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The effect of passive investors and passive blockholders on managerial entrenchment

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Abstract

Passive investment is becoming increasingly more popular, but literature on this topic remains minimal. Using an exogenous shock in passive ownership caused by Russell index assignments, this paper aims to establish the effect of both passive investors and passive blockholders on managerial entrenchment. As managerial entrenchment is difficult to formulize in a testable manner, it is tested using CEO tenure, CEO Pay Slice (CPS) and forced CEO turnover. Two-stage IV regression estimates indicated that passive ownership significantly increased managerial entrenchment, whilst passive blockholders with an ownership threshold of 5% significantly decreased managerial entrenchment. Several robustness checks illustrated the strength of the findings. Nonetheless, this paper should be seen as a foundation to better understand the impact of passive blockholders. As this is a relatively new topic of interest, the methodology best suited for this type of investor remains uncertain. This paper has found signs that the methodology used for passive investors can also be used for passive blockholders, but further research should determine whether this is genuinely the case.

Keywords: **Passive ownership, passive blockholder, Russell index assignments, managerial entrenchment, corporate governance**

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1 Introduction

Passive index funds have been steadily gaining momentum throughout the decades that followed since their introduction in 1971. Current predictions indicate that passive investments could overtake active investment within the next decade (Bloomberg Intelligence, 2021). Literature seems to fall behind on the magnitude of this type of investment. This lack of research causes two problems to surface, which are the presence of grey areas and the contradicting results that were found on the effects of both passive investors and passive blockholders on corporate governance. The latter is mostly due to uncertainty within the methodology about what analysis fits this type of data best.

This paper attempts to tackle both issues but puts more emphasis on the former. Using exogenous shocks in passive institutional ownership caused by Russell index assignments, this study attempts to analyze whether passive ownership and passive blockholders significantly affect managerial entrenchment. The research question of this paper is as follows:

What is the effect of passive investors and passive blockholders on managerial entrenchment?

Whilst the effect of passive ownership on managerial entrenchment has been tested previously, opposing views on this topic remain. This effect will be analyzed first, as this allows us to compare both the methodology and the subsequent results with previous papers and to verify the use of the methodology that will also be used for passive blockholders. The data consists of 3000 US firms per year from 1998 through 2018 that are predicted to be in the Russell 2000 and the Russell 1000. The two-stage fuzzy discontinuity estimates reported that passive institutional ownership increased by 1.47% to 3.48% if a firm is assigned to the Russell 2000 instead of the Russell 1000. This exogenous shock in passive ownership is then used to determine the effects on managerial entrenchment.

Managerial entrenchment is formulated using three determinants that did not show any contradicting results in previous corporate governance papers; CEO tenure, the CEO Pay Slice (CPS) and forced CEO turnover. Entrenched CEOs generally have higher tenure (Berger et al., 1997; Ellili, 2012; Meo et al., 2017; Salehi et al., 2018; Ehikioya et al., 2021), obtain both larger payout structures and larger pay slices (Hu and Kumar, 2009; Heath et al., 2022), and experience lower levels of turnover-performance sensitivity (Berger et al., 1997; Antounian et al., 2021). The effect of passive ownership on managerial entrenchment was examined using a two-stage instrumental variable approach on each of these three determinants. The results of this IV analysis indicated that passive institutional ownership has no significant effect on CEO tenure. However, significant effects were found for both CPS and forced CEO turnover. For each percent of increase in passive institutional ownership, CPS increased by 6.37 to 6.42 percent. On the other hand, the probability of CEO forced turnover decreased by 12.62 to 15.23

percent. These results indicate that passive ownership increases the level of managerial entrenchment. The findings are robust to either firm or industry fixed effects, and they are robust to using a higher bandwidth that contains a stronger instrument.

Subsequently, the effect of passive blockholders on managerial entrenchment was tested and this closely followed the methodology that was used in the analysis on passive ownership. Three different ownership thresholds (1%, 3% and 5%) were used to establish whether an investor is a blockholder. Assigning a firm to the Russell 2000 instead of the Russell 1000 resulted in an increase of 1% passive blockholder ownership by 0.71 to 1.50 percent points, an insignificant change in 3% passive blockholder ownership and a decrease in 5% passive blockholder ownership by 0.30 to 0.48 percent points.

The estimates of the two-stage IV regression indicated that passive blockholder with at least 1% ownership increased managerial entrenchment, as a one percent point increase of such ownership corresponds to an increase in CEO tenure of 1.93 years, a 4.38 to 4.48 percent point increase in CPS and a 9.31 to 10.92 percent point decrease in forced CEO turnover probability. On the other hand, a one percent point increase in 5% passive blockholder ownership corresponds to an economically insignificant decrease in CEO tenure, a 29.51 to 30.14 percent point decrease in CPS and a 64.43 to 73.55 percent point increase in forced CEO turnover. These estimates indicate that 5% passive blockholder ownership lower the level of managerial entrenchment. The possible contamination of low-level observation years was tested in a robustness check. This indicated that the findings of 1% passive blockholder ownership were not robust, whilst the results of 5% passive blockholder ownership remained significant.

These results support the theory that passive investors increase managerial entrenchment, whilst passive blockholders lower the level of managerial entrenchment and thus promote corporate governance. As passive blockholders are becoming more prominent in the financial landscape, it is important to understand their impact on firm characteristics. For example, the reported effects of passive blockholders support the theory of Appel et al. (2016a). They state that index funds, which are the majority of passive blockholders, govern only through voting behavior using low-cost principles that are generally applicable.

The findings in this paper can be seen as a bridge between several conclusions of previous papers that found opposing views on the effect of passive mutual funds and exchange-traded funds (ETFs). There have been several researchers who stated that passive ownership would be harmful to corporate governance (Bebchuk et al., 2017; Bebchuk & Hirst, 2019; Heath et al., 2022; Qin & Wang, 2018, Schmidt & Fahlenbrach, 2017). Their results are founded in an incentive-based theoretical model, as

passive investors contain little (financial) incentives to actively combat myopic stewardship behavior and improve corporate governance on a firm-specific level. Empirical results for this theoretical model have been found, as passive ownership seems to increase managerial entrenchment. On the other hand, other authors have concluded that there is a shift in incentives noticeable in index funds. This is caused by increases in both their scope and scale, and they conclude that corporate governance improves as these two aspects of index funds increase (Appel et al., 2016b; Barzuza et al., 2019; Fu et al., 2021; Kahan & Rock, 2020). This change in incentives is supported by the empirical findings of this paper, as passive blockholders appear to lower managerial entrenchment.

Nonetheless, further research is required in order to establish the true effect of passive blockholders on corporate governance. The results from this paper illustrate that the size of the blockholder alters the effect, but previous papers have also illustrated that this effect can change further based on the dimension of governance (Barzuza et al., 2019) and the allocation of wealth to these passive blockholders (Corum et al., 2021). Future research should investigate the interdimensional effect of these three aspects, as this is necessary to estimate the true effect of the rising popularity of passive investment.

The next section reports the theoretical frameworks used for this paper, which follows a top-down approach. It starts very broad, as it showcases the historical foundation that has caused the recent rise in popularity of passive investors. Then the theory will narrow down in the specific contents of each type of investor. In every main section, the first part will revolve around passive investors, whilst the second part includes passive blockholders. After the theoretical framework, the data collection is explained along with the summary statistics. The next section explains the methodology used in the paper, which is based on different Russell index assignments. The theory behind the Russell indices is introduced in the first part of the Methodology. The subsequent section reports all results, along with several robustness checks. This is followed by a conclusion on the hypotheses and the corresponding research question. The conclusions section also contains advice on future research. The appendices and reference list can be found at the end of the paper.

2 Theoretical frameworks

2.1 Separation of ownership and control

The agency theory of corporate governance explains the issues that arise in the contracting of managers (Alchian and Demsetz, 1975; Jensen and Meckling, 1976). A corporation can be regarded as a large set of contracting relationships between individuals, in which contracts are negotiated repeatedly for each individual to maximize their own profit (Learmount, 2004). Agency theory explains

the behavior of these individuals from the perspective of the designed contracts. Shareholders are hereby denoted as risk takers of the firm, who direct their funds to the manager that they believe will obtain the best results with the shareholders' investments. These managers are denoted as the owners of the firm, or at least of the firms' operations. The separation of ownership and control in firms show the necessity for contractual obligations. Contracts between these parties determine both the payout structure and the minimal requirements necessary for these payouts to be realized. The latter is done as it is difficult to implement contracts with operation requirements that are based on long-term forecasts. Therefore, only minimal requirements need to be met for these contracts to be valid.

The principal-agency problem explains the problems that arise with the implied freedom of these managerial contracts (Fama and Jensen, 1983). In this case, shareholders are the principals and managers are the agents and these entities contain different preferences and opposing views towards risk exposure. Shareholders wish to maximize firm value and thus contract a manager to obtain this result. However, managers wish to maximize their own utility, which could be based on value-destroying behavior that mostly benefits the agent. The payout structure of the agents' contracts is used to align the interests of the agents to that of the principals (Garen, 1994).

Agents are generally more exposed to internal information than the principals and this disparity combined with the differences in preferences implies that monitorization of the agents is required. The level of information asymmetry between these parties indicates that principals will experience more difficulty and higher costs when monitoring these agents as they must monitor information that the agent might possess, but which the principals cannot access. As principals in this case generally do not cooperate, one individual principal must be incentivized enough to monitor the manager. Thus, the degree of information asymmetry and the stake of each principal determines the level of managerial monitorization.

2.2 Institutional blockholders

An institutional investor is a firm or organization that invests on behalf of other market participants. Throughout the last decades, the proportion of institutional ownership has been steadily increasing. In 2019, the global top 500 asset managers passed 100 trillion dollars in assets (Thinking Ahead Institute, 2020). As these institutions can hold relatively large percentages (blocks) of a firm, these types of investors are sometimes referred to as institutional blockholders. Institutional blockholders can be active, passive or quasi (a mixture of both). The true definition of blockholders remains ambiguous, as no theoretical foundation has been determined in this field of study. A considerable number of researchers use 5% ownership as a threshold to determine blockholders. This is based on

the SEC 13D-1 ruling, which requires any investor whose ownership surpasses the 5% threshold to disclose their holdings. Any theoretical explanation for the use of this threshold remains unknown. Edmans and Holderness (2017) even call upon future research to also study blocks below 5%. Two problems do however arise with their request, as these blockholders should be large enough to exert influence on the company with their voting rights and their stake should be substantial enough to incentivize the blockholder to not trade on transient firm news as they are also more likely to monitor firm-level decisions (Chung et al., 2019a).

Changes within the financial landscape, such as internet brokerage, has made the financial market more accessible to retail investors, which in turn resulted in more diffuse ownership (Weinhardt et al., 2000; Barber & Odean, 2001a; Evans, 2009; Backus et al., 2021; Farrell et al., 2022). If a firm contains mostly small individual owners, it could imply that the information asymmetry between the shareholders and management is not being optimally punished and/or correctly monitored as no individual shareholder would want to yield the costs of these actions. Institutional blockholders alleviate the incentive problems that small retail investors face when monitoring managers (Black, 1990). Consequently, this should imply that a blockholder could create more value than a similar block containing numerous individual investors. Konijn et al. (2011) found a negative correlation between Tobin's Q and blockholder dispersion, which implies that a set of dispersed small blockholders is less beneficial than a single large blockholder. However, other studies on US firms have found no significant effect of blockholders on firm performance (Loderer & Martin, 1997; Himmelberg et al., 1999; Demsetz & Villalonga, 2001).

Theoretical models on the effect of blockholders on corporate governance indicated two-sided outcomes (Edmans and Holderness, 2017). Corporate governance could worsen as blockholders use their significant share to extract private benefits or to pursue objectives other than firm value maximization. On the other hand, blockholders could increase corporate governance as their substantial level of ownership allows them to be able to exert governance through direct intervention, 'voice', and indirect mechanisms, 'exit'.

Holderness and Sheehan (1988) concluded that several types of majority-owned firms have a higher likelihood of being acquired than their paired, diffusely held firms. They also found that firms with individual majority shareholders tend to have lower leverage levels than similar-size firms with diffuse ownership. Helling et al. (2019) find that blockholders positively influence innovation levels and mitigate managerial myopia through the 'exit' model of governance. Glossner (2019) concludes that long-term blockholders moderate business operations to ensure correct implementation and resource allocation with regards to the CSR strategy.

2.3 Passive ownership

There have been several studies on the negative effects of excessive trading. Barber and Odean (2000, 2001b) stated that excessive trading has negative effects on returns. Cohn-Urbach and Westerholm (2006) concluded that the most active traders earn the least gross returns relative to their more conservative peers, whilst considering both retail and institutional investors. Daniel and Hirschleifer (2015) studied excessive trading in the asset market, and they found that excessive trading from both individuals and assets managers resulted in higher risk levels and lower net returns. The increased attention towards both these findings and psychological biases in the financial sector has given rise to the desire of less-biased investment strategies.

Passive investing is designed to maximize returns by minimizing trading activity. This strategy is used to avoid the fees and subpar performance that might occur with high frequency trading. Passive investors generally have a buy-and-hold portfolio with long-term investment horizons. They trade on the beliefs that it is difficult to correctly time the market on a long-term basis, which implies that one would yield higher long-term returns simply by matching market performance.

Literature on passive ownership has primarily used the Russell 1000 and Russell 2000 indices as a determinant of passive institutional ownership as these are market capitalization-weighted indices. Although the S&P 500 index is also largely popular, this index is determined by an independent board, which could result in selection bias. If this is the case, then the firms close to the threshold of the index might not share close resemblance to the firms that fall just outside the index and can therefore not be matched to one another.

Currently, there is no clear consensus on the effect of Russell index assignment on the total ownership structure. Appel et al. (2016a) and Glossner (2019) state that index allocation has no effect on total institutional ownership. However, they both found that the proportion of passive ownership did increase for the Russell 2000 compared to the Russell 1000. Their findings contradict that of both Boone and White (2015) and Crane et al. (2016). They concluded that total institutional ownership increases after a Russell 2000 index assignment and that this increase is found in both the active and passive compartment of institutional ownership. The estimates on the increase of total institutional ownership are between 10 to 40 percentage points.

Appel et al. (2020) state that the Russell 2000 index is more popular for index funds and exchange-traded funds than the Russell 1000 index. In a previous paper, Appel et al. (2016a) concluded that the proportion of a stock's total market capitalization held by passive institutional investors is around 40%

higher for stocks in the top of the Russell 2000 index than for stocks in the bottom of the Russell 1000 index. In order to examine the effect of passive investors on both managerial and shareholder decision-making, the existence of this type of investment within index firms must be determined first. In particular, the difference between the Russell indices needs to be examined as this is the foundation for the rest of the empirical analysis. Whilst uncertainty remains about the effect of Russell indices on total institutional ownership, literature has shown significant results that assignment to the Russell 2000 index instead of the Russell 1000 index increases passive ownership. Based on this information, the test can be one-sided. The following hypothesis will be tested first:

[H1] Passive institutional ownership is significantly higher for firms that are in the top of the Russell 2000 index than for firms that are in the bottom of the Russell 1000 index.

If significant results are found for this hypothesis, then this implies that the use of a two-stage approach, such as an IV or fuzzy discontinuity approach, is justified. However, if no significant results are found, then this would imply that there could be a biased first-stage estimator.

2.4 Managerial entrenchment

The separation of ownership and control facilitated managers with the possibility to pursue value-destroying myopic behavior that is driven by selfish incentives. Boards have attempted to minimize this problem through managerial payout structures (Jensen and Meckling, 1976; Demsetz, 1983) and dividend structures (Easterbrook, 1984; Jensen, 1986). By increasing the equity payout of controlling managers, the incentive to pursue value-destroying options would decrease as managerial compensation is more closely tied to firm performance. Stock options thus align the interest of managers and shareholders. This does however result in increased voting power for management, which decreases the possibility of managerial turnover (Demsetz, 1983; Fama and Jensen, 1983; Farinha, 2003). This increase in power illustrates one of the main concepts of the managerial entrenchment theory. This paper follows the definition of Berger et al. (1997) for managerial entrenchment, where they state that managerial entrenchment is the inability of corporate governance codes to impose managerial discipline.

Current literature has not found a clear consensus on the effect of passive ownership on managerial entrenchment.[1] Appel et al. (2016a) concluded that passive ownership is associated with lower returns in M&A announcements, more independent directors, removal of takeover defenses, more equal

[1] Appendix A shows a literature review table of all available papers (to my knowledge) that investigate the effect of passive ownership or passive blockholders on managerial entrenchment.

voting rights and an increase in the aggressiveness of activism campaigns. The authors hypothesize that these findings result from the influence that passive ownership levels exert on investor activism of other investors. Because passive investors are unable to vote with their feet, they are more incentivized to side with the activist in a proxy voting.

These results, along with the subsequent explanation, are also found by Strampelli (2018). He states that passive institutional investors have a higher level of shareholder meeting engagements than active institutional investors, but that they do not analyze the firms on an individual level. Instead, these passive investors use a one-size-fits-all approach that is based on low-cost general principles.

On the other hand, Qin and Wang (2018) concluded that passive institutional ownership increases managerial entrenchment as this type of investors negatively influences the managers' incentive scheme within the firm. Their results indicated that both the pay-for-performance sensitivity and performance-turnover sensitivity decreased as a result of an increase in passive ownership. As uncertainty about the effect of passive institutional ownership on managerial entrenchment remains present, the following two-sided hypothesis will be tested:

[H2] Passive institutional ownership significantly affects the level of managerial entrenchment.

