.96***	18.21***	18.22***	20.76***	19.10***
Prob > F	0.0001	0	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R ²	0.02	0.08	0.02	0.08	0.12	0.09	0.09	0.08	0.09	0.09
Adjusted R ²	0.02	0.07	0.02	0.08	0.12	0.08	0.09	0.08	0.09	0.09
Total N Observations	2,764	2,764	2,764	2,764	2,764	2,764	2,764	2,764	2,764	2,764
- N Category 1	27	27	27	27	27	27	27	27	27	27
(N const. = 7, N non-const. = 20)										
- N Category 2-5	128	128	128	128	128	128	128	128	128	128
- N Category 6	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609	2,609

Note: For all regressions as dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Three indicator variables are included that take the value of 1 when a firm belongs to that particular Public Voting Power category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%) public voting right) are aggregated into one dummy variable. Besides that in regressions (2) and (4)-(10) Industry Classification Benchmark dummies are included that control for industry-fixed effects. Additionally, in regressions (3)-(10) interactive dummies are included between category 1 and being a non-constituent and category 2-5 and being a non-constituent at the time of addition to the indicative list. This interaction is not present for the control sample as they are all index constituents. Furthermore, in regression (5) the firm-specific control variables are included as interactive dummies with the Public Voting Power categories. Within this interaction, the variables Market Value, ROE, Leverage ratio, Market To Book and Listing Age take the value of 1 when the firm has a value that is above the sample median. In regressions (6)-(10) these interactive variables are included separately. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity (see appendix). *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

6. Conclusion

This research paper applied the short-term event study methodology and cross-sectional regression analysis of cumulative abnormal returns in order to form a conclusion regarding the proposed research question: ‘*How does FTSE Russell’s public voting right hurdle rate decision affect shareholder value of (potentially) excluded US firms?*’.

Overall, this paper finds indicative results suggesting that the market on average penalized US-listed firms that are or will potentially be excluded from one of FTSE Russell’s indices due to a low public voting right percentage. More concrete, firms that are or will potentially be excluded on average experienced a statistically significant negative cumulative abnormal return of -1.58% (event window [0,1]) surrounding the event time at which these firms are added to the indicative list of affected securities. Despite that, the majority of these firms is grandfathered for 5 years and have more than 5% public voting rights, and is therefore not excluded in the short-term based on public voting rights. As FTSE Russell annually reviews the magnitude of the hurdle rate between 5 and 25%, it seems that the potential threat of index exclusion due to an increase in this hurdle rate is also adversely priced by investors. Looking more specifically, the results suggest that firms which do not meet the 5% hurdle rate and are not grandfathered, experienced the most negative statistically significant abnormal returns, up to -3.07% in the event window [0,1]. In other words, the market seems to have penalized these low voting right firms for the fact that they will not get included in one of FTSE Russell’s indices in the short-term in case they refuse to increase their public voting percentage. However, it needs to be emphasized that this result is rather suggestive than completely convincing as these abnormal returns are not statistically significant on every test statistic.

Furthermore, cross-sectional regression analysis reveals that ‘growth’ stocks’ shareholder value, which stocks have a high market to book ratio, seems to be more adversely affected by a potential index exclusion than ‘value’ stocks. In addition, younger firms’ stocks, in terms of time since the IPO, also seem to be more adversely affected by a potential index exclusion than firms that are publicly listed for a longer period of time. Next to that, size in terms of market capitalization also seems to matter with respect to the abnormal returns. Small market capitalization firms experienced on average higher negative abnormal returns than bigger market capitalization firms. Finally, low profitable and loss-making stocks experienced more negative abnormal returns than high profitable stocks. Overall, the results indicate that a potential index exclusion is of more importance for a small, young publicly-listed firm with high growth potential than for a big, mature firm with less growth potential.

Research limitations

Abovementioned conclusions are mainly based on the second event date category, which entails firms that are added to the indicative list after the initial announcement. The initial announcement event study results, however, seem to be less convincing as the average abnormal returns are not statistically significant mainly due to potential cross-sectional dependence of abnormal returns. Besides that, the firms that got added to the indicative list experienced less negative abnormal returns than for the second event date category. Making inferences is also hard as the treatment sample might be influenced by the wrong allocation to this sample. There might be firms included in the treatment sample of the initial announcement that were not yet added to the indicative list at the initial announcement. This could, therefore, indicate biased event study results for the initial announcement.