One issue instantly arises with this hypothesis, as managerial entrenchment is difficult to formulize in a testable matter. Florackis and Ozkan (2009) constructed a managerial entrenchment index, which was based on testable determinants that indicate the presence of managerial entrenchment. However, they differentiated between both the proportion and the type of blockholders in the construction of their index, which implies that their index cannot be used in this paper. Because the managerial entrenchment index cannot be used, managerial entrenchment will be tested using certain proxies that were also included in the index.

Although several determinants for managerial entrenchment have been used in the index, the literature has shown no clear consensus on the effectivity and significance of some of them. Some evidence has been found that entrenched managers benefit from classified and staggered boards (Faleye, 2007), but Bates et al. (2008) did not find any significant results. The leverage ratio of entrenched managers also remains a topic of interest. Research favors the theory that entrenched CEOs seek lower than optimal leverage ratios (Berger et al., 1997; Wang, 2011). However, John and Litov (2010) used an IV-approach and concluded the opposite. They found evidence that entrenched managers receive better access to debt markets and obtain better financing terms which in turn resulted in higher debt levels. Ji et al. (2020) found that the level of diversification in a firm determines the sign of the relationship between leverage and managerial entrenchment, as a positive relation is

found only in diversified firms. Because of the uncertainty regarding the effects of these possible determinants, they will not be used in this analysis.

The first determinant for managerial entrenchment that will be analyzed is CEO tenure. Entrenched CEOs generally have a higher tenure (Ellili, 2012; Di Meo et al., 2017; Salehi et al., 2018; Ehikioya et al., 2021), as they are more likely to manage a firm which contains both takeover defenses (e.g., golden parachute and poison pills) and limitations in shareholders' voting power. Berger et al. (1997) also state that a CEO is increasingly able to exert internal governance as CEO tenure increases.

Hu and Kumar (2004) investigated the effects of managerial entrenchment on payout policy. They found a significantly positive effect of managerial entrenchment on both the likelihood and the level of payouts. This is closely related to CEO stock options, which is a proxy variable that is used in other papers. Berger et al. (1997) stated that there was a negative correlation between stock options and managerial entrenchment, implying that higher levels of stock options relate to lower entrenchment. However, the increase in human capital indicates that stock option limits the ability to impose managerial discipline and introduces entrenched managers to a less profitable but more conservative operation style (Bertrand & Mullainathan, 2003). Bebchuk et al. (2011) formulated the CEO Pay Slice (CPS), which is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives. They concluded that CPS could provide a useful tool to study firm behavior. For this reason, CPS will be the second determinant of managerial entrenchment.

Antounian et al. (2021) examined the effects of managerial entrenchment on CEO turnover-performance sensitivity and found evidence that the likelihood of CEO turnover decreased when excess entrenchment was present. They measured managerial entrenchment by employing the E-index of Bebchuk et al. (2009), which is based on six anti-takeover provisions. Other research concluded that this index is only a partial determinant for managerial entrenchment (Di Meo et al., 2017), which implies that the results of Antounian et al. (2021) should be met with caution. Qin and Wang (2018) examined the effect of passive ownership on turnover-performance sensitivity and concluded that this sensitivity decreased as passive ownership increased.

The expectation is that passive ownership will significantly affect managerial entrenchment. If CEO tenure and CPS increase due to passive ownership, along with a decrease in the forced CEO turnover, then this would imply that passive investors increase managerial entrenchment. If opposite signs are found, then this would imply that passive ownership decreases managerial entrenchment.

2.5 Passive blockholders

The most prominent passive investment strategy is that of index investing, where investors replicate broad market indices. These index funds originate from the 1970s and were popularized in 1990 by the introduction of the exchange-traded fund (ETF). This introduction simplified the index replication process for investors, as it allowed them to trade index funds as if they were stocks. These ETFs have been steadily growing in popularity and Bloomberg even foresees passive investment overtaking active investment within the next decade (Bloomberg Intelligence, 2021).

This rise in popularity of passive index investment strategies has resulted in increased relative index ownership. As some of these passive index funds have passed the 5% ownership threshold, they can also be defined as passive blockholders. ETFs introduce transparency and clarity to their investors, as they are merely a replication of the underlying fund composition. This does however come at a price, as their implicit transparency removes the possibility of influencing firm level decision-making to a certain degree. As stated by Edmans and Holderness (2017), passive blockholders are unable to exert governance through 'exit' as they are required to hold stocks in proportion to their index capitalization, and they are less incentivized to govern through 'voice' due to their dispersed ownership.

In order to analyze the effect of passive blockholders on managerial entrenchment, we will first establish whether firms show significant differences in passive blockholder ownership based on their Russell assignments. Appel et al. (2016b) found that total ownership of passively managed mutual funds and ETFs is around 40% higher for stocks at the top of the Russell 2000 relative to that of firms at the bottom of the Russell 1000. However, the effect of Russell indices on total passive blockholder ownership has not been tested yet. It is therefore not possible to assign a sign to this effect. The first hypothesis on passive blockholders will thus be:

[H3] Firms that are in the top of the Russell 2000 index differ significantly in passive blockholder ownership than the lowest firms of the Russell 1000 index.

This hypothesis needs to be examined first as a significant difference in passive blockholder ownership between the indices is required in order to research the effect of this difference. If this is not the present, then the statistical two-stage tests that were previously used in passive ownership papers would not be valid here. This would imply that the effect of passive blockholder ownership on managerial entrenchment cannot be analyzed. Previous literature has predominantly looked at the proportion of ETF ownership. Although this type of investor is passive by design, previous literature did not add the requirement that these index funds should pass the blockholder threshold of 5% ownership. Edmans and Holderness (2017) even advocate to use lower ownership thresholds in future

analysis as the 5% threshold is not based on any theoretical foundation. For these reasons, three different thresholds will be tested to determine the effect of passive blockholders. These ownership thresholds will be 1%, 3% and 5%. After determining the effect of Russell assignments on passive blockholders, the effect of this type of investor on managerial entrenchment can be analyzed.

The effect of passive blockholders on managerial entrenchment remains uncertain. Appendix A shows a literature review table of all available papers that examine the effect of either passive investors or passive blockholders on managerial entrenchment. There have been some theoretical papers that stated that passive blockholders[2] lack incentive for stewardship behavior and are more likely to side with the managers (Bebchuk et al., 2017; Bebchuk & Hirst, 2019). This results in voting behavior of passive funds that defers power to management and is suboptimal for their investors. These theoretical frameworks indicate that an increase in passive blockholder ownership should be associated with higher levels of managerial entrenchment.

Heath et al. (2022) also found empirical results for these economic theories, as they concluded that index funds are 11.30% more likely than actively managed funds to vote with management on compensation policies. On top of that, index funds were less likely to vote against managerial entrenchment votes such as the removal of poison pills and golden parachutes. Their results indicated that index funds facilitate managers to become more entrenched.

Schmidt and Fahlenbrach (2017) concluded that an exogenous shock in passive blockholders is associated with a reduction in high-cost governance activities. They stated that an increase in passive blockholder ownership resulted in lower M&A announcement returns, decreased independent director appointments and a higher likelihood for the CEO to also become Chairman or President.

Whilst these studies indicate the possible negative influences of index funds, there are also several papers that found opposing results. Some economic theories have concluded that the (increasing) rise in popularity of these index funds has resulted in a change of incentives, which in turn has altered their voting behavior. Kahan and Rock (2020) stated that index funds have become more financially incentivized to be well-informed. Their increased scale has increased the importance of their voting behavior, whilst their increased scope has improved the spillover effects of information as improved voting behavior can become more generally applicable.

[2] Most of the papers mentioned in this section looked at passive mutual funds and/or ETFs, without stating that their research was about passive blockholders. Although most of them did not use an ownership threshold of 5% in their empirical analysis, these papers can nonetheless be seen as passive blockholder research as the increased popularity of these funds has caused them to obtain large enough shares for this not to be a necessity.

Barzuza et al. (2019) concluded that index funds, whilst being generally passive, have a leading role in opposing management on board diversity and corporate sustainability. They state that these funds attempt to govern to millennials, as this generation of (future) investors show less interest in returns and more interest in social problems than previous generations. This change in behavior from index funds causes management to showcase less myopic behavior.

Appel et al. (2016a) stated that an increase in ownership of index funds is associated with more independent directors, a decrease in takeover defenses and a lower likelihood of dual class shares. They also concluded that index ownership constituted to a lower support for management proposals and a higher support for governance proposals. Their results are consistent with the idea that index funds only govern through voting using low-cost general principles that do not require individual firm analysis.

Appel et al. (2016b) hypothesize that index ownership influences activism campaigns due to their large shares and their implicit voting behavior that results from the change in agency costs. As index funds are likely to apply general rules to their voting behavior, activist campaigns that align their interests to that of an index fund can obtain higher levels of votes. The authors concluded that whilst the frequency of activist campaigns does not change significantly, the aggressiveness of these campaigns does increase. The presence of index funds increases both the likelihood and acceptance rate of activist campaigns that pursue changes to corporate control. On the other hand, this presence decreases the likelihood of campaigns that involve more incremental changes.

Corum et al. (2021) estimated an economical model in which market participants were able to allocate money to either passive or active funds, or to save their money. They concluded that passive funds increase passive governance only if they crowd out private savings. If the passive funds crowded out active funds, then this would result in a decrease in corporate governance. Therefore, differences in the empirical results found in previous papers could be caused by differences in the alternative funding behavior of investors. On top of that, both the findings of Barzuza et al. (2019), and Schmidt and Fahlenbrach (2021) indicate that the effect of passive blockholders differs in the dimension of corporate governance. It is therefore not certain what effect passive blockholders will have on managerial entrenchment. For this reason, a two-sided test should be used. This leads to the following hypothesis:

[H4] Passive blockholder ownership has a significant effect on managerial entrenchment.

No prior research has studied the effect of passive blockholders on managerial entrenchment. Previous papers have only looked at the effect on corporate governance in general. This is an

important addition to the current literature, as the effect of the current trend of the relative and absolute increase in passive blockholders remains ambiguous. For both active and quasi-investors, it is necessary to understand this effect as it might influence the risk-return profiles of their investments. Previous literature has shown that activists do respond to the presence of fund (passive) investors. If other investors do not incorporate this information, then they would be using an inefficient information set which could lead to subpar investment strategies. On top of that, regulators can also benefit from these findings. If passive blockholders do not effectively combat managerial entrenchment, then this might imply that increased regulation is required. The determinants for managerial entrenchment that will be used equal that in the analysis of passive investors. This implies that the dependent variables will be CEO tenure, CPS and forced CEO turnover.

3 Data

3.1 Construction of the dataset

This paper looks at the Russell constituents from 1998 through 2019. The starting year is based on available observations of the necessary databases. In this case, the ISS blockholder ownership database determined the starting year as it only contains observations from 1998 onwards. The last year is based on the final year in which Covid was not present in America, as the first case was found in March 2020. The foundation of the data is based on constructing the Russell 1000 and the Russell 2000. As the distribution of these indices is proprietary, the rankings must be estimated through publicly available market capitalization data. This data closely follows the empirical results of Glossner (2020), which concluded that the closest predicator for the end-of-May Russell rankings combines CRSP daily and CompuStat daily. End-of-May total market capitalization is thus determined by multiplying stock prices from CRSP by shares outstanding from CompuStat. The float-adjusted market capitalization in June is determined through the adjustment factors from CompuStat Monthly and if unavailable, the closest quarter in CompuStat quarterly. Russell has some requirements for the firms to be included in any of their indices (Russell FTSE, 2022). Firms are removed if they contain a minimum closing price of $1 or less, if their end-of-May total market capitalization equals $30 million or lower, or if their float is less than 5%.

Annual firm characteristics are obtained from the CompuStat Daily Updates – Fundamentals Annual database. Firm size is measured as the natural logarithm of total assets at the beginning of the year and cash flow equals the depreciation plus earnings before extraordinary items. R&D expenses are determined with the XRD data. A dummy variable for missing R&D values is made, which equals 1 if

XRD is missing and it equals 0 if XRD is not missing. If the dummy variable R&D missing equals 1, R&D is set to 0. Firm age is determined as the first available year in Compustat that contains observations of that firm. Tobin's Q is calculated by dividing the market value of assets by the book value of assets. The market value of assets is defined as the total assets plus the market value of equity minus the book value of equity. The market value of equity is determined by the product of the common shares outstanding and the fiscal year closing price. The book value of equity equals the stockholders' equity minus preferred stock liquidating value plus balance sheet deferred taxes and investment tax credit minus post retirement assets. The book value of assets equals total assets. Annual stock returns are calculated by taking the cumulative returns of monthly stock prices from the CRSP Monthly Stock database. Cumulative Abnormal Stock Returns (CAR) is calculated by subtracting the CAR median value at the two-digit standard industrial classification (SIC) level.

Data on institutional ownership is retrieved from the Thomson Reuters Spectrum 13f dataset. Ownership is determined based on the observations in September, two months after the Russell reconstitution. Total institutional ownership equals the percentage of outstanding shares held by institutional investors. Thomson Reuters s12 mutual fund database is used to calculate the proportion of passive institutional investors to total institutional investors. Passive institutional investors are determined based on the methodology of Appel et al. (2020). Specifically, a mutual fund is labelled as a passive fund if the name of the fund includes a certain string.[3] In addition to previous studies I also added the string "3000", which contributed just above 116,000 observations to the institutional ownership dataset. If there was no observation of institutional ownership from Thomson Reuters Spectrum 13f, then total institutional ownership was retrieved from Thomson Reuters s12 by adding total passive ownership with total active ownership. Institutional investors were labelled as blockholder01, blockholder03 or blockholder05 if they owned at least 1%, 3% or 5%, respectively. These blockholders were then split into either active or passive blockholders. Quasi-blockholders were not considered as they are not of interest in this study. This type of blockholder was automatically integrated into the active blockholder groups. Three variables for passive blockholder ownership were constructed, by taking the total ownership of all passive blockholders (grouped at the 1%, 3% or 5% level) of a firm in a year.

[3] *Based on Appel et al. (2016a), the following strings are used: Index, Idx, Indx, Ind_ (where_ indicates a space), Russell, S & P, S and P, S&P, SandP, SP, DOW, Dow, DJ, MSCI, Bloomberg, KBW, NASDAQ, NYSE, STOXX, FTSE, Wilshire, Morningstar, 100, 400, 500, 600, 900, 1000, 1500, 2000, 3000, and 5000*

CEO characteristics are retrieved from the ExecuComp Annual Compensation database. This database contains data on CEO tenure, gender and age. Compensation data is also obtained, which is used to calculate CPS. CPS equals the proportion of CEO total compensation compared to the top 5 compensated managers. Because ExecuComp is fairly limited in total observations compared to the main dataset, Capital IQ is added. This database contains more information on compensation structures and CEO characteristics, but it lacks CEO tenure. If there is no observation from ExecuComp, then the observation of Capital IQ is taken. If there are duplicate observations, then the value from ExecuComp is used.

After finalizing all included observations, variables that contained values that are not economically credible were adjusted. The yearly cumulative stock return was winsorized on the 95% level as it contained extremely high levels that cannot be explained by economic theory. This adjustment lowered the mean from 35815.73 to 1.164, which is closer to the average yearly market return. The variables firm age, firm size, Tobin's q, cashflow and investments have been winsorized at the 1% and 99% level to decrease the influence of irrational values. This adjustment removed all negative values of firm size, firm age and capital expenditures and it reduced the mean of Tobin's Q from 10.39 to 2.06 as the latter variable contained values that were infeasibly high. The proportional variables institutional ownership, passive ownership and active ownership have been winsorized at the 99% level to account for inconsistent values that were above 1.

In order to account for the possibility of multicollinearity, a Pearson correlation table was produced (see Appendix B). This correlation matrix indicated that capital and capital expenditures might be highly correlated, as their correlation equals 0.840. The main variable of interest in this paper is total passive ownership, which is used as dependent variable to test for multicollinearity. The Variance Inflation Factors (VIF) were retrieved from a simple OLS regression model which contained passive ownership as dependent variable. The independent variables consisted of the other variables of the correlation matrix in Appendix B. Capital Expenditures and Capital obtained VIF values of 3.97 and 3.81, respectively, whilst all other values were below two. In untabulated results, both variables were singularly removed from the regression. These two regressions indicated that capital should not be included as a control variable, as the R-squared of the regression only went down by 0.0001 when it was removed. Descriptions of all variables used in the analysis can be found in Appendix C.

3.2 Summary statistics

Summary statistics of the finalized dataset can be found in Table 1. Panel A of this Table shows a summary of the firm characteristics. The total amount of observations equal 66,000, as there are 3,000

firms per year in the Russell 1000 and Russell 2000 combined. There are no variables that equal the maximum number of observations, other than the two market capitalization variables that were used for the Russell assignments. However, all firm characteristic variables contain observations within the range of 64.68% to 76,96% of the total observations. The minimum range would have been lower if adjustments were not made for Research and Development, as illustrated by the notion that the dummy variable R&D Missing has a mean value of 0.54. Other adjustments, such as winsorizing certain variables, seem to have supported the dataset as no strange statistics can be found in the firm characteristics.

Table 1

Summary statistics

This table reports the summary statistics of all key variables in the total dataset. Definitions of these variables can be found in Appendix C. Information on the winsorized variables can be found in Section 3.1.

A. Firm Characteristics	Full Sample					
	Obs.	Mean	Median	Std. Dev.	Min	Max
Firm Size*	44,678	8.36	8.21	1.74	4.74	13.39
Firm Age*	50,795	30.02	18	32.85	1	163
Capital	48,262	3,089	371.6	8,104.75	0	55,728
CAPEX*	48,262	480.80	60.13	1,324.95	0	9,410
Cashflow	44,686	583.45	125.48	1,553.10	-1,619	10,217
Tobin's Q*	43,210	2.06	1.50	1.64	0.73	10.73
R&D**	48,262	176.19	0	857.95	0	$3.59e^{4}$
R&D Missing	48,262	0.54	1	0.50	0	1
Total MktCap	66,000	$3.46e^{4}$	3,486	$4.12e^{5}$	373.82	$5.61e^{7}$
Float-adjusted MktCap	66,000	$3.17e^{4}$	3,388	$4.07e^{5}$	20.16	$5.53e^{7}$
CAR	42,687	$3.36e^{-3}$	0	0.51	-2.97	2.60

B. Ownership structure	Full Sample					
	Obs.	Mean	Median	Std. Dev.	Min	Max
Institutional Ownership*	40,357	0.21	0.20	0.14	$1.04e^{-8}$	0.59
Active Ownership*	38,734	0.16	0.15	0.11	$1.25e^{-8}$	0.45
Passive Ownership*	38,925	0.04	0.03	0.05	$2.21e^{-10}$	0.18
Passive Blockholders (1%)	38,925	0.35	0	0.48	0	1
Passive Blockholders (3%)	38,925	0.05	0	0.22	0	1
Passive Blockholders (5%)	38,925	0.03	0	0.16	0	1
PB Ownership (1%)	38,925	0.02	0	0.03	0	0.13
PB Ownership (3%)	38,925	$2.82e^{-3}$	0	0.01	0	0.07
PB Ownership (5%)	38,925	$1.66e^{-3}$	0	0.01	0	0.07

C. Managerial Characteristics	Full Sample					
	Obs.	Mean	Median	Std. Dev.	Min	Max
CEO Age	30,145	55.43	56	7.28	26	96
CEO Gender	23,583	0.97	1	0.16	0	1
CEO Tenure	23,583	6.98	5	6.93	0	61
CEO Forced Turnover	30,650	0.10	0	0.30	0	1
CEO Pay Slice	30,570	0.38	0.38	0.12	0.04	0.81

** Variable has been winsorized.*

*** Variable contains values of 0 if they were missing from the dataset*

Panel B of Table 1 shows summary statistics on ownership structure variables. Although the observations for each variable are less than that of Panel A, they still constitute around 58.69% of the total observations. The number of observations of institutional investors is 4.19% higher than other ownership structure variables, as is the only ownership variable that was obtained from two datasets. On average, firms are owned for 20.63% by institutional investors. This ownership is divided between active (15.91%) and passive investors (4.44%), where active investors consist of both active and quasi-investors. Over the entire dataset, 35.08% of the observations comprise of a firm that has at least one passive blockholder when using the threshold of 1%. This amount decreases to 5.35% and 2.69% when the threshold changes to 3% and 5%, respectively. The total ownership of these passive blockholders remains very minimal, as ownership of 1% passive blockholder is only 1.62% on average. This once again decreases to 0.28% and 0.17% when using a threshold of 3% and 5%, respectively. This is most likely caused by the fact that more than half of the observations does not contain a passive blockholder of any threshold, as can be seen by the median value of 0 in all these passive blockholder variables.

The last panel of Table 1, Panel C, shows the summary statistics of managerial characteristics. From this panel we can denote that 97.23% of all CEO observations are male with an average age of 55.43 years. The average CEO tenure equals 6.98 years, while almost 1 in every 10 CEOs is forced to exit their company every year. On average, a CEO earns 38% of the top five most paid managers. The proportion of observations is the lowest in Panel C, which illustrates an underlying problem with analysis on managerial characteristics. The ex-ante problems in the data collection caused by the Thomson databases might yield inefficient ex-post results in analyses. Nonetheless, enough observations have been retrieved for this to be a noteworthy, but minimal issue.

4 Methodology

4.1 Annual Russell index assignments

This paper will also look at the Russell indices for exogenous changes in passive ownership. These indices were introduced in 1984 and are maintained by FTSE Russell (FTSE Russell, 2022). The Russell 3000 index is comprised of the 3000 largest publicly held companies in America and represents around 97% of the total American public equity market. The Russell 1000 index consists of the thousand largest public US firms, whilst the Russell 2000 index is comprised of the following 2000 firms.

All Russell indices are value weighted and at the last Friday of June an annual reconstitution takes place. FTSE Russell uses end-of-May total market capitalizations for the index assignment. Successively, index weights are determined by using the float-adjusted market capitalization measured at the end of June. These market capitalizations are float-adjusted to account for outstanding shares that are not available for purchase, which makes the indices more liquid and investable. Historical reconstitution dates and rank dates can be found in Appendix D. This data is retrieved from Ben-David et al. (2019).

A third determinant of the Russell 1000 and 2000 assignments and rankings was added in 2006 to account for negative effects of index turnover. At first, the index assignment is still based on end-of-May total market capitalization. Secondly, they look at the 1,000th and 1,001st cutoff for index turnover. Specifically, a stock will be included in the Russell 1000 (Russell 2000) unless that stock was in the Russell 2000 (Russell 1000) last year and its cumulative market capitalization is above (below) the cumulative market capitalization of the 1,001st (1,000th) firm by less than 2.5 percent point of the cumulative market capitalization of the Russell 3000E index. This index includes up to the 4,000 the largest US equity securities and contains close to 99% of the total public US equity market. This new determinant has been implemented since 2007 and is referred to as “banding” by Russell (FTSE Russell, 2022). Appel et al. (2020) state that this implementation requires Russell 2000 firms to obtain a market capitalization higher than the 800th largest firm to be assigned to the Russell 1000. On the other end, Russell 1000 firms need a market capitalization around the 1,200th largest firm to be reassigned to the Russell 2000 index.

Because all Russell indices are determined by market capitalization, firms at the bottom of the Russell 1000 index and the firms at the top of the Russell 2000 index are expected to share close resemblance. Researchers assume that only subtle differences between the firms determine the index assignment. Firms on either side of the threshold can thus be considered as if they were randomly assigned. Because these indices are value weighted, the annual reconstitution of the Russell 1000 and Russell 2000 generates heterogeneity in ownership structure between the two sides close to the cutoff. This

is based on both the discontinuity in index weights around the threshold and the relatively larger amount of assets under management in the Russell 2000 benchmark compared to the Russell 1000 (Chang et al., 2015; Glossner, 2020). This implies that effects of ownership structure can be studied by comparing the top of the Russell 2000 with the bottom of the Russell 1000.

4.2 Passive Ownership

The first hypothesis determines whether the proportion of passive ownership changes significantly when a firm is added to the Russell 2000 index. Unfortunately, the probability of joining the Russell 2000 is not certain as the Russell rankings are proprietary. This implies that CRSP/Compustat market capitalization does not optimally reflect the actual Russell rankings. This hypothesis will thus be tested using a fuzzy regression discontinuity design based on end-of-May rankings (Chang et al., 2015; Wei and Young, 2018). The equations of the two stages are as follows:

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t} \quad (1)$$

$$PO_{i,t} = a_1 + \beta_4 \widehat{R2000}_{i,t} + \beta_5 Rank_{i,t}^{May} + \beta_6 \widehat{R2000}_{i,t} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t} \quad (2)$$

$R2000_{i,t}$ is a dummy variable that equals 1 if firm *i* is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $PredictR2000_{i,t}$ is a dummy variable that indicates whether $Rank_{i,t}^{May}$ predicts Russell 2000 membership, where $Rank_{i,t}^{May}$ is the ranking of firm *i* in year *t* based on the end-of-May total market capitalization. $PO_{i,t}$ is the proportion of passive ownership to total ownership of firm *i* after the reconstitution in year *t*, on a scale from 0 to 1. v_t equals the year dummies, whilst $u_{i,t}$ and $\varepsilon_{i,t}$ represent the error term. This hypothesis will also be used to test what level of bounds should be used. Previous literature has used a bandwidth ranging from 50 to 400. Ben-David et al. (2019) concluded that a bandwidth of 50 is too small for significant changes in passive ownership, which is why this will not be included in the analysis. The bandwidths of interest are that of 100, 200, 300 and 400 firms.

The second hypothesis measures the effect of passive investors on managerial entrenchment. Entrenchment will be examined using CEO tenure, CPS and forced CEO turnover. The hypothesis will be tested following the IV approach from Appel et al. (2016a, 2020). Glossner (2020) stated three possible modifications that would yield better results, of which two will be adjusted for in this design. Firstly, the end-of-May rankings will be used instead of the June rankings as independent variable. Secondly, the end-of-May market capitalization is based on both CRSP and Compustat data to generate better estimates of the true May Russell rankings. Glossner also stated that the bandwidth should be selected based on the unadjusted May ranks. However, this would result in different subgroups being analyzed as the fuzzy discontinuity design uses the (expected) float-adjusted June rankings for the bandwidths. For this reason, the third modification will not be implemented. Nonetheless, the effect of the latter will be examined as a robustness check. The two-stage equation of the IV approach is as follows:

$$PO_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_n \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t} \quad (3)$$

$$CEOtenure_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t} \quad (4)$$

$PO_{i,t}$ is the proportion of passive ownership to total ownership at the end of the first quarter of the reconstitution year *t*, on a scale from 0 to 1. $R2000_{i,t}$ is a dummy variable that equals 1 if firm *i* is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm *i*'s end-of-May total market capitalization in year *t* and $Rank_{i,t}^{May}$ is the ranking of firm *i* in year *t* based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. The dependent variable of the second equation, $CEOtenure_{i,t}$, represents the tenure of the CEO of firm *i* in year *t*. For the analysis of CPS and forced CEO turnover, the same statistical design will be used. The first-stage equation will remain the same as equation (3). The second-stage equation will differ only in the dependent variables, leading to the following two

equations:

$$CPS_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t} \quad (5)$$

$$CEOturnover_{i,t+1} = \alpha_1 + \beta_3 \widehat{PO_{i,t}} + \beta_2 CAR_{i,t} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t} \quad (6)$$

In the first equation, $CPS_{i,t}$ represents the CEO Pay Slice of firm *i* in year *t.* This is determined as the proportion of total payout to the CEO compared to the total payout of the 5 highest paid executives. The second-stage dependent variable $CEOturnover_{i,t+1}$ is a dummy variable that equals 1 if the CEO of firm *i* was forced to exit the company in the timeframe of *t* to *t+1*. $CAR_{i,t}$ represents the cumulative abnormal stock returns of firm *i* in year *t*. This equals the cumulative monthly stock return of firm *i* minus the two-digit SIC industry median cumulative monthly stock return of firm *i.*

4.3 Passive Blockholders

The third hypothesis examines the effect of Russell index assignments on passive blockholder ownership. The methodology of the first hypothesis is used to test this, with the exception that the dependent variable of Equation (2) is now based on passive blockholder ownership. This results in a two-stage fuzzy discontinuity design, where the first-stage equation is Equation (1). The second-stage equation is as follows:

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = a_1 + \beta_4 \widehat{R2000_{i,t}} + \beta_5 Rank_{i,t}^{May} + \beta_6 \widehat{R2000_{i,t}} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t} \quad (7)$$

The three corresponding dependent variables are $PB_{i,t}^{1}$, $PB_{i,t}^{3}$ and $PB_{i,t}^{5}$. They are determined using an ownership threshold of 1%, 3% and 5%, respectively. For example, $PB_{i,t}^{1}$ equals the proportion of shares held by passive blockholders using an ownership threshold of 1%. All independent variables and error terms are the same as in Equation (2).

The last hypothesis investigates the effect of passive blockholders on managerial entrenchment. The methodology that will be used closely follows that of the previous analysis on passive ownership, except that in this case the dependent variable $PB_{i,t}$ shows the proportion of the total shares that is owned by passive blockholders. As there are three different thresholds for a passive blockholder, three different variables are constructed for the analysis. This results in the following first-stage equation:

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_{n} \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t} \quad (8)$$

The dependent and independent variables have been explained previously, whilst both v_t and $u_{i,t}$ still represents the yearly fixed effects and the error term, respectively. The three second-stage equations that follow from this are as follows:

$$\sum_{k=1}^{3} CEOtenure_{i,t}^{2k-1} = a_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} + \sum_{n} l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t} \quad (9)$$

$$\sum_{k=1}^{3} CPS_{i,t}^{2k-1} = a_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} + \sum_{n} l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t} \quad (10)$$

$$\sum_{k=1}^{3} CEOturnover_{i,t}^{2k-1} = \alpha_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} +$$
$$\sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \beta_5 CAR_{i,t} + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

(1)

All variables have been previously explained as these equations are equal to equation (4), (5) and (6), and differ only in the predicted variable of the first stage. Where the previous equations used the predicted value of passive ownership, these variables instead predict the ownership levels of passive blockholders. The second stage once again looks at three different thresholds for passive blockholders, which equal the ownership threshold of the predicted first-stage variable.

5 Results

5.1 Passive ownership

5.1.1 Effect of the Russell indices

The first hypothesis looks at the effect of being assigned to either the Russell 1000 or the Russell 2000 on passive ownership. Table 2 shows the results of the fuzzy regression discontinuity regression based on end-of-May rankings, with different bandwidths implemented in each column. Panel A shows the effect of the Russell assignments on institutional ownership. No significant results were found in Panel A for any bandwidth, which is in line with previous literature that used methodology with strong estimators. This has some explanatory strength, because it showcases that the dataset most likely fits that of previous papers. This is important to note, as the Russell rankings are proprietary, and it is therefore not certain that the correct dataset is comprised. Panel B shows the main dependent variable of interest, which is the change in total passive ownership based on Russell assignments. All four coefficients of $\widehat{R2000}_{i,t}$ are positive, and two of these four coefficients are both statistically and economically significant. Table 2 Panel B indicates that assigning a firm to the Russell 2000 instead of the Russell 1000 results in an increase in passive ownership of 1.47% to 3.48%. The fourth column is significant at the 5% level and in line with previous papers. For example, Appel et al. (2016a) found around a 1.50% increase in passive ownership using a bandwidth of 250.

Table 2

This table reports estimates of a two-stage fuzzy discontinuity regression of ownership structures on an indicator for Russell 2000 index assignment. Panel A and panel B report the estimates of total institutional ownership and passive institutional ownership, respectively. Specifically, the following

two-stage fuzzy regression discontinuity design is being estimated in panel B (note that the dependent variable of the second equation is different for panel A):

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t}$$

$$PO_{i,t} = a_1 + \beta_4 \widehat{R2000}_{\iota,t} + \beta_5 Rank_{i,t}^{May} + \beta_6 \widehat{R2000}_{\iota,t} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t}$$

where $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $PredictR2000_{i,t}$ is a dummy variable that indicates whether $Rank_{i,t}^{May}$ predicts Russell 2000 membership, where $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May total market capitalization. $PO_{i,t}$ is the proportion of passive ownership to total ownership of firm i after the reconstitution in year t, on a scale from 0 to 1. v_t equals the year dummies, whilst $u_{i,t}$ and $\varepsilon_{i,t}$ represent the error term.

Panel A	Institutional ownership			
	(1)	(2)	(3)	(4)
$\widehat{R2000}$	0.10	0.055	0.029	0.019
	(0.10)	(0.065)	(0.039)	(0.025)
May Rankings	$4.51e^{-5}$	$4.52e^{-5}$	$6.32e^{-5}$ **	$5.86e^{-5}$ ***
	($7.93e^{-5}$)	($4.96e^{-5}$)	($2.83e^{-5}$)	($1.82e^{-5}$)
Interaction Term	$-1.15e^{-4}$	$-5.10e^{-5}$	$-3.03e^{-5}$	$-1.98e^{-5}$
	($1.02e^{-4}$)	($6.63e^{-5}$)	($3.91e^{-5}$)	($2.49e^{-5}$)
Bandwidth	100	200	300	400
Observations	2,663	5,351	7,969	10,552
R^2	0.18	0.19	0.20	0.20

Panel B	Passive ownership			
	(1)	(2)	(3)	(4)
$\widehat{R2000}$	0.024	0.035**	0.013	0.015**
	(0.030)	(0.019)	(0.011)	($7.35e^{-3}$)
May Rankings	$1.27e^{-5}$	$2.12e^{-5}$	$1.45e^{-5}$ *	$1.30e^{-5}$ **
	($2.41e^{-5}$)	($1.45e^{-5}$)	($8.23e^{-6}$)	($5.29e^{-6}$)
Interaction Term	$-2.54e^{-5}$	$-3.31e^{-5}$ *	$-1.23e^{-5}$	$-1.33e^{-5}$ *
	($3.10e^{-5}$)	($1.94e^{-5}$)	($1.14e^{-5}$)	($7.27e^{-6}$)
Bandwidth	100	200	300	400
Observations	2,583	5,187	7,725	10,225
R^2	0.35	0.36	0.37	0.37

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

5.1.2 Managerial entrenchment

One of the main goals of this paper is to establish the effect of passive ownership on managerial entrenchment. Because it is not possible to use the managerial entrenchment index constructed by Florackis and Ozkan (2009), three testable determinants for managerial entrenchment have been established. The determinants are CEO tenure, CPS and forced CEO turnover. Three models are constructed that all follow a two-stage IV approach, where passive ownership is determined in the first stage using different Russell index assignments.