Contribution and future research

Based on this research it seems that the investment community on average perceives a (potential) FTSE Russell's index exclusion as negative news, resulting in statistically significant negative abnormal returns. This paper's findings are not in line with the S&P1500 dual-class restriction rule findings by Winden and Baker (2018), who concluded that the market did not penalize firms based on their prospective S&P index exclusion as they failed to find any statistically significant negative abnormal returns. Therefore, this research extends the novel literature strand of the corporate governance role and influence of index providers with regard to public voting rights, by examining a different leading index provider than S&P and documenting that the investment community perceives a (potential) FTSE Russell index exclusion as negative news, what might incentivize firms to increase their public voting rights. Therefore, although Winden and Baker conclude that they do not expect that index providers will materially influence firms' decision on issuing unequal voting right shares, this research shows that it might be too premature to conclude this. Besides that, beyond Winden and Baker's paper, this research contributes to the literature in that it documents what type of firms are financially more adversely affected by a (potential) index exclusion.

Although the market seems to respond negatively to a potential FTSE Russell index exclusion, the question remains whether founders and/or insiders of firms conclude that the benefits of index inclusion outweigh the control benefits of unequal voting right structures. Therefore, it is important that future research will investigate whether index providers do incentivize firms to increase their public voting rights and/or discourage private firms to list with unequal voting right shares. For instance, this could be examined by considering the change in public voting rights or change in share structure (e.g. unification of dual-class shares) of firms after being excluded from a particular index due to not meeting an eligibility criterium related to their voting right structure.

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Exhibit 1 Variable description

Table 10 Variable description

Number	Variable	Unit of observation	Description
1	Daily Return	Percentage	Represents the daily logarithmic return of each observation within the sample. This return is based on the daily Adjusted Closing Price of the corresponding stock.
2	Market Return	Percentage	Market return represents the daily logarithmic return of the S&P1500 composite index.
3	Market Value (MV)	Million USD	Indicates for each firm the market value at time t which is computed by multiplying the share price by the number of ordinary shares in issue.
4	Membership	Dummies	Membership indicates in which index a particular company is included or could potentially be included at the time of the event.
5	Constituent	Dummy	Constituent is a dummy variable indicating whether a firm is or is not an index constituent at the time of addition to the indicative list of affected securities.
6	Public Voting Power	Percentage	This variable gives a company's percentage voting rights in the hands of unrestricted (free-float) shareholders at the event time, which ranges between 0 and 25%.
7	Public Voting Power Category	Dummies	Derived from Public Voting Power variable which divides a firm's percentage voting rights in the hands of unrestricted (free-float) shareholders at the event time into 6 categories: 1=[0-5%], 2=(5-10%], 3=(10-15%], 4=(15-20%], 5=(20-25%], 6=(25-100%].
8	Industry Classification Benchmark (ICB)	Dummies	Indicates a firm's industry classification according to FTSE which divides firms into 10 industry categories: Basic Materials, Consumer Goods, Consumer Services, Financials, Healthcare, Industrials, Oil & Gas, Technology, Telecommunications and Utilities.
9	Return On Equity (ROE)	Percentage	Return On Equity (ROE) is based on the fiscal year prior to the event date and is calculated as follows: $(\text{Net Income} - \text{Preferred Dividend Requirement}) / \text{Average of beginning and end of fiscal year common equity} * 100$.
10	Leverage	Percentage	Represents the leverage ratio of a specific firm in the fiscal year prior to the event date and is calculated as follows: $(\text{Short Term Debt} + \text{Current Portion of Long Term Debt}) / \text{Total Assets} * 100$.
11	Market To Book	Ratio	Indicates the Market to Book Value which is based on the fiscal year prior to the event date and is computed as following: $\text{Stock close price at end of fiscal year} / \text{Book value per share at end of fiscal year}$.
12	Listing Age	Years	Listing Age represents the number of years between a firm's event date and a firm's Initial Public Offering (IPO).

Note: This table gives for each variable used in this research its name, unit of observation and description.