First, we will establish the strength of the instrument. Testing the null hypothesis that β_1 in Equation (3) equals 0 results in a F-statistic of 5.95, indicating that the instrument is significantly different from 0 when looking at the entire sample. This F-statistic drops to 4.01 when using bounds of 400 and it drops even further to 1.47 when bounds of 200 are used, implying a weak instrument when using a bandwidth of 200 as it falls outside of the 10% significance level. This implies that the results found using a bandwidth should be met with caution. Nonetheless, this bandwidth will be used in this section as an assumption for the analysis is that firms on either side of the threshold should show close resemblance. A bandwidth of 400 would most likely violate this assumption. As a robustness check, bounds of 400 will be tested in Section 5.3.2 along with control variables of firm characteristics to account for this assumption violation.

Table 3 reports the estimates of the second-stage regression of the instrumental variable estimation with CEO Tenure as dependent variable. The first column shows the classic OLS regression of the two-stage fuzzy discontinuity approach, whilst the second column has year fixed effects added. The third and fourth column also contain year fixed effects, but the third column also has robust standard errors clustered at the firm level. In column four, these standard errors are clustered at the two-digit SIC levels. All second-stage coefficients for the first-stage estimator $\widehat{PO_{i,t}}$ are statistically insignificant, implying that no conclusive remarks can be made about the effect of passive ownership on CEO tenure.

Table 3

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive investors on CEO tenure. The two-stage equations are as follows:

$$PO_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_{n} \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$CEOtenure_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$PO_{i,t}$ is the proportion of passive ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. The dependent variable of the second equation, $CEOtenure_{i,t}$, represents the tenure of the CEO of firm i in year t.

Panel A	CEO Tenure			
	(1)	(2)	(3)	(4)
$\widehat{PO_{i,t}}$	-9.99	-6.14	113.81	124.28
	(8.12)	(122.16)	(156.50)	(229.01)
$Rank_{i,t}^{May}$	2.20e^{-3} **	-6.85e^{-3}	-8.03e^{-3}	-8.48e^{-3}
	(1.08e^{-3})	(6.78e^{-3})	(5.53e^{-3})	(6.08e^{-3})
$Ln\left(MktCap_{i,t}\right)$	1081.63	359.93	84.54	32.53**
	(891.99)	(1112.10)	(864.72)	(15.41)
$Ln\left(MktCap_{i,t}\right)^2$	-48.56	-16.85	-4.44	-2.74**
	(39.59)	(49.39)	(38.40)	(1.38)
$Ln\left(MktCap_{i,t}\right)^3$	0.73	0.26	0.073	0.057*
	(0.59)	(0.73)	(0.57)	(0.032)
R&D	7.01e^{-4}	6.83e^{-4}	5.65e^{-4}	1.05e^{-3}
	(4.78e^{-4})	(4.86e^{-4})	(1.13e^{-3})	(8.19e^{-4})
Firm Age	-0.013***	-0.014***	2.25e^{-3}	-0.011**
	(3.20e^{-3})	(3.29e^{-3})	(3.37e^{-3})	(4.62e^{-3})
Firm Size	-0.55***	-0.55***	-0.48**	-0.73***
	(0.15)	(0.16)	(0.23)	(0.19)
Capex	-3.82e^{-4} **	-3.81e^{-4} **	-7.52e^{-4} ***	-1.76e^{-4}
	(1.84e^{-4})	(1.85e^{-4})	(2.34e^{-4})	(2.21e^{-4})
Cashflow	3.24e^{-5}	2.61e^{-5}	1.29e^{-4}	4.80e^{-5}
	(1.52e^{-4})	(1.53e^{-4})	(1.20e^{-4})	(1.18e^{-4})
Tobin's Q	0.18*	0.19*	0.11	0.11
	(0.10)	(0.10)	(0.10)	(0.13)
CEO Age	0.40***	0.40***	0.50***	0.41***
	(0.015)	(0.015)	(0.032)	(0.035)
CEO Gender	2.50***	2.51***	1.54*	2.19***
	(0.73)	(0.74)	(0.85)	(0.69)
Constant	-8046.55	-2529.51	-506.55	0
	(6697.91)	(8357.81)	(6494.09)	(omitted)
Year FE	No	Yes	Yes	Yes

Firm FE	No	No	Yes	No
Industry FE	No	No	No	Yes
Observations	3,434	3,434	3,434	3,434
R^2	0.19	0.19	0.18	0.19

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Table 3 shows that both the age and gender of the CEO have a significant effect on CEO tenure, as both independent variables are significant in all four models. If the CEO is male, then this is associated with an increase in CEO tenure of 1.54 to 2.51 years. On the other hand, if a CEO is 1 year older then this would increase CEO tenure by 0.40 to 0.50 years, ceteris paribus. Whilst CEO age seems to have a positive effect on tenure, results on the age of the firm show a (small) negative effect on CEO tenure. On top of that, both firm size and capital expenditures also seem to have a negative effect on tenure. The latter could be based on CEO overconfidence. Previous literature has stated that an abundance of internal funds leads to more value-destroying behavior of overconfident CEOs, resulting in more CEO turnover due to worse abnormal returns.

The second determinant for managerial entrenchment is CPS, which is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives. The expectation is that entrenched managers would use their power to increase their total compensation, relative to the compensation of other executives. Table 4 reports the second-stage regression estimates with CPS as dependent variable. The methodological approach, independent variables and model specifications are equal to Table 3. All coefficients of the first-stage estimator for passive ownership are positive. Two of these four coefficients are both statistically and economically significant. They indicate that CPS increases by 6.37 to 6.42 percent point for every 1 percent point increase in passive ownership. Being assigned to the Russell 2000 instead of the Russell 1000 would then yield an increase in CPS of 22.16 to 22.33 percent points.

Table 4

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive investors on CEO Pay Slice (CPS). The two-stage equations are as follows:

$$PO_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_n \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$CPS_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$PO_{i,t}$ is the proportion of passive ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. The dependent variable of the second equation, $CPS_{i,t}$, represents the CEO Pay Slice of firm i in year t. CPS is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives.

Panel A	CEO Pay Slice (CPS)			
	(1)	(2)	(3)	(4)
$\widehat{PO_{i,t}}$	0.20	6.42***	2.56	6.37**
	(0.16)	(2.42)	(3.20)	(3.00)
$Rank_{i,t}^{May}$	$3.23e^{-5}$	$4.96e^{-5}$	$5.10e^{-5}$	$4.18e^{-5}$
	($2.15e^{-5}$)	($1.34e^{-4}$)	($1.08e^{-4}$)	($1.40e^{-4}$)
$Ln\left(MktCap_{i,t}\right)$	0.41	3.13	-0.44	-0.087
	(17.71)	(22.02)	(0.27)	(0.28)
$Ln\left(MktCap_{i,t}\right)^2$	$-1.51e^{-3}$	-0.14	0.039*	$6.76e^{-3}$
	(0.79)	(0.98)	(0.023)	(0.024)
$Ln\left(MktCap_{i,t}\right)^3$	$-2.09e^{-4}$	$2.01e^{-3}$	$-8.23e^{-4}$	$-1.08e^{-4}$
	(0.012)	(0.014)	($5.12e^{-4}$)	($5.32e^{-4}$)
R&D	$-1.44e^{-5}$	$-1.20e^{-5}$	$-2.81e^{-5}$	$-1.21e^{-5}$
	($9.49e^{-6}$)	($9.62e^{-6}$)	($1.83e^{-5}$)	($1.19e^{-5}$)
Firm Age	$-6.40e^{-5}$	$-3.10e^{-5}$	$-1.87e^{-4}$ **	$-3.12e^{-5}$
	($6.35e^{-5}$)	($6.52e^{-5}$)	($8.25e^{-5}$)	($1.06e^{-4}$)
Firm Size	$-3.55e^{-3}$	$-2.55e^{-3}$	$-7.91e^{-4}$	$-2.53e^{-3}$
	($3.06e^{-3}$)	($3.13e^{-3}$)	($4.56e^{-3}$)	($5.65e^{-3}$)
Capex	$-1.29e^{-6}$	$-1.15e^{-6}$	$-3.26e^{-6}$	$-1.15e^{-6}$
	($3.64e^{-6}$)	($3.65e^{-6}$)	($5.40e^{-6}$)	($4.55e^{-6}$)
Cashflow	$2.88e^{-6}$	$2.93e^{-6}$	$4.40e^{-6}$	$2.93e^{-6}$
	($3.01e^{-6}$)	($3.04e^{-6}$)	($3.82e^{-6}$)	($2.85e^{-6}$)
Tobin's Q	$-7.45e^{-3}$ ***	$-6.82e^{-3}$ ***	$-2.80e^{-3}$	$-6.82e^{-3}$ **
	($1.98e^{-3}$)	($2.02e^{-3}$)	($2.68e^{-3}$)	($3.04e^{-3}$)

CEO Age	$5.13e^{-4}$ *	$4.90e^{-4}$	$3.53e^{-4}$	$4.91e^{-4}$
	($3.03e^{-4}$)	($3.04e^{-4}$)	($4.56e^{-4}$)	($5.85e^{-4}$)
CEO Gender	$8.07e^{-4}$	$8.27e^{-4}$	0.023	$7.94e^{-4}$
	(0.015)	(0.015)	(0.023)	(0.020)
Constant	-5.61	-24.15	0	0
	(133.00)	(165.52)	(omitted)	(omitted)
Year FE	No	Yes	Yes	Yes
Firm FE	No	No	Yes	No
Industry FE	No	No	No	Yes
Observations	3,434	3,434	3,434	3,434
R^2	0.02	0.03	0.03	0.03

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

One important note to consider is that the R^2 is relatively low in all four models, as no model seems to explain more than 3.50% of the variation in CPS. This implies that although passive ownership shows a significantly positive effect, it does not explain much of the variability in CPS. The models lack the explanatory power to confidentially state the true effect of passive ownership, as omitted variables that might be correlated to both CPS and passive ownership could inflate the coefficient of passive ownership. Nonetheless, Table 4 indicates that there is significant evidence that passive ownership positively affects CPS.

The third and final proxy for managerial entrenchment used in this paper is forced CEO turnover. The expectation is that entrenched CEOs are more capable at keeping their job during worse performance than CEOs that are not entrenched. Table 5 reports estimates of the second-stage regressions with forced CEO turnover as dependent variable. The coefficients in Columns (2) to (4) are economically and statistically significant. The results support the previously mentioned expectation that passive ownership has a negative effect on forced CEO turnover. They indicate that CEO turnover decreases by 12.62 to 15.23 percent point for every 1 percent point increase in passive ownership. Being assigned to the Russell 2000 index instead of the Russell 1000 index would result in a decrease in forced CEO turnover of 43.94 to 52.98 percent points.

Table 5

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive investors on forced CEO turnover. The two-stage equations are as follows:

$$PO_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_n \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$CEOturnover_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + \beta_5 CAR_{i,t} + v_t + \varepsilon_{i,t}$$

where $PO_{i,t}$ is the proportion of passive ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. $CAR_{i,t}$ represents the cumulative abnormal stock returns of firm i in year t. This equals the cumulative monthly stock return of firm i minus the two-digit SIC industry median cumulative monthly stock return of firm i. The dependent variable of the second equation, $CEOturnover_{i,t}$, is a dummy variable representing forced turnover of the CEO of firm i in year t.

Panel A	Forced CEO Turnover			
	(1)	(2)	(3)	(4)
$\widehat{PO_{i,t}}$	0.63	-12.62**	-15.23***	-12.73**
	(0.42)	(6.36)	(6.44)	(6.32)
$CAR_{i,t}$	-9.33e^{-3}	-8.30e^{-3}	-6.21e^{-3}	-8.28e^{-3}
	(0.012)	(0.013)	(0.015)	(0.016)
$Rank_{i,t}^{May}$	-1.18e^{-4} **	-2.76e^{-4}	-3.05e^{-4}	-2.91e^{-4}
	(5.67e^{-5})	(3.53e^{-4})	(3.13e^{-4})	(3.16e^{-4})
$Ln\left(MktCap_{i,t}\right)$	-14.08	5.88	-0.19	-0.21
	(46.64)	(57.86)	(0.70)	(0.54)
$Ln\left(MktCap_{i,t}\right)^2$	0.61	-0.24	0.033	0.034
	(2.07)	(2.57)	(0.061)	(0.047)
$Ln\left(MktCap_{i,t}\right)^3$	-8.92e^{-3}	3.01e^{-3}	-1.01e^{-3}	-1.00e^{-3}
	(0.031)	(0.038)	(1.33e^{-3})	(1.06e^{-3})
R&D	3.14e^{-6}	-2.18e^{-6}	-7.22e^{-6}	-2.24e^{-6}
	(2.49e^{-5})	(2.53e^{-5})	(2.25e^{-5})	(1.56e^{-5})
Firm Age	9.62e^{-4} ***	8.75e^{-4} ***	9.37e^{-4} ***	8.75e^{-4} ***
	(1.67e^{-4})	(1.71e^{-4})	(2.23e^{-4})	(1.90e^{-4})
Firm Size	6.24e^{-3}	5.37e^{-3}	2.44e^{-3}	5.40e^{-3}
	(8.07e^{-3})	(8.25e^{-3})	(9.40e^{-3})	(7.67e^{-3})
Capex	-3.75e^{-7}	-1.54e^{-6}	-2.54e^{-6}	-1.54e^{-6}
	(9.57e^{-6})	(9.60e^{-6})	(1.01e^{-5})	(6.08e^{-6})
Cashflow	-9.69e^{-6}	-8.10e^{-6}	-7.88e^{-6}	-8.10e^{-6}
	(7.92e^{-6})	(7.99e^{-6})	(7.40e^{-6})	(8.15e^{-6})
Tobin's Q	2.51e^{-4}	-5.82e^{-4}	-1.48e^{-3}	-5.75e^{-4}
	(5.28e^{-3})	(5.37e^{-3})	(6.22e^{-3})	(6.06e^{-3})
CEO Age	-8.65e^{-3} ***	-8.52e^{-3} ***	-9.21e^{-3} ***	-8.52e^{-3} ***
	(7.96e^{-4})	(7.98e^{-4})	(8.88e^{-4})	(8.86e^{-4})
CEO Gender	-0.084**	-0.086**	-0.084*	-0.086*
	(0.038)	(0.038)	(0.046)	(0.045)

Constant	108.60 (350.23)	-45.82 (434.86)	0 (omitted)	0 (omitted)
Year FE	No	Yes	Yes	Yes
Firm FE	No	No	Yes	No
Industry FE	No	No	No	Yes
Observations	3,434	3,434	3,434	3,434
R^2	0.05	0.05	0.05	0.05

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Several independent variables are significant in both Table 3 and Table 5. Intuitively, this seems to make sense as characteristics that decrease the chance of forced CEO turnover directly increase CEO tenure and vice versa. As such, the signs of firm age, CEO age and CEO gender in Table 7 are opposite to those in Table 5 but both significant. One concern that arises from these findings, is that the same effect is being examined using different formulations as dependent variable. To examine this, CEO tenure was added to the model specifications of Table 5. In untabulated results, no conclusive evidence was found for this concern. Coefficients of passive ownership remained similar after the addition of CEO tenure as independent variable. It increased from -15.23 to -14.23 in Column (3) and decreased from -12.73 to -12.75 in Column (4). In both cases, the coefficient for the predictor of passive ownership remained significant after the addition.

5.2 Passive Blockholders

5.2.1 Effect of the Russell indices

Section 5.2 investigates the effect of Russell index assignments on passive blockholders, and the effect of these blockholders on managerial entrenchment. In order to analyze the latter, the former must be established. For the analysis in this section, passive blockholders are split into three groups that are determined by using an ownership threshold of 1%, 3% and 5%.

Table 6 reports the second stage predicted effect of the Russell assignments on the proportion of shares held by passive blockholders. The three different panels indicate different threshold levels for what constitutes a blockholder. Each column corresponds to different bandwidths used. Panel A shows the effect of Russell index assignments on the proportion of shares held by passive blockholders that surpass the threshold of 5% ownership. All four coefficients contain a negative sign, whilst the two coefficients with the highest bandwidths are also statistically significant at the 5% level. The results indicate that an assignment to the Russell 2000 instead of the Russell 1000 will result in a decrease of 5% passive blockholder ownership of 0.30 to 0.48 percent points.

Table 6

This table reports estimates of a two-stage fuzzy discontinuity regression of passive blockholder ownership on an indicator for Russell 2000 index assignment. Panel A, B and C report the estimates of total passive blockholder ownership using ownership thresholds of 5%, 3% and 1%, respectively. Specifically, the following two-stage fuzzy regression discontinuity design is being estimated:

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t}$$

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = a_1 + \beta_4 \widehat{R2000}_{\iota,t} + \beta_5 Rank_{i,t}^{May} + \beta_6 \widehat{R2000}_{\iota,t} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t}$$

where $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $PredictR2000_{i,t}$ is a dummy variable that indicates whether $Rank_{i,t}^{May}$ predicts Russell 2000 membership, where $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May total market capitalization. $\sum_{k=1}^{3} PB_{i,t}^{2k-1}$ is the proportion of passive blockholder ownership to total ownership of firm i after the reconstitution in year t, on a scale from 0 to 1. The three different dependent variables represent different ownership threshold for what constitutes a blockholder. This corresponds to thresholds of blockholders containing at least 1%, 3% or 5% ownership of the firm. v_t equals the year dummies, whilst $u_{i,t}$ and $\varepsilon_{i,t}$ represent the error term.