Exhibit 2 Additional sample properties

Table 11 Sample distribution: Index Membership against Public Voting Power categories

		Public Voting Power Category						Total N	Percentage	
Treatment	Index Series	Membership	1	2	3	4	5	6		
Treatment	FTSE Russell US Index Series	R1000	6	7	7	5	8	NA	33	12%
		R2000	14	17	17	25	24	NA	97	34%
		Russell Microcap	1	5	4	8	8	NA	26	9%
		Non-constituent (R3000)	2	0	0	0	0	NA	2	1%
	FTSE Global Equity Index Series (GEIS)	Micro (GEIS)	0	12	11	23	17	NA	63	22%
		Small (GEIS)	5	4	4	4	12	NA	29	10%
		Mid (GEIS)	0	2	1	1	0	NA	4	1%
		Large (GEIS)	0	0	2	0	1	NA	3	1%
		Non-constituent (GEIS)	18	2	0	2	4	NA	26	9%
Control	FTSE Russell US Index series	R1000 (Control)	0	0	0	0	0	1,760	1,760	34%
		R2000 (Control)	0	0	0	0	0	3,349	3,349	66%
		Total N	46	49	46	68	74	5,109	5,392	
		Percentage	16%	17%	16%	24%	26%	100%		

Note: The percentages are calculated separately for the treatment and control group. For instance, the treatment sample consists of 34% R2000 index companies. And of the treatment sample 16% is included in public voting category 1, which entails a public voting rights percentage of 5% or lower.

Table 12 Sample distribution: Industry Classification Benchmark (ICB) against Public Voting Power categories

ICB	Public Voting Power Category						Total	Control	Treatment
	1	2	3	4	5	6			
Basic Materials	0	0	4	4	0	196	4%	4%	3%
Consumer Goods	2	8	6	7	16	407	8%	8%	14%
Consumer Services	10	16	11	23	18	567	12%	11%	28%
Financials	18	10	9	8	15	1,310	25%	26%	21%
Health Care	1	2	4	4	7	737	14%	14%	6%
Industrials	2	6	8	9	6	938	18%	18%	11%
Oil & Gas	0	2	0	6	6	249	5%	5%	5%
Technology	8	5	4	4	5	523	10%	10%	9%
Telecommunications	2	0	0	1	0	41	1%	1%	1%
Utilities	3	0	0	2	1	141	3%	3%	2%
Total	46	49	46	68	74	5,109	5,392	5,109	283

Note: The table above presents the number of firms in a particular Public Voting Power category against its Industry Classification Benchmark (ICB). For example, 11% of the treatment sample and 18% of the control sample is defined as an Industrial firm according to the Industry Classification Benchmark (ICB). To illustrate more, of the 46 sample firms in category 1 ([0-5%] public voting right), 8 firms are defined as a technology company by the ICB.

Exhibit 3 Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

Initial announcement – Event date category 1

Regression (1)	Regression (2)	Regression (3)
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]
chi2(1) = 0.51 Prob > chi2 = 0.4766	chi2(1) = 41.10 Prob > chi2 = 0.0000	chi2(1) = 107.47 Prob > chi2 = 0.0000
Regression (4)	Regression (5)	Regression (6)
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]
chi2(1) = 95.18 Prob > chi2 = 0.0000	chi2(1) = 61.39 Prob > chi2 = 0.0000	chi2(1) = 42.20 Prob > chi2 = 0.0000
Regression (7)	Regression (8)	
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	
chi2(1) = 49.55 Prob > chi2 = 0.0000	chi2(1) = 49.37 Prob > chi2 = 0.0000	

Note: These tables give the Breusch-Pagan/Cook-Weisberg heteroskedasticity test results for the regressions of the first event date category.

Addition after initial announcement – Event date category 2

Regression (1)	Regression (2)	Regression (3)
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]
chi2(1) = 538.66 Prob > chi2 = 0.0000	chi2(1) = 0.61 Prob > chi2 = 0.4330	chi2(1) = 550.47 Prob > chi2 = 0.0000
Regression (4)	Regression (5)	Regression (6)
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]
chi2(1) = 0.11 Prob > chi2 = 0.7405	chi2(1) = 4.23 Prob > chi2 = 0.0398	chi2(1) = 0.89 Prob > chi2 = 0.3449
Regression (7)	Regression (8)	Regression (9)
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]
chi2(1) = 2.46 Prob > chi2 = 0.1170	chi2(1) = 3.85 Prob > chi2 = 0.0499	chi2(1) = 20.28 Prob > chi2 = 0.0000
Regression (10)		
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: fitted values of CAR[0,1]		
chi2(1) = 0.36 Prob > chi2 = 0.5484		

Note: These tables give the Breusch-Pagan/Cook-Weisberg heteroskedasticity test results for the regressions of the second event date category.