Panel A	Passive blockholders (5%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{\iota,t}$	-4.39e^{-3}	-4.62e^{-3}	-4.83e^{-3} **	-2.99e^{-3} **
	(6.18e^{-3})	(3.15e^{-3})	(2.11e^{-3})	(1.36e^{-3})
May Rankings	-3.90e^{-6}	-2.89e^{-6}	-2.82e^{-6} *	-2.14e^{-6} **
	(5.12e^{-6})	(2.42e^{-6})	(1.45e^{-6})	(9.48e^{-7})
Interaction Term	4.39e^{-6}	4.87e^{-6}	4.98e^{-6} **	3.18e^{-6} **
	(6.34e^{-6})	(3.20e^{-6})	(2.09e^{-6})	(1.32e^{-6})
Bandwidth	100	200	300	400
Observations	2,583	5,187	7,725	10,225
R^2	0.02	0.02	0.03	0.03

Panel B	Passive blockholders (3%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{\iota,t}$	-1.53e^{-3}	-2.47e^{-4}	-3.26e^{-3}	-2.37e^{-3}
	(7.14e^{-3})	(3.88e^{-3})	(2.62e^{-3})	(1.68e^{-3})
May Rankings	-2.35e^{-6}	7.17e^{-8}	-2.77e^{-6}	-1.98e^{-6} *
	(5.92e^{-6})	(2.98e^{-6})	(1.86e^{-6})	(1.17e^{-6})
Interaction Term	1.42e^{-6}	5.42e^{-7}	3.72e^{-6}	2.72e^{-6} *
	(7.32e^{-6})	(3.94e^{-6})	(2.60e^{-6})	(1.63e^{-6})
Bandwidth	100	200	300	400
Observations	2,583	5,187	7,725	10,225
R^2	0.02	0.02	0.03	0.03

Panel C	Passive blockholders (1%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{i,t}$	-4.16e^{-3}	0.015*	1.46e^{-3}	7.11e^{-3} **
	(0.015)	(8.53e^{-3})	(5.49e^{-3})	(3.48e^{-3})
May Rankings	-8.04e^{-6}	1.27e^{-5} *	9.98e^{-6} **	9.70e^{-6} ***
	(1.26e^{-5})	(6.98e^{-6})	(4.05e^{-6})	(2.52e^{-6})
Interaction Term	3.34e^{-6}	-1.47e^{-5} *	-1.97e^{-6}	-6.82e^{-6} **
	(1.52e^{-5})	(8.79e^{-6})	(5.53e^{-6})	(3.45e^{-6})
Bandwidth	100	200	300	400
Observations	2,583	5,187	7,725	10,225
R^2	0.40	0.41	0.41	0.41

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Panel B of Table 6 reports the second-stage results of Russell assignments on passive blockholders with a threshold of 3% ownership. In this panel, all four coefficients of the first stage predicted Russell assignments are insignificant. For this reason, the 3% threshold for blockholders will not be used in the rest of this section.

Panel C reports the effect of Russell index assignments on the proportion of shares held by passive blockholders that have surpassed the threshold of 1% ownership. Two of the four coefficients on first-stage predictor of the Russell 2000 assignment are significant and positive. Analysis on bounds of 200 and 400 concluded that 1% passive blockholder ownership increased by 1.50% and 0.71%, respectively. As both the 1% threshold and 5% threshold obtained statistically and economically significant results using a bandwidth of 400, this bandwidth and these thresholds will be used in further analysis.

5.2.2 Managerial entrenchment

In this Section, the effect of passive blockholders on managerial entrenchment is examined. The methodology is comparable to that of Section 5.1.2. Once again, the proxies for managerial entrenchment are CEO tenure, CPS and forced CEO turnover. Contrary to previous expectation, we cannot make any predictions on the expected signs of the effect of passive blockholders. The extensive list of literature on passive investors allowed predictions to be made, but passive blockholders contains only a handful of research papers. On top of that, research on the level of diffuse ownership has indicated that the ex-ante proportional ownership levels of blockholders could influence their ex-post effects on corporate governance. This is further illustrated by the findings of Table 6, as Russell

assignments have opposite effects on different threshold levels for blockholders. For this reason, all tests in Section 5.2.2 are two-sided.

All models follow a two-stage IV approach, where passive ownership is determined in the first stage using different Russell index assignments. Just as in Section 5.1.2, we must first establish the strength of the instrument for both ownership thresholds. First, we look at the 1% ownership threshold for blockholders. Testing the null hypothesis that β_1 in Equation (8) equals 0 results in a F-statistic of 27.67 over the entire sample, which decreases to 24.23 in the subsample with a bandwidth of 400. Nonetheless, the instrument seems to be strong enough. This seems less plausible when looking at a threshold of 5% ownership, as the F-statistic of the entire sample equals 3.07. This value drops to 2.59 if bandwidths of 400 are used. Although it is still significant at the 10% level, interpretation of the results should be met with caution as the instrument is not as strong as the instrument in the 1% ownership threshold analysis. This is further illustrated by the fact that on average, only 0.17% of total shares are held by 5% passive blockholders. Total firms that contained at least one 5% passive blockholder was the highest in 2016, with a total of 146 firms. The minimum amount was in 2010, when only one firm had a passive blockholder with at least 5% ownership. These statistics indicate that the total observations for 5% passive blockholders is minimal, which negatively impacts the statistical inference. This issue will be further addressed as a robustness check in Section 5.3.3.

Table 7 reports the estimates of the second-stage regression of the IV estimation to identify the effect of passive blockholders on CEO tenure. The methodology in this Table is closely related to Table 3, except that the dependent variable now is passive blockholder ownership. There are two dependent variables, one for the proportion of shares held by passive blockholders that own at least 1% of the company, and another dependent variable with a threshold of 5%. These different dependent variables are represented by Columns (1) to (3) and Columns (4) to (6), respectively. Columns (1) and (4) report the classic OLS regression of the two-stage IV approach with the addition of year fixed effects. Columns (2) and (5) contain year fixed effects with robust standard errors clustered at the firm level. In Columns (3) and (6), these standard errors are clustered at the two-digit SIC levels. All models are estimated using a bandwidth of 400. This design will be used in all tables of this section.

Table 7

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive blockholders on CEO tenure. The two-stage equations are as follows:

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_{n} \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$\sum_{k=1}^{3} CEOtenure_{i,t}^{2k-1} = \alpha_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} + \sum_{n} l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \beta_5 CAR_{i,t} + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

where $\sum_{k=1}^{3} PB_{i,t}^{2k-1}$ is the proportion of passive blockholder ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. The three different dependent variables represent different ownership threshold for what constitutes a blockholder. This corresponds to thresholds of blockholders containing at least 1%, 3% or 5% ownership of the firm. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. The dependent variable of the second equation, $CEOtenure_{i,t}$, represents the tenure of the CEO of firm i in year t. Once again there are three different dependent variables, one for each threshold of what constitutes a passive blockholder.

CEO Tenure	1% Threshold			5% Threshold		
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PB_{i,t}}$	74.90	192.82*	223.66	-504.43	-1.30e^{3} *	-1.51e^{3}
	(96.04)	(102.58)	(175.11)	(646.80)	(690.83)	(1.18e^{3})
$Rank_{i,t}^{May}$	-1.75e^{-3}	-5.72e^{-3}	-5.77e^{-3}	3.74e^{-3}	8.41e^{-3} *	0.011
	(4.06e^{-3})	(3.93e^{-3})	(5.24e^{-3})	(4.77e^{-3})	(4.99e^{-3})	(8.76e^{-3})
$Ln\left(MktCap_{i,t}\right)$	339.94	-61.83	400.44	435.53	184.26	685.89
	(353.62)	(355.14)	(442.62)	(363.40)	(375.73)	(519.37)
$Ln\left(MktCap_{i,t}\right)^2$	-15.68	1.83	-18.93	-19.21	-7.26	-29.48
	(15.62)	(15.72)	(19.68)	(15.97)	(16.46)	(22.44)
$Ln\left(MktCap_{i,t}\right)^3$	0.24	-0.015	0.30	0.28	0.097	0.43
	(0.23)	(0.23)	(0.29)	(0.23)	(0.24)	(0.33)
R&D	4.32e^{-5}	-2.82e^{-4}	4.68e^{-4}	4.32e^{-5}	-2.82e^{-4}	4.68e^{-4}
	(2.98e^{-4})	(6.29e^{-4})	(5.30e^{-4})	(2.98e^{-4})	(6.29e^{-4})	(5.30e^{-4})
Firm Age	-0.015***	1.95e^{-3}	-0.011***	-0.015***	1.95e^{-3}	-0.011***
	(2.41e^{-3})	(2.62e^{-3})	(3.07e^{-3})	(2.41e^{-3})	(2.62e^{-3})	(3.07e^{-3})
Firm Size	-0.62***	-0.45**	-0.79***	-0.62***	-0.45**	-0.79***
	(0.12)	(0.20)	(0.17)	(0.12)	(0.20)	(0.17)
Capex	-2.58e^{-4} **	-5.97e^{-4} ***	5.22e^{-5}	-2.58e^{-4} **	-5.97e^{-4} ***	5.22e^{-5}
	(1.21e^{-4})	(1.84e^{-4})	(1.88e^{-4})	(1.21e^{-4})	(1.84e^{-4})	(1.88e^{-4})
Cashflow	7.98e^{-5}	1.39e^{-4} *	9.88e^{-5} **	7.98e^{-5}	1.39e^{-4} *	9.88e^{-5} **
	(7.51e^{-5})	(7.49e^{-5})	(4.85e^{-5})	(7.51e^{-5})	(7.49e^{-5})	(4.85e^{-5})

Tobin's Q	0.24***	0.095	0.17	0.24***	0.095	0.17
	(0.074)	(0.096)	(0.11)	(0.074)	(0.096)	(0.11)
CEO Age	0.44***	0.49***	0.44***	0.44***	0.49***	0.44***
	(0.011)	(0.029)	(0.037)	(0.011)	(0.029)	(0.037)
CEO Gender	2.30***	2.05***	2.17***	2.30***	2.05***	2.17***
	(0.52)	(0.74)	(0.79)	(0.52)	(0.74)	(0.79)
Constant	$-2.46e^3$	617.98	$-2.80e^3$	$-3.32e^3$	$-1.60e^3$	$-5.37e^3$
	($2.67e^3$)	($2.68e^3$)	($3.32e^3$)	($2.77e^{-3}$)	($2.87e^3$)	($4.03e^3$)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	No	Yes	No
Industry FE	No	No	Yes	No	No	Yes
Observations	6,887	6,887	6,887	6,887	6,887	6,887
R^2	0.21	0.19	0.21	0.21	0.19	0.21

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Table 7 shows that the coefficients of the estimated first-stage passive blockholder ownership variables are significant in two out of six models. This is the case for both threshold parameters when the model contains year fixed effects with standard errors clustered at the firm level. Both coefficients are significant at the 10% level. Column (2) reports that a 1 percent point increase in 1% passive blockholder ownership results in an increase of CEO tenure of 1.93 years, which indicates that this coefficient is also economically significant. Table 6 reported an increase in 1% passive blockholder ownership of 0.71%, which would result in an increase in CEO tenure of 1.37 years. Column (5) reports the effect of a change in passive blockholder ownership that contain at least 5% ownership. Although this coefficient is significant at the 10% level, it is very close to zero and therefore economically insignificant.

The R^2 for both Column (2) and (5) equals 0.1914, which is close to the R^2 of the related results of Table 3 on passive ownership. This raises the concern that the variability in the dependent variable is explained by the control variables, instead of the passive blockholder variable. In untabulated results, the main independent variable $\widehat{PB_{\iota,t}}$ was removed. Removal of this first-stage estimate resulted in a decrease of the R^2 of 0.0003 for both thresholds, implying that an insignificant amount of the variability in CEO tenure is explained by passive blockholder ownership.

The second determinant of managerial entrenchment is CPS. Table 8 reports the results of the second-stage regressions of the IV estimation for the effect of passive blockholder ownership on CPS. Four out of six coefficients are significant at the 5% level. The results indicate that passive blockholders with a 1% ownership threshold positively affect CPS, whilst passive blockholder with a 5% ownership threshold negatively influence CPS. The coefficients of Columns (1) and (3) state that a one percent

point increase in 1% passive blockholder ownership increases CPS by 4.38 to 4.48 percent point. Assigning a firm to the Russell 2000 would result in an increase of CPS by 3.11 to 3.18 percent point due to the change in 1% passive blockholder ownership. Columns (4) and (6) report a decrease in CPS of 29.51 to 30.14 percent point if 5% passive blockholder ownership increases by 1 percent point. Table 8 reported a decrease in 5% passive blockholder ownership of 0.30% after the Russell 2000 assignment, resulting in a CPS increase of 8.85 to 9.04 percent points. This implies that the change in 5% passive blockholder ownership caused by the Russell index assignments has more effect on CPS than the change in 1% passive blockholder ownership.

Table 8

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive blockholders on CEO Pay Slice (CPS). CPS is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives. The two-stage equations are as follows:

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_{n} \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$\sum_{k=1}^{3} CEOturnover_{i,t}^{2k-1} = \alpha_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} + \sum_{n} l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \beta_5 CAR_{i,t} + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

where $\sum_{k=1}^{3} PB_{i,t}^{2k-1}$ is the proportion of passive blockholder ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. The three different dependent variables represent different ownership threshold for what constitutes a blockholder. This corresponds to thresholds of blockholders containing at least 1%, 3% or 5% ownership of the firm. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. The dependent variables of the second equation, $CPS_{i,t}$, represent the CEO Pay Slice of firm i in year t. CPS is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives. Once again there are three different dependent variables, one for each ownership threshold of what constitutes a passive blockholder.

CPS	1% Threshold			5% Threshold		
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PB_{i,t}}$	4.38**	1.23	4.48**	-29.51**	-8.29	-30.14**
	(1.82)	(2.33)	(1.93)	(12.29)	(15.72)	(13.02)
$Rank_{i,t}^{May}$	-9.97e^{-5}	1.95e^{-5}	-9.21e^{-5}	2.21e^{-4} **	1.10e^{-4}	2.36e^{-4} **
	(7.72e^{-5})	(8.72e^{-5})	(8.62e^{-5})	(9.06e^{-5})	(1.11e^{-4})	(1.09e^{-4})

$Ln(MktCap_{i,t})$	3.08	-0.27	3.57	8.67	1.30	9.28
	(6.72)	(6.52)	(8.29)	(6.90)	(7.20)	(8.89)
$Ln(MktCap_{i,t})^2$	-0.15	0.013	-0.17	-0.36	-0.045	-0.39
	(0.30)	(0.29)	(0.37)	(0.30)	(0.31)	(0.39)
$Ln(MktCap_{i,t})^3$	$2.37e^{-3}$	$-1.86e^{-4}$	$2.77e^{-3}$	$4.91e^{-3}$	$5.30e^{-4}$	$5.38e^{-3}$
	($4.38e^{-3}$)	($4.27e^{-3}$)	($5.41e^{-3}$)	($4.45e^{-3}$)	($4.57e^{-3}$)	($5.68e^{-3}$)
R&D	$1.04e^{-6}$	$-5.51e^{-6}$	$-1.76e^{-5}$	$1.04e^{-6}$	$-5.51e^{-6}$	$-1.76e^{-5}$
	($5.65e^{-6}$)	($1.01e^{-5}$)	($1.19e^{-5}$)	($5.65e^{-6}$)	($1.01e^{-5}$)	($1.19e^{-5}$)
Firm Age	$-7.28e^{-5}$	$-2.60e^{-4}$ ***	$-9.33e^{-5}$	$-7.28e^{-5}$	$-2.60e^{-4}$ ***	$-9.33e^{-5}$
	($4.57e^{-5}$)	($5.67e^{-5}$)	($7.14e^{-5}$)	($4.57e^{-5}$)	($5.67e^{-5}$)	($7.14e^{-5}$)
Firm Size	$-4.97e^{-3}$ **	$-3.12e^{-3}$	$5.96e^{-3}$	$-4.97e^{-3}$ **	$-3.12e^{-3}$	$5.96e^{-3}$
	($2.20e^{-3}$)	($3.55e^{-3}$)	($3.67e^{-3}$)	($2.20e^{-3}$)	($3.55e^{-3}$)	($3.67e^{-3}$)
Capex	$3.08e^{-6}$	$1.41e^{-7}$	$-2.30e^{-6}$	$3.08e^{-6}$	$1.41e^{-7}$	$-2.30e^{-6}$
	($2.29e^{-6}$)	($3.81e^{-6}$)	($4.74e^{-6}$)	($2.29e^{-6}$)	($3.81e^{-6}$)	($4.74e^{-6}$)
Cashflow	$1.32e^{-6}$	$1.90e^{-6}$	$1.02e^{-6}$	$1.32e^{-6}$	$1.90e^{-6}$	$1.02e^{-6}$
	($1.43e^{-6}$)	($1.92e^{-6}$)	($1.38e^{-6}$)	($1.43e^{-6}$)	($1.92e^{-6}$)	($1.38e^{-6}$)
Tobin's Q	$-6.39e^{-3}$ ***	$-2.21e^{-3}$	$-2.94e^{-3}$	$-6.39e^{-3}$ ***	$-2.21e^{-3}$	$-2.94e^{-3}$
	($1.41e^{-3}$)	($2.12e^{-3}$)	($2.05e^{-3}$)	($1.41e^{-3}$)	($2.12e^{-3}$)	($2.05e^{-3}$)
CEO Age	$3.17e^{-4}$	$4.18e^{-5}$	$2.57e^{-4}$	$3.17e^{-4}$	$4.18e^{-5}$	$2.57e^{-4}$
	($2.09e^{-4}$)	($3.31e^{-4}$)	($3.53e^{-4}$)	($2.09e^{-4}$)	($3.31e^{-4}$)	($3.53e^{-4}$)
CEO Gender	$5.02e^{-3}$	0.026	$6.98e^{-3}$	$5.02e^{-3}$	0.026	$6.98e^{-3}$
	($9.83e^{-3}$)	(0.016)	(0.014)	($9.83e^{-3}$)	(0.016)	(0.014)
Constant	-20.25	2.15	-23.54	-70.62	-12.00	-75.00
	(50.79)	(49.16)	(62.61)	(52.56)	(55.41)	(68.01)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	No	Yes	No
Industry FE	No	No	Yes	No	No	Yes
Observations	6,887	6,887	6,887	6,887	6,887	6,887
R^2	0.02	0.02	0.02	0.02	0.02	0.02

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Important to note is that the R^2 of all six models does not surpass 2.50%, implying that only a small amount of the total variation in CPS is explained in the models. In untabulated results, removal of $\widehat{PB_{i,t}}$ in all four Columns with significant coefficients results in a reduction of R^2 that is equal to 0.008. In absolute terms, the addition or removal of this variable leads to an insignificant change. In relative terms however, this removal constitutes to a change in R^2 of 3.23% to 4.08%. The variability in CPS seems to be difficult to formulize and test, which implies that the change in R^2 still shows some explanatory power.

The third and final determinant for managerial entrenchment in this paper is forced CEO turnover. Table 9 reports the estimates of the second-stage regression of the instrumental variable estimation

to identify the effect of passive blockholder ownership on forced CEO turnover. All six coefficients of $\widehat{PB_{i,t}}$ are significant at the 5% level. The firsts three coefficients that determine passive blockholders using a 1% threshold are negative, whilst the coefficients with a 5% threshold are all positive. The results indicate that a one percent point increase in ownership of 1% passive blockholders decreases the expectancy of forced CEO turnover by 9.31 to 10.92 percent points. This implies that assigning a firm to the Russell 2000 instead of the Russell 1000 would result in a decrease in CEO turnover of 6.52 to 7.64 percent points due to the change in 1% passive blockholder ownership. On top of that, 5% passive blockholder ownership decreases by 0.30% according to Table 6. This change would result in a further decrease in CEO turnover of 1.93 to 2.21 percent points.

Table 9

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive blockholder on forced CEO turnover. The two-stage equations are as follows:

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_{n} \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$\sum_{k=1}^{3} CEOturnover_{i,t}^{2k-1} = \alpha_1 + \beta_3 \sum_{k=1}^{3} \widehat{PB_{i,t}^{2k-1}} + \beta_4 Rank_{i,t}^{May} + \sum_{n} ln \left(Ln\left(MktCap_{i,t}\right)\right)^n + \beta_5 CAR_{i,t} + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

where $\sum_{k=1}^{3} PB_{i,t}^{2k-1}$ is the proportion of passive blockholder ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. The three different dependent variables represent different ownership threshold for what constitutes a blockholder. This corresponds to thresholds of blockholders containing at least 1%, 3% or 5% ownership of the firm. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. $CAR_{i,t}$ represents the cumulative abnormal stock returns of firm i in year t. This equals the cumulative monthly stock return of firm i minus the two-digit SIC industry median cumulative monthly stock return of firm i. The dependent variable of the second equation, $CEOturnover_{i,t}$, is a dummy variable representing forced turnover of the CEO of firm i in year t. Once again there are three different dependent variables, one for each ownership threshold of what constitutes a passive blockholder.

CEO Turnover	1% Threshold			5% Threshold		
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PB_{i,t}}$	-9.72**	-10.92**	-9.31**	65.49**	73.55**	64.43**
	(4.73)	(5.12)	(4.25)	(31.82)	(34.48)	(29.74)
$CAR_{i,t}$	-9.82e^{-3}	-9.05e^{-3}	-9.80e^{-3}	-9.82e^{-3}	-9.05e^{-3}	-9.84e^{-3}
	(9.28e^{-3})	(9.89e^{-3})	(8.81e^{-3})	(9.28e^{-3})	(9.89e^{-3})	(8.82e^{-3})

$Rank_{i,t}^{May}$	$1.89e^{-4}$	$2.22e^{-4}$	$1.45e^{-4}$	$-5.23e^{-4}$ **	$-5.79e^{-4}$ **	$-5.12e^{-4}$ **
	($2.00e^{-4}$)	($2.11e^{-4}$)	($1.74e^{-4}$)	($2.35e^{-4}$)	($2.53e^{-4}$)	($2.24e^{-4}$)
$Ln(MktCap_{i,t})$	12.04	13.81	-0.63	-0.38	-0.13	1.72**
	(17.39)	(18.41)	(0.46)	(17.88)	(19.09)	(0.69)
$Ln(MktCap_{i,t})^2$	-0.50	-0.58	0.057	-0.043	-0.061	-0.13**
	(0.77)	(0.81)	(0.038)	(0.79)	(0.84)	(0.056)
$Ln(MktCap_{i,t})^3$	$6.97e^{-3}$	$8.05e^{-3}$	$-1.26e^{-3}$	$1.32e^{-3}$	$1.70e^{-3}$	$2.66e^{-3}$ **
	(0.011)	(0.012)	($7.96e^{-4}$)	(0.012)	(0.012)	($1.14e^{-3}$)
R&D	$-2.47e^{-5}$ *	$-3.03e^{-5}$ **	$-2.45e^{-5}$ ***	$-2.47e^{-5}$ *	$-3.03e^{-5}$ **	$-2.45e^{-5}$ ***
	($1.47e^{-5}$)	($1.23e^{-5}$)	($6.26e^{-6}$)	($1.47e^{-5}$)	($1.23e^{-5}$)	($6.26e^{-6}$)
Firm Age	$6.92e^{-4}$ ***	$7.49e^{-4}$ ***	$6.93e^{-4}$ ***	$6.92e^{-4}$ ***	$7.49e^{-4}$ ***	$6.93e^{-4}$ ***
	($1.18e^{-4}$)	($1.51e^{-4}$)	($1.64e^{-4}$)	($1.18e^{-4}$)	($1.51e^{-4}$)	($1.64e^{-4}$)
Firm Size	$-3.04e^{-3}$	$-4.51e^{-3}$	$-3.01e^{-3}$	$-3.04e^{-3}$	$-4.51e^{-3}$	$-3.01e^{-3}$
	($5.73e^{-3}$)	($6.59e^{-3}$)	($5.20e^{-3}$)	($5.73e^{-3}$)	($6.59e^{-3}$)	($5.20e^{-3}$)
Capex	$-6.77e^{-8}$	$2.92e^{-6}$	$4.64e^{-8}$	$-6.77e^{-8}$	$2.92e^{-6}$	$4.64e^{-8}$
	($5.94e^{-6}$)	($6.56e^{-6}$)	($7.02e^{-6}$)	($5.94e^{-6}$)	($6.56e^{-6}$)	($7.02e^{-6}$)
Cashflow	$-1.14e^{-5}$ ***	$-1.10e^{-5}$ *	$-1.14e^{-5}$ **	$-1.14e^{-5}$ ***	$-1.10e^{-5}$ *	$-1.14e^{-5}$ **
	($3.70e^{-3}$)	($5.81e^{-6}$)	($5.65e^{-6}$)	($3.70e^{-3}$)	($5.81e^{-6}$)	($5.65e^{-6}$)
Tobin's Q	$-6.06e^{-3}$	$-6.50e^{-3}$	$-6.05e^{-3}$ *	$-6.06e^{-3}$	$-6.50e^{-3}$	$-6.05e^{-3}$ *
	($3.70e^{-3}$)	($4.37e^{-3}$)	($3.56e^{-3}$)	($3.70e^{-3}$)	($4.37e^{-3}$)	($3.56e^{-3}$)
CEO Age	$-8.94e^{-3}$ ***	$-9.76e^{-3}$ ***	$-8.93e^{-3}$ ***	$-8.94e^{-3}$ ***	$-9.76e^{-3}$ ***	$-8.93e^{-3}$ ***
	($5.42e^{-4}$)	($5.90e^{-4}$)	($6.69e^{-4}$)	($5.42e^{-4}$)	($5.90e^{-4}$)	($6.69e^{-4}$)
CEO Gender	-0.071***	-0.066**	-0.070**	-0.071***	-0.066**	-0.070**
	(0.025)	(0.028)	(0.030)	(0.025)	(0.028)	(0.030)
Constant	-95.81	-109.74	0	15.97	15.80	0
	(131.51)	(139.09)	(omitted)	(136.12)	(145.46)	(omitted)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	No	Yes	No
Industry FE	No	No	Yes	No	No	Yes
Observations	6,887	6,887	6,887	6,887	6,887	6,887
R^2	0.05	0.05	0.05	0.05	0.05	0.05

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Based on Table 9, the null hypothesis that institutional ownership of passive blockholders does not have a significant effect on forced CEO turnover can be rejected. There is significant evidence that probability of forced CEO turnover decreases as passive blockholder with a 1% ownership threshold increases. On the other hand, CEO turnover increases as passive blockholder ownership with a 5% ownership threshold increases. The R^2 of all six models equals 0.05, implying that only one twentieth of the variability in forced CEO turnover is explained.

5.3 Robustness checks

5.3.1 The Banding procedure

This section looks at the effect of the banding procedure, which increased the difficulty of index turnover. This could imply that the banding procedure caused the assumption of random index assignment to be violated. This assumption states that firms close to the threshold are randomly assigned, as they have limited influence in their Russell assignments. In order to test this, the dependent variables that will be analyzed are the control variables that are used in the other parts of the analysis. Results found in this section can therefore also be used as a verification for the use of these control variables in Sections 5.1 and 5.2. However, first we examine the effect of the banding procedure on differences in passive ownership between the Russell indices.

The results of this effect can be found in Appendix E. The main conclusion of this table is that all models show positive coefficients for *Banding*, which is the main independent variable of interest. All four coefficients are significant at the 1% level, which implies that there is significant evidence that the banding procedure has a positive effect on passive ownership for firms in the Russell 2000 compared to firms in the Russell 1000. These results only show a relatively positive effect, as it is uncertain if the banding procedure had a positive effect on passive ownership in the Russell 2000, a negative effect on passive ownership in the Russell 1000 or a mixture of both. The models seem to explain relatively much of the variation in passive ownership, as the R^2 is around 36 percent.

Panel A and Panel B of Table 10 showcase the firm characteristics pre-banding and post-banding, respectively. The effect of the banding procedure can be seen as the change in differences between the Russell indices. It is important not to compare these panels directly as this would mostly capture time effects. For example, market capitalization is expected to be higher in Panel B as the general economy is expected to grow over time.

Table 10

Descriptive statistics of the firms that are within 400 bounds of the Russell 1000 and Russell 2000 threshold. These statistics are reported pre-banding and post-banding in Panel A and Panel B, respectively. Definitions of these variables can be found in Appendix C. Panel C reports the second stage estimates of two-stage fuzzy discontinuity regressions of firm characteristics on an indicator for Russell 2000 index assignments and the banding procedure. Specifically, the following regressions are being estimated:

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t}$$

$$\sum \beta_j Control\ Variables_{i,t} = \alpha_0 + \beta_1 \widehat{R2000}_{i,t} + \beta_2 Banding_i + v_t + \varepsilon_{i,t}$$

The $Control\ Variables_{i,t}$ are capital expenditures, firm age, firm size, cashflow, and Tobin's Q. $\widehat{R2000}_{i,t}$ is the expected value of $R2000_{i,t}$ that is determined in the first stage equation. $Banding_i$ is a dummy variable that equals 1 if the observation is after 2006, and 0 if the observations is before or during 2006. Year fixed effects are added as the banding procedure is a time dummy variable. If year fixed effects were not added, then one might capture the systemic differences of these time periods in $Banding_i$. Firm fixed effects are used to account for omitted variables and to further isolate the effect of the banding procedure on the corresponding dependent variables.

A. Pre-banding	Russell 2000				Russell 1000			
	Obs.	Mean	Min	Max	Obs.	Mean	Min	Max
Firm Size	1,357	8.01	4.74	11.65	1,316	8.27	4.74	12.05
Firm Age	1,447	29.03	1	163	1,393	29.15	1	163
CAPEX	1,384	195.98	0	9,410	1,332	264.22	0	8,863
Cashflow	1,359	148.84	-6,690	4,450	1,316	181.18	-8,738	5,226
Tobin's Q	1,332	2.15	0.73	10.73	1,281	2.23	0.73	10.73
Research and Development	1,384	45,69	0	3,031	1,332	60.27	0	1,670
Total Market Capitalization	1,800	3,256	2,027	6,166	1,800	4,721	2,671	9,423
Float-adjusted Market Capitalization	1,800	3,293	237.75	21,855	1,800	4,737	78.64	36,364
CAR	1,403	-0.04	-2.96	2.52	1,310	-0.05	-2.95	2.43

B. Post-banding	Russell 2000				Russell 1000			
	Obs.	Mean	Min	Max	Obs.	Mean	Min	Max
Firm Size	1,637	8.90	4.74	13.39	1,586	9.49	4.74	13.39
Firm Age	1,990	29.78	1	163	1,789	41.22	1	163
CAPEX	1,900	379.78	0	9,410	1,638	696.50	0	9,410
Cashflow	1,637	434.69	-3,115	10,089	1,586	497.65	-10,383	28,636
Tobin's Q	1,597	2.24	0.73	10.73	1,529	1.74	0.73	9.89
Research and Development	1,900	83.86	0	7,769	1,638	245.50	0	14,035
Total Market Capitalization	2,600	9,658	3,549	19,338	2,600	10,361	1,635	20,031
Float-adjusted Market Capitalization	2,600	9,656	286.90	72,265	2,600	10,562	339.14	189,729
CAR	1,569	0.04	-0.94	2.17	1,370	0.00	-1.18	2.23

C. Control variable testing	Dependent variable				
	Capex	Cashflow	Tobin's Q	Firm Age	Firm Size
Banding	492.64***	462.14***	-0.22**	17.35***	1.71***
	(55.54)	(80.09)	(0.10)	(1.65)	(0.05)
$\widehat{R2000}$	-95.18***	-247.71***	-0.28***	1.15	-0.18***
	(19.80)	(49.55)	(0.05)	(1.06)	(0.02)

Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	6,254	5,898	5,739	6,619	5,896
R^2	0.03	0.05	0.02	0.04	0.22

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

The banding implementation was expected to negatively influence index turnover in a way that would cause the bottom of the Russell 1000 to be filled with relatively worse-performing firms whilst the top of the Russell 2000 would contain relatively better-performing firms. The change in Tobin's Q shows that this is most likely the case. The means of Tobin's Q were similar before the banding implementation, but this procedure seems to have negatively influenced the average Tobin's Q of the Russell 1000 compared to the Russell 2000 (1.74 to 2.24, respectively). On average, research and development was only 31.91% higher for Russell 1000 firms. This jumped to 192.75% post-banding. Capital expenditures seems to also have been affected, as the differences in means increased from 34.82% to 83.40%. These two panels show signs that the banding procedure had some effect on firm characteristics. However, this should be tested accordingly.

The results of the empirical testing of the change in difference between the Russell indices can be found in Panel C of Table 10. This panel shows the results of five separate two-stage fuzzy discontinuity regressions. Four out of five dependent variables (capital expenditures, cashflow, firm age and firm size) show changes due to the banding procedure that are significant at the 1% level. Tobin's Q has also changed significantly, but this is only significant at the 5% level. Nonetheless, this panel shows that the banding procedure had a significant effect on the firm characteristics and that it is necessary to add these variables as control variables. There is significant evidence that the firms in the bottom of the Russell 1000 do not share close enough similarities to the firms in the top of the Russell 2000.

5.3.2 Passive Ownership analysis with a bandwidth of 400

The strength of the Russell assignment instrument on passive ownership is tested in the start of Section 5.1.2. The conclusion was that the instrument was weak when the bandwidth was 200 (F-statistic of 1.47) but stronger when bounds of 400 were used (F-statistic of 4.01). Nonetheless, previous results were constructed using a bandwidth of 200 as this would not violate the assumption that firms at either side share close resemblance (or at least violate this assumption to a lesser degree). Nonetheless, it is important to determine whether these results would also be found with a stronger instrument, which is why this section examines the effect of passive ownership on managerial entrenchment using a bandwidth of 400.

Table 11 reports the estimates of the second-stage regression of the instrumental variable estimation to identify the effect of passive institutional ownership on CEO tenure, CPS and forced CEO turnover using a bandwidth of 400. Columns 1, 3 and 5 report estimates using only year fixed effects, whilst the error terms are clustered at the firm level in columns 2, 4 and 6. The results of the Table indicate that the previous conclusions on both CPS and CEO turnover are robust to this adaptation. The coefficients in Table 11 are closer to zero than in Table 4 and 5 for CPS and CEO turnover, respectively. Nonetheless, they remain both economically and statistically significant in three out of four cases. One sidenote is that the increase in passive ownership due to the Russell 2000 assignment is estimated to be lower when using a bandwidth of 400 than a bandwidth of 200.