Exhibit 4 Robustness check subsamples

Table 13 Multivariate OLS regression on subsample Listing age above/below median - Event date category 1

Dependent variable	CAR[0,1]			
	Listing age > median		Listing age < median	
Subsample	(1)	(2)	(1)	(2)
Publ. Vot. Cat. 1 [0-5%]	-0.72	(0.92)	-0.87	(0.86)
Publ. Vot. Cat. 2-5 (5-25%)	-0.52	(0.58)	-1.59**	(0.73)
Publ. Vot. Cat. 6 (>25%) (Control group)	-0.94**	(0.46)	-0.19	(0.51)
Industry (ICB) Fixed Effects	Yes		Yes	
- Base level: Basic Materials				
F-statistic	5.96***		6.88***	
Prob > F	0.0000		0.0000	
R ²	0.06		0.08	
Adjusted R ²	0.05		0.07	
Total N Observations	1,308		1,320	
- N Category 1	7		12	
- N Category 2-5	43		66	
- N Category 6	1,258		1,242	

Note: As dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Regression (1) is executed on the subsample of firms that have a Listing age that is above the median sample value, whereas regression (2) is executed on the subsample of firms that have a Listing age that is below the median sample value. Three indicator variables are included that take the value of 1 when a firm belongs to that particular category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ([5-25%] public voting right) are aggregated into one dummy variable. Besides that, all regressions include the ICB dummies which control for industry-fixed effects. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Table 14 Multivariate OLS regression on subsample Market Value above/below median - Event date category 1

Dependent variable	CAR[0,1]			
	MV > median		MV < median	
Subsample	(1)		(2)	
Independent variables	(1)		(2)	
Publ. Vot. Cat. 1 [0-5%]	-0.35	(1.26)	-1.20	(0.81)
Publ. Vot. Cat. 2-5 (5-25%)	-0.55	(0.55)	-1.54**	(0.75)
Publ. Vot. Cat. 6 (>25%) (Control group)	-0.51	(0.42)	-0.76	(0.57)
Industry (ICB) Fixed Effects	Yes		Yes	
- Base level: Basic Materials				
F-statistic	6.00***		8.13***	
Prob > F	0.0000		0.0000	
R ²	0.07		0.07	
Adjusted R ²	0.06		0.06	
Total N Observations	1,314		1,314	
- N Category 1	5		14	
- N Category 2-5	31		78	
- N Category 6	1,278		1,222	

Note: As dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Regression (1) is executed on the subsample of firms that have a Market Value (MV) that is above the median sample value, whereas regression (2) is executed on the subsample of firms that have a Market Value that is below the median sample value. Three indicator variables are included that take the value of 1 when a firm belongs to that particular category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%) public voting right) are aggregated into one dummy variable. Besides that, all regressions include the ICB dummies which control for industry-fixed effects. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Table 15 Multivariate OLS regression on subsample Market Value above/below median - Event date category 2

Dependent variable	CAR[0,1]	
	MV > median	MV < median
Subsample	(1)	(2)
Independent variables		
Publ. Vot. Cat. 1 [0-5%]	0.60 (1.26)	-2.78*** (1.01)
Publ. Vot. Cat. 2-5 (5-25%)	-1.15 (0.76)	-2.19*** (0.70)
Publ. Vot. Cat. 6 (>25%) (Control group)	-0.65*** (0.17)	-0.21 (0.40)
Interactions		
Cat. 1 x Non-Constituent	-1.17 (1.29)	-1.41 (1.92)
Cat. 2-5 x Non-Constituent		-0.25 (1.77)
Industry (ICB) Fixed Effects	Yes	Yes
- Base level: Basic Materials		
F-statistic	19.61***	9.38***
Prob > F	0.0000	0.0000
R ²	0.10	0.09
Adjusted R ²	0.09	0.08
Total N Observations	1,382	1,382
- N Category 1	9	18
- N Category 2-5	25	103
- N Category 6	1,348	1,261

Note: As dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Regression (1) is executed on the subsample of firms that have a Market Value (MV) that is above the median sample value, whereas regression (2) is executed on the subsample of firms that have a Market Value that is below the median sample value. Three indicator variables are included that take the value of 1 when a firm belongs to that particular category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%] public voting right) are aggregated into one dummy variable. Additionally, interactive dummies are included between category 1 and being a non-constituent and category 2-5 and being a non-constituent at the time of addition to the indicative list. This interaction is not present for the control sample as they are all index constituents. Furthermore, this interaction is not present for category 2-5 in regression (1) as there are no non-constituents within this subsample. Besides that, all regressions include the ICB dummies which control for industry-fixed effects. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Table 16 Multivariate OLS regression on subsample Return On Equity above/below median - Event date category 2