Table 11

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of institutional ownership by passive investors on CEO tenure, CPS and forced CEO turnover using a bandwidth of 400. The three two-stage equations are the same as in Tables 3, 4 and 5, which leads to the following equations (note that the first-stage equation is equal in all models):

$$PO_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_n \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$CEOtenure_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$$CPS_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$$CEOturnover_{i,t} = a_1 + \beta_3 \widehat{PO_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + \beta_5 CAR_{i,t} + v_t + \varepsilon_{i,t}$$

where $PO_{i,t}$ is the proportion of passive ownership to total ownership at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. $CAR_{i,t}$ represents the cumulative abnormal stock returns of firm i in year t. This equals the cumulative monthly stock return of firm i minus the two-digit SIC industry median cumulative monthly stock return of firm i. $CEOtenure_{i,t}$, represents the tenure of the CEO of firm i in year t. $CPS_{i,t}$ represents the CEO Pay Slice of firm i in year t, which is the proportion of CEO

compensation to the aggregate compensation of the top-five paid executives. $CEOturnover_{i,t}$ *is a dummy variable representing forced turnover of the CEO of firm i in year t.*

Panel A	CEO Tenure		CPS		CEO Turnover	
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PO_{i,t}}$	88.12	226.85***	5.15**	1.45	-11.44**	-12.85**
	(113.00)	(88.03)	(2.15)	(2.26)	(5.56)	(6.04)
$CAR_{i,t}$	-	-	-	-	-9.82e^{-3}	-9.05e^{-3}
					(9.28e^{-3})	(9.27e^{-3})
$Rank_{i,t}^{May}$	-8.44e^{-4}	-3.40e^{-3}	-4.68e^{-5}	3.44e^{-5}	7.19e^{-5}	9.01e^{-5}
	(3.27e^{-3})	(2.30e^{-3})	(6.22e^{-5})	(5.99e^{-5})	(1.61e^{-4})	(1.68e^{-4})
$Ln(MktCap_{i,t})$	342.77	-54.54	3.24	-0.23	11.67	13.39
	(353.31)	(242.13)	(6.71)	(6.29)	(17.38)	(17.77)
$Ln(MktCap_{i,t})^2$	-15.79	1.54	-0.16	0.011	-0.49	-0.56
	(15.61)	(10.72)	(0.30)	(0.28)	(0.77)	(0.79)
$Ln(MktCap_{i,t})^3$	0.24	-9.91e^{-3}	2.48e^{-3}	-1.54e^{-4}	6.72e^{-3}	7.76e^{-3}
	(0.23)	(0.16)	(4.37e^{-3})	(4.11e^{-3})	(0.011)	(0.012)
R&D	4.32e^{-5}	-2.82e^{-4}	1.04e^{-6}	-5.51e^{-6}	-2.47e^{-5} *	-3.03e^{-5} *
	(2.98e^{-4})	(3.72e^{-4})	(5.65e^{-6})	(7.64e^{-6})	(1.47e^{-5})	(1.69e^{-5})
Firm Age	-0.015***	1.95e^{-3}	-7.28e^{-5}	-2.60e^{-4} ***	6.92e^{-4} ***	7.49e^{-4} ***
	(2.41e^{-3})	(2.10e^{-3})	(4.57e^{-5})	(5.24e^{-5})	(1.18e^{-4})	(1.33e^{-4})
Firm Size	-0.62***	-0.45***	-4.97e^{-3} **	-3.12e^{-3}	-3.04e^{-3}	-4.51e^{-3}
	(0.12)	(0.15)	(2.22e^{-3})	(3.10e^{-3})	(5.73e^{-3})	(6.75e^{-3})
Capex	-2.58e^{-4} **	-5.97e^{-4} ***	3.08e^{-6}	1.41e^{-7}	-6.77e^{-8}	2.92e^{-6}
	(1.21e^{-4})	(1.36e^{-4})	(2.29e^{-6})	(3.10e^{-6})	(5.94e^{-6})	(7.01e^{-6})
Cashflow	7.98e^{-5}	1.39e^{-4} **	1.32e^{-6}	1.90e^{-6}	-1.14e^{-5} ***	-1.10e^{-5}
	(7.51e^{-5})	(5.75e^{-5})	(1.43e^{-6})	(1.38e^{-6})	(3.70e^{-6})	(3.75e^{-6})
Tobin's Q	0.24***	0.095	-6.39e^{-3} ***	-2.21e^{-3}	-6.06e^{-3}	-6.50e^{-3}
	(0.074)	(0.065)	(1.41e^{-3})	(1.58e^{-3})	(3.70e^{-3})	(4.04e^{-3})
CEO Age	0.44***	0.49***	3.17e^{-4}	4.18e^{-5}	-8.94e^{-3} ***	-9.76e^{-3} ***
	(0.011)	(9.31e^{-3})	(2.09e^{-4})	(2.32e^{-4})	(5.42e^{-4})	(5.94e^{-4})
CEO Gender	2.30***	2.05***	5.02e^{-3}	0.026**	-0.071***	-0.066**
	(0.52)	(0.43)	(9.83e^{-3})	(0.011)	(0.025)	(0.028)
Constant	-2,488.08	542.23	-21.97	1.66	-91.99	-105.45
	(2,669.48)	(1826.43)	(50.71)	(47.42)	(131.30)	(134.15)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Observations	6,887	6,887	6,887	6,887	6,887	6,887
R^2	0.21	0.19	0.03	0.02	0.05	0.05

Results on the estimates of passive ownership on CEO tenure are visible in the first two columns of Table 11. The previous findings that used a bandwidth of 200 (Table 3) found no significant results within any model specification. Column 2 of Table 12 shows a coefficient that is economically

significant and statistically significant at the 1% level. Table 2 concluded that passive ownership increases with 1.47% for firms in the Russell 2000 using a bandwidth of 400. The coefficient of 226.85 in Table 11 Column (2) indicates an increase of CEO tenure by 3.33 years if a firm is assigned to the Russell 2000 instead of the Russell 1000 due to the increase in passive ownership. All things considered, Table 11 indicates that the previously found results are most likely not due to a weak instrument and that the true effect (or at least part of the true effect) of passive ownership on managerial entrenchment is being estimated.

5.3.3 Exclusion of years with few blockholder observations

One of the issues that arises in the analysis of passive blockholders, is that a very limited amount of corporation contains this type of blockholder. For example, yearly firm observation that contain at least one passive blockholder using the 5% ownership threshold range from 1 – 146. This is partly due to limitations of the dataset, but it is also partly due to the large dataset used. Because passive investment has only been popularized in the last decades, blockholders of such type has become more present in the last decade of the dataset. Figure 1 shows a graphical illustration of this phenomenon. The x-axis shows the years used in the dataset, whilst the y-axis shows the number of firms with at least one observed passive blockholder using the corresponding threshold for ownership. In all three different thresholds for passive blockholders the general trend seems to be upwards.

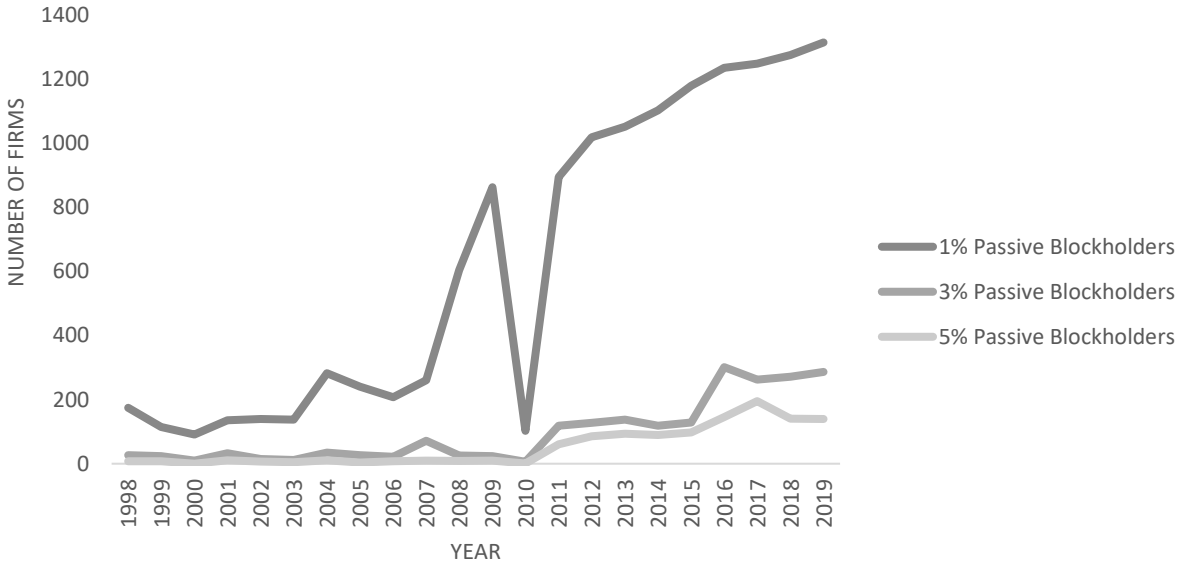

Figure 1: This figure shows the total firms per year in which the observed firm contains at least one passive blockholder, using different ownership threshold for the definition of a blockholder. The entire

dataset contains all firms from the Russell 1000 and Russell 2000, implying 3000 firms per year. The y-axis shows the number of firms that contain at least one passive blockholder, whilst the x-axis shows the year in which the firms were observed.

Figure 1 shows indications that the inclusion of years with limited observations might influence the empirical conclusions about passive blockholders, as there were different ownership structures at that time. Removing these years might result in different conclusions on the effect of passive blockholders. Intuitively, this also makes sense as managers might not have realized the presence of this type of blockholder until they became more popular. In order to account for this, the sample period in this section will be restricted to the years 2011 – 2019. This timeframe also allows us to remove the influence of crisis years, which seems to affect passive blockholders too. There was a massive drop in firms with passive blockholders in 2010, which could have been the result of the financial crisis of 2008. The effect of a crisis on passive blockholders has not been studied previously, so removing crisis years from the sample would only benefit the estimations of the true effect.

Table 6 has been replicated in Appendix F, this time only using observations between the years 2011 and 2019. The adaptation has resulted in no remaining significant coefficients when looking at passive blockholders with a threshold of 1% ownership. This loss is compensated by significant findings for passive blockholders that own at least 3% of the company, as both column 3 and column 4 of panel B are significant. The results indicate that passive blockholder ownership with a threshold of 3% reduces by 1.04% to 1.34% when a firm is assigned to the Russell 2000 instead of the Russell 1000. Columns 3 and 4 of panel A are also significant, indicating that a Russell 2000 assignment reduces passive blockholder ownership with a threshold of 5% by 1.01% to 1.43%. The rest of this section will use a bandwidth of 400 on both the 3% and 5% ownership thresholds for the empirical analysis. Instrument testing results in F-statistics of 6.03 and 3.04 for 3% and 5% ownership thresholds, respectively. This implies that both instruments show some strength in their explanatory power. On top of that, the F-statistic for 5% ownership blockholders has increased.

The results of the two-stage IV regression of passive blockholder ownership on managerial entrenchment in the years 2011 – 2019 can be found in Appendix G. Panel A reports the estimates using an ownership threshold of 3% for passive blockholder, whilst Panel B requires passive investors to own at least 5% of the total shares to be classified as a passive blockholder. Although only the coefficients in column (4) are significant, some conclusions can still be derived from this Table. Important to note is that all signs for passive blockholder ownership are the opposite sign of the respective coefficients when looking at passive ownership. Even though most of the Table is

insignificant, the results support the idea that passive blockholders have a negative effect on managerial entrenchment through their implicit voting behavior.

6 Conclusions

This paper investigates the effect of both passive investors and passive blockholders on managerial entrenchment using exogenous shocks in ownership structure caused by Russell index assignments. Managerial entrenchment has been tested with three determinants, CEO tenure, the CEO Pay Slice (CPS) and forced CEO turnover. First, the effect of passive ownership was examined. Using a two-stage fuzzy discontinuity design, the results indicate that assignment to the Russell 2000 instead of the Russell 1000 caused a significant increase in passive institutional ownership of 1.37 to 3.48 percent points. Using two-stage IV analysis, passive ownership did not show any significant relations with CEO tenure. These results are robust to both the addition of year fixed effects and to clustering the standard errors at either the firm or industry level. Passive ownership did show significant effects on CPS, as CPS increased by around 6.37% to 6.42% per percent increase in passive ownership. These results are statistically significant at the 1% level. A significant relation has also been found between CEO turnover and passive ownership, as CEO turnover decreases by 12.62 to 15.23 percent points for every percent point increase in passive ownership.

The same two-stage IV methodology is used to test the effect of passive blockholder ownership on managerial entrenchment. Two different ownership thresholds (1% and 5% ownership) have been used for the definition of blockholder. Assignment to the Russell 2000 index instead of the Russell 1000 index results in an increase of 1% passive blockholder ownership by 0.71 to 1.50 percent points, whilst ownership of 5% passive blockholders drops by 0.30 to 0.48 percent points. The analysis on managerial entrenchment determinants indicates that 1% passive blockholder ownership has a positive effect on both CEO tenure and CPS, and a negative effect on forced CEO turnover. These results are both statistically and economically significant. A one percent point increase in 1% passive blockholder ownership corresponds to an increase in CEO tenure of 1.93 years, a 4.38% to 4.48% increase in CPS and a 9.31% to 10.92% decrease in forced CEO turnover. On the other hand, a one percent increase in 5% blockholder ownership corresponds to an economically insignificant decrease in CEO tenure, a 29.51% to 30.14% decrease in CPS and a 64.43% to 73.55% increase in forced CEO turnover.

The strength of these findings has also been examined using robustness checks. The instrument of Russell index assignments showed signals of being somewhat weak in the passive ownership analysis, but the findings are robust to using a stronger instrument through a higher bandwidth. Passive

blockholder ownership was minimally represented in earlier years of the dataset. Removal of these years indicate that the findings of 1% passive blockholder ownership are not robust to this adaptation, but the results on 5% passive blockholder ownership are still significant. On top of that, the strength of the instrument for the latter increased. The results of this paper indicate that passive ownership has a significantly positive effect on managerial entrenchment, whilst 5% passive blockholder ownership reduces managerial entrenchment. These findings support the results of Appel et al. (2016a), as they concluded that passive blockholders govern through voting using low-cost general principles that do not require individual firm analysis. On top of that, these findings indicate that passive investors, by nature, have a negative effect on managerial entrenchment. However, this effect appears to switch as the size of this type of investor grows. This could be an explanation for the opposite views that are currently present in this field of study.

The change of passive funds in both incentives and voting behavior should be examined further, as index funds continue to rise in popularity. The findings in this paper showcase that the rise of this type of blockholder could benefit corporate governance, as one large passive blockholder seems to be better than a similar block with dispersed passive ownership. However, it is also not certain what the alternative to this passive blockholder would be. As Corum et al. (2021) states, passive funds appear to improve corporate governance only if they crowd out private savings. But when passive funds crowd out active funds, corporate governance seems to decrease. Future research could determine where the funds of passive blockholders stem from, as this could aid in finding the true effect of this ownership.

Other topics for future research include the possible prolonged effects of passive blockholders on managerial entrenchment. Managers might not instantly determine the level of passive ownership for each year. It seems more likely that the CEO would notice over time, through board meeting attendance or voting habits, that there is a relatively large share of passive ownership. On top of that, managers might purposely wait in between different entrenchment policies as active shareholders might become more aware of the selfish incentives behind these changes. If this is the case, then the entrenchment effect should be determined based on lagged ownership structures.

Future research could also investigate whether the same results will be found if the presence of passive blockholders is analyzed instead of the total ownership of passive blockholders. This is based on the findings of Appel et al. (2016b), as they conclude that activists act on the predictable voting behavior of index funds. This could imply that the presence of one passive blockholder is enough to incentivize activists and thus to minimize managerial entrenchment. This could imply that the effect is ordinal (binary) instead of nominal. The results found in this paper support the theory that passive

blockholders remove some degree of managerial entrenchment through generally applicable low-cost voting behavior. Nonetheless, more research is required in order to completely understand the effect of passive blockholders on corporate governance.

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8 Appendix

Appendix A

Literature list of all available papers (to my knowledge) that examine the effect of either passive investors or passive blockholders on managerial entrenchment. Index funds or quasi-indexers are in this case seen as passive blockholders.

Appel, Gormley and Keim (2016a) *Journal of Financial Economics*	Using a two-stage IV approach, the authors conclude that passive mutual funds have a significant impact on three aspects of corporate governance. An increase in passive ownership is associated with an increase in board independence, removal of takeover defenses and a higher likelihood of containing a dual class share structure.
Appel, Gormley and Keim (2016b) *The Review of Financial Studies*	This paper follows the same methodology as Appel et al. (2016) in order to establish the effect of passive mutual funds on firm activism. They find that passive ownership has a significant effect on activists' campaign goals. Firms with high levels of passive ownership have a higher likelihood of campaigns seeking board representation, along with an increase in hostile tactics to achieve the campaign goals. On top of that, they find that passive ownership increases activists' success rates of campaigns with goals that pertain to long-term views.
Barzuza, Curtis and Webber (2019) *Southern California Law Review*	In this paper, the authors oppose the view that index fund managers show passivity in every dimension of corporate governance. They document that index fund managers have a leading role in opposing management on board diversity and corporate sustainability through engagement in ESG policies. The authors state that this engagement follows from the threat of millennial migration, as this generation puts less emphasis on returns and focuses more on hyperopic behavior.
Bebchuk, Cohen and Hirst (2017) *Journal of Economic Perspectives*	The authors introduce a theoretical economic model to explain incentive differences in agency cost spendings, which is lower for index funds than for actively managed funds. Whilst they acknowledge the desirability of the largest index funds to improve corporate governance, they explain through economic analysis that their low incentive levels will cause behavior in fund stewardship that is less than optimal for their investors.
Bebchuk and Hirst (2019) *Columbia Law Review*	This Working Paper examines the stewardship decisions of index fund managers. It introduces an analytical framework that identifies two incentives that largely affect stewardship decisions; incentives to underinvest in stewardship and incentives to defer to the preferences of the firm's manager. On top of that, the authors used an empirical analysis to showcase the practicality of their incentives' framework.

Chen, Huang, Li and Shevlin (2019) *Journal of Accounting and Economics*	The authors do not examine passive investors, but rather look specifically at quasi-indexers. This is a type of investors who "hold highly diversified portfolios that are likely to closely mimic an index". They conclude that higher levels of quasi-indexers result in improvements of the tax-saving effect through increasing overall firm performance and by affecting CEO equity incentives and corporate governance.
Chung, Cho, Ryu and Ryu (2019) *Review of Financial Economics*	This paper uses data on Schedule 13G filings from 2001 through 2012 to show that both the number of passive blockholders and the aggregate passive blockholder ownership increases firm value through an increase in the informational efficiency of prices.
Corum, Malenko and Malenko (2021) *SSRN*	The authors estimate an economical (theoretical) model in which market participants can allocate wealth to passive funds, active funds or private savings. They conclude that higher levels of private funds improve corporate governance if it crowds out private savings, whilst corporate governance worsens if private funds crowd out active funds.
Fu, Pan and Wu (2021) *International Review of Economics & Finance*	The authors use a dataset of Chinese firms from 2007 through 2017 to examine the effect of index fund ownership on corporate governance. They find that an increase in index fund ownership corresponds to a reduction in turnover rates of both the stock and the managers, whilst simultaneously stabilizing shareholder structure. Their findings indicate that index fund ownership is associated with higher levels of innovation and a reduction of the managers' short-termism.
Glossner (2020) *SSRN*	The paper discusses different empirical approaches to the Russell index reconstitutions and Glossner finds a two-percentage point increase in passive ownership, which is partially due to a 0.6 through 0.9 percentage point increase in passive mutual fund ownership. This increase of passive ownership does not appear to have a significant effect on corporate social responsibility.
Heath, Macciocchi, Michaely and Ringgenberg (2022) *The Review of Financial Studies*	Using a difference-in-difference design with fixed effects on Russell index reconstitutions after 2006, the authors conclude that index funds are more likely to vote with management on contentious votes than actively managed funds. Specifically, they are 11.3% more likely to vote with management on compensation policies and less likely to vote against managerial entrenchment votes (e.g., removal of poison pills and golden parachutes). Their results imply that index funds with low resource levels tend to invest less in monitoring and therefore cede power to the firm's management.
Kahan and Rock (2020) *Boston University Law Review*	This paper provides an analysis on the incentive structure of index fund advisors. Due to both the scale and scope of index funds, they are financially incentivized to be well-informed. The scale of these funds increases the importance of voting behavior that increases

	firm value, whilst the scope allows index funds to incorporate spillover effects as knowledge about one firm can be implemented in a subset of their wide range of investees. Overall, the authors conclude that index funds generally improve corporate governance as they specialize in different governance areas then actively managed funds.
Qin, and Wang (2018) *SSRN*	Using a large sample of index funds and ETF ownership from 2001 to 2015, the authors conclude that an increase in passive ownership is associated with lower firm value and weaker operating performance. These effects persist even after two years.
Schmidt and Fahlenbrach (2017) *Journal of Financial Economics*	The authors use Russell reconstitutions in a sample period of 1993 to 2010 to find evidence that higher levels of passive ownership increase the power of the CEO, and that this increase in CEO power is value-decreasing. An increase in passive ownership results in a higher likelihood for the CEO to also become chairman or president, a decrease in independent board turnover and lower cumulative announcement returns in mergers and acquisitions.
Strampelli (2018) *San Diego Law Review*	The author set out the current EU corporate governance regulation against the increasing interest in passive investing and advocate for a shift in focus from short-termism regulation to cost-minimizing regulation in order to promote shareholder engagement of both active and passive institutional investors.

Appendix B

This table reports the coefficients of the Pearson's correlation matrix using passive ownership and several firm characteristics.

	Correlations with Firm Characteristics							
	PO	Capital	Capex	R&D	Firm Age	Firm Size	Cashflow	Tobin's Q
PO	1.0000							
Capital	0.0102	1.0000						
Capex	0.0015	0.8402	1.0000					
R&D	0.0027	0.1954	0.3377	1.0000				
Firm Age	0.1535	0.1278	0.1159	0.0435	1.0000			
Firm Size	0.1267	0.4159	0.4670	0.2488	0.3313	1.0000		
Cashflow	0.0180	0.5277	0.5118	0.4079	0.1419	0.4432	1.0000	
Tobin's Q	-0.0378	-0.0997	-0.0825	0.0932	-0.1613	-0.3405	0.0171	1.0000

Appendix C

Variable descriptions

Variables	Description (source)
Firm Size	Firm size is measured as the natural logarithm of total assets at the beginning of the year and cash flow equals the depreciation plus earnings before extraordinary items. (Compustat)
Firm Age	Firm age is determined as the first available year in Compustat that contains observations of that firm. (Compustat)
Capital	Capital is equal to the total of property, plant and equipment. (Compustat)
CAPEX	Capital Expenditures equals the total investments of the firm. (Compustat)
Cashflow	Cashflow is determined by adding depreciation to the earnings before extraordinary items. (Compustat)
Tobin's Q	Tobin's Q equals the market value of assets divided by the book value of assets. The market value of assets is defined as the total assets plus the market value of equity minus the book value of equity. The market value of equity is determined by the product of the common shares outstanding and the fiscal year closing price. The book value of equity equals the stockholders' equity minus preferred stock liquidating value plus balance sheet deferred taxes and investment tax credit minus post retirement assets. The book value of assets equals total assets. (Compustat)
R&D	R&D expenses are determined using the XRD data. If the dummy variable R&D missing equals 1, R&D is set to 0. (Compustat)
R&D Missing	A dummy variable for missing R&D values, which equals 1 if XRD is missing and else 0. (Compustat)
Total MktCap	End-of-May total market capitalization (in $million), used to establish Russell rankings. It is calculated by multiplying stock prices from CRSP with shares outstanding from CompuStat. (CRSP/Compustat)
Float-adjusted MktCap	The float-adjusted market capitalization in June (in $million) is determined through the adjustment factors from CompuStat Monthly and if unavailable, the adjustment factor of the closest quarter using CompuStat quarterly. Specifically, the float-adjusted June market capitalization equals the total market capitalization in June minus the market capitalization of non-tradable shares.
CAR	Cumulative Abnormal Stock Returns (CAR) is calculated by subtracting the CAR median value at the two-digit standard industrial classification level from the annual stock returns of the firm. Annual stock returns are calculated as the cumulative monthly stock returns. (CRSP)
Institutional Ownership	Total institutional ownership equals the percentage of outstanding shares held by institutional investors in September, two months after the Russell reconstitution. Thomson Reuters s12 mutual fund database is used to calculate the proportion of passive institutional investors to total institutional investors. If there was no observation of institutional ownership from Thomson Reuters Spectrum 13f, then total institutional ownership was retrieved from Thomson Reuters s12 by adding total passive ownership with total active ownership.
Active Ownership	All institutional ownership

Passive Ownership	Passive institutional investors are determined based on the methodology of Appel et al. (2016a, 2020). Specifically, a mutual fund is labelled as a passive fund if the name of the fund includes one of the following strings: Index, Idx, Indx, Ind_ (where_ indicates a space), Russell, S & P, S and P, S&P, SandP, SP, DOW, Dow, DJ, MSCI, Bloomberg, KBW, NASDAQ, NYSE, STOXX, FTSE, Wilshire, Morningstar, 100, 400, 500, 600, 900, 1000, 1500, 2000, 3000, and 5000. (Thomson Reuters)
Passive Blockholders (1%)	A dummy variable that equals 1 if the firm contains at least one passive blockholder with at least 1% ownership of the firm. (Thomson Reuters)
Passive Blockholders (3%)	A dummy variable that equals 1 if the firm contains at least one passive blockholder with at least 3% ownership of the firm. (Thomson Reuters)
Passive Blockholders (5%)	A dummy variable that equals 1 if the firm contains at least one passive blockholder with at least 5% ownership of the firm. (Thomson Reuters)
PB Ownership (1%)	Reports the proportion of total ownership of passive blockholders that pass the 1% threshold compared to total ownership, scaling from 0 to 1. (Thomson Reuters)
PB Ownership (3%)	Reports the proportion of total ownership of passive blockholders that pass the 3% threshold compared to total ownership, scaling from 0 to 1. (Thomson Reuters)
PB Ownership (5%)	Reports the proportion of total ownership of passive blockholders that pass the 5% threshold compared to total ownership, scaling from 0 to 1. (Thomson Reuters)
CEO Age	Variable that contains the age of the CEO in years. (ExecuComp/Capital IQ)
CEO Gender	A dummy variable that equals 1 if the CEO is male and 0 if the CEO is female. (ExecuComp/Capital IQ)
CEO Tenure	Calculated as the years since the CEO started his/her job as CEO at the company. (ExecuComp)
CEO Forced Turnover	A dummy variable that equals 1 if the CEO left the company in that year, and else 0. If the CEO is above 60 years old, the turnover is not included as this is most likely not a forced turnover. (ExecuComp)
CEO Pay Slice	The CEO Pay Slice (CPS) is the proportion of CEO total compensation to the aggregate compensation of the top-five paid executives, scaling from 0 to 1. (ExecuComp)

Appendix D

The Table below shows the historical Russell rank dates and reconstitution dates. It is based on Appendix A of Ben-David et al. (2019), which retrieved these dates from FTSE Russell. Prior to 1989, reconstitution did not take place annually. From 1989 to 2004, the reconstitution date was the last trading day of June. Russell revised the reconstitution date to the last Friday in June in 2004. Three years later, in 2007, reconstitution took place on the last Friday in June unless this Friday occurred on the 28th, 29th, or 30th as it would then take place on the previous Friday. In 2013, the ruling of 2007 was changed to only affect Fridays that occurred on the 29th or 30th of June.

Rank Date	Reconstitution Date
10/05/2019	28/06/2019
11/05/2018	22/06/2018
12/05/2017	23/06/2017
27/05/2016	24/06/2016
29/05/2015	26/06/2015
30/05/2014	27/06/2014
31/05/2013	28/06/2013
31/05/2012	22/06/2012
31/05/2011	24/06/2011
28/05/2010	25/06/2010
29/05/2009	26/06/2009
30/05/2008	27/06/2008
31/05/2007	22/06/2007
31/05/2006	30/06/2006
31/05/2005	24/06/2005
28/05/2004	25/06/2004
30/05/2003	30/06/2003
31/05/2002	28/06/2002
31/05/2001	29/06/2001
31/05/2000	30/06/2000
28/05/1999	30/06/1999
29/05/1998	30/06/1998

Appendix E

This table reports the second stage estimates of a fuzzy discontinuity regression of passive ownership on an indicator for Russell 2000 index assignment. In addition to the model used for Table 2, the banding procedure has been added to the model. The following design is being estimated:

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t}$$

$$PO_{i,t} = a_1 + \beta_4 Banding_t + \beta_5 \widehat{R2000}_{\iota,t} + \beta_6 Rank_{i,t}^{May} + \beta_7 \widehat{R2000}_{\iota,t} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t}$$

where $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $PredictR2000_{i,t}$ is a dummy variable that indicates whether $Rank_{i,t}^{May}$ predicts Russell 2000 membership, where $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May total market capitalization. $PO_{i,t}$ is the proportion of passive ownership to total ownership of firm i after the reconstitution in year t, on a scale from 0 to 1. $Banding_t$ is a dummy variable that equals 1 if the observed year is in 2007 or later, and else 0. v_t equals the year dummies, whilst $u_{i,t}$ and $\varepsilon_{i,t}$ represent the error term.

A.	Passive Ownership			
	(1)	(2)	(3)	(4)
Banding	0.039***	0.078***	0.095***	0.081***
	($1.19e^{-3}$)	($3.33e^{-3}$)	($3.64e^{-3}$)	($4.84e^{-3}$)
$\widehat{R2000}$	0.062***	0.035*	0.022*	0.032*
	(0.022)	(0.019)	(0.011)	(0.017)
May Rankings	$-2.00e^{-6}$	$2.12e^{-5}$	$1.34e^{-5}$	$1.83e^{-5}$
	($1.64e^{-5}$)	($1.45e^{-6}$)	($9.35e^{-6}$)	($1.25e^{-5}$)
Interaction Term	$-5.34e^{-5}$ **	$-3.31e^{-5}$ *	$-2.15e^{-5}$	$-3.05e^{-5}$ *
	($2.20e^{-5}$)	($1.94e^{-6}$)	($1.17e^{-5}$)	($1.75e^{-5}$)
Year FE	No	Yes	Yes	Yes
Firm FE	No	No	Yes	No
Industry FE	No	No	No	Yes
Observations	5,187	5,187	5,187	5,186
R^2	0.17	0.36	0.36	0.36

, ** and * indicate significance at the 10%, 5% and 1% level, respectively.*

Appendix F

This table reports estimates of a two-stage fuzzy discontinuity regression of passive blockholder ownership on an indicator for Russell 2000 index assignment using a timeframe of 2011 to 2019. Panel A, B and C report the estimates of total passive blockholder ownership using ownership thresholds of 5%, 3% and 1%, respectively. Specifically, the following two-stage fuzzy regression discontinuity design is being estimated:

$$R2000_{i,t} = \alpha_0 + \beta_1 PredictR2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \beta_3 PredictR2000_{i,t} Rank_{i,t}^{May} + v_t + u_{i,t}$$

$$\sum_{k=1}^{3} PB_{i,t}^{2k-1} = a_1 + \beta_4 \widehat{R2000}_{\iota,t} + \beta_5 Rank_{i,t}^{May} + \beta_6 \widehat{R2000}_{\iota,t} Rank_{i,t}^{May} + v_t + \varepsilon_{i,t}$$

where $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $PredictR2000_{i,t}$ is a dummy variable that indicates whether $Rank_{i,t}^{May}$ predicts Russell 2000 membership, where $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May total market capitalization. $\sum_{k=1}^{3} PB_{i,t}^{2k-1}$ is the proportion of passive blockholder ownership to total ownership of firm i after the reconstitution in year t, on a scale from 0 to 1. The three different dependent variables represent different ownership threshold for what constitutes a blockholder. This corresponds to thresholds of blockholders containing at least 1%, 3% or 5% ownership of the firm. v_t equals the year dummies, whilst $u_{i,t}$ and $\varepsilon_{i,t}$ represent the error terms.

Panel A	Passive blockholders (5%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{\iota,t}$	-4.10e^{-3}	-0.015	-0.014**	-0.010**
	(0.015)	(9.81e^{-3})	(6.15e^{-3})	(3.98e^{-3})
May Rankings	-3.01e^{-6}	-8.69e^{-6}	-7.25e^{-6} *	-6.54e^{-6} **
	(1.27e^{-5})	(8.05e^{-6})	(4.41e^{-6})	(3.04e^{-6})
Interaction Term	2.80e^{-6}	1.50e^{-5}	1.43e^{-5} **	1.04e^{-5} **
	(1.57e^{-5})	(1.03e^{-5})	(6.20e^{-6})	(4.02e^{-6})
Bandwidth	100	200	300	400
Observations	946	1,875	2,838	3,741
R^2	0.02	0.01	0.01	0.01

Panel B	Passive blockholders (3%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{\iota,t}$	4.18e^{-3}	-4.27e^{-3}	-0.013*	-0.010**
	(0.017)	(0.012)	(7.34e^{-3})	(4.47e^{-3})
May Rankings	4.68e^{-6}	-9.66e^{-7}	-7.62e^{-6}	-7.16e^{-6} **
	(1.49e^{-5})	(9.71e^{-6})	(5.43e^{-6})	(3.58e^{-6})
Interaction Term	-6.88e^{-6}	4.45e^{-6}	1.38e^{-5} *	1.10e^{-5} **
	(1.84e^{-5})	(1.25e^{-5})	(7.45e^{-6})	(4.72e^{-6})
Bandwidth	100	200	300	400

Observations	946	1,875	2,838	3,741
R^2	0.02	0.01	0.01	0.01

Panel C	Passive blockholders (1%)			
	(1)	(2)	(3)	(4)
$\widehat{R2000}_{i,t}$	$7.59e^{-3}$	0.034	$3.02e^{-3}$	0.014
	(0.038)	(0.027)	(0.016)	$(9.80e^{-3})$
May Rankings	$7.05e^{-7}$	$2.88e^{-5}$	$2.58e^{-5}$ **	$2.37e^{-5}$ ***
	$(3.23e^{-5})$	$(2.23e^{-5})$	$(1.20e^{-5})$	$(7.63e^{-6})$
Interaction Term	$-1.27e^{-5}$	$-3.32e^{-5}$	$-5.20e^{-6}$	$-1.41e^{-5}$
	$(4.02e^{-5})$	$(2.86e^{-5})$	$(1.61e^{-5})$	$(1.01e^{-5})$
Bandwidth	100	200	300	400
Observations	946	1,875	2,838	3,741
R^2	0.18	0.17	0.19	0.19

Appendix G

This table reports estimates of the second-stage regression of the instrumental variable estimation to identify the effect of passive blockholder ownership on CEO tenure, CPS and forced CEO turnover using a bandwidth of 400. The three two-stage equations are the same as in Tables 7,8 and 9, which implies the following (note that the first-stage equation is equal in all models):

$$PB_{i,t} = \alpha_0 + \beta_1 R2000_{i,t} + \beta_2 Rank_{i,t}^{May} + \sum_n \gamma_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + v_t + u_{i,t}$$

$$CEOtenure