Dependent variable	CAR[0,1]			
	ROE > median		ROE < median	
Subsample	(1)		(2)	
Independent variables	(1)		(2)	
Publ. Vot. Cat. 1 [0-5%]	0.48	(1.33)	-3.01	(1.88)
Publ. Vot. Cat. 2-5 (5-25%)	-1.48***	(0.49)	-2.74***	(1.01)
Publ. Vot. Cat. 6 (>25%) (Control group)	-0.57**	(0.26)	-0.27	(0.33)
Interactions				
Cat. 1 x Non-Constituent	-1.35	(1.84)	-2.44	(2.90)
Cat. 2-5 x Non-Constituent			0.04	(1.92)
Industry (ICB) Fixed Effects	Yes		Yes	
- Base level: Basic Materials				
F-statistic	10.99***		12.06***	
Prob > F	0.0000		0.0000	
R ²	0.07		0.11	
Adjusted R ²	0.06		0.10	
Total N Observations	1,382		1,382	
- N Category 1	13		14	
- N Category 2-5	64		64	
- N Category 6	1,305		1,304	

Note: As dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Regression (1) is executed on the subsample of firms that have a Return On Equity (ROE) that is above the median sample value, whereas regression (2) is executed on the subsample of firms that have a Return On Equity that is below the median sample value. Three indicator variables are included that take the value of 1 when a firm belongs to that particular category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%) public voting right) are aggregated into one dummy variable. Additionally, interactive dummies are included between category 1 and being a non-constituent and category 2-5 and being a non-constituent at the time of addition to the indicative list. This interaction is not present for the control sample as they are all index constituents. Furthermore, this interaction is not present for category 2-5 in regression (1) as there are no non-constituents within this subsample. Besides that, all regressions include the ICB dummies which control for industry-fixed effects. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.

Table 17 Multivariate OLS regression on subsample Market To Book ratio above/below median - Event date category 2

Dependent variable	CAR[0,1]			
	MTB > median		MTB < median	
Subsample				
Independent variables	(1)		(2)	
Publ. Vot. Cat. 1 [0-5%]	0.49	(1.15)	-3.52	(2.62)
Publ. Vot. Cat. 2-5 (5-25%]	-3.15***	(0.87)	-0.95	(0.57)
Publ. Vot. Cat. 6 (>25%) (Control group)	-0.23	(0.29)	-0.71**	(0.28)
Interactions				
Cat. 1 x Non-Constituent	-3.70*	(2.08)	-1.05	(3.89)
Cat. 2-5 x Non-Constituent	0.09	(0.78)	-1.49	(1.93)
Industry (ICB) Fixed Effects	Yes		Yes	
- Base level: Basic Materials				
F-statistic	14.60***		7.90***	
Prob > F	0.0000		0.0000	
R ²	0.13		0.07	
Adjusted R ²	0.12		0.07	
Total N Observations	1,382		1,382	
- N Category 1	18		9	
- N Category 2-5	63		65	
- N Category 6	1,301		1,308	

Note: As dependent variable is used the CAR in the event window [0,1]. The constant is excluded in all regressions. Regression (1) is executed on the subsample of firms that have a Market To Book (MTB) ratio that is above the median sample value, whereas regression (2) is executed on the subsample of firms that have a Market To Book ratio that is below the median sample value. Three indicator variables are included that take the value of 1 when a firm belongs to that particular category. Category 1 ([0-5%] public voting right) and category 6 (>25% public voting right) (Control group) are included individually, whereas groups 2-5 ((5-25%] public voting right) are aggregated into one dummy variable. Additionally, interactive dummies are included between category 1 and being a non-constituent and category 2-5 and being a non-constituent at the time of addition to the indicative list. This interaction is not present for the control sample as they are all index constituents. Besides that, all regressions include the ICB dummies which control for industry-fixed effects. Finally, reported between brackets are the robust standard errors as there is evidence of heteroscedasticity. *, ** and *** denote statistical significance at respectively the 10%, 5% and 1% confidence interval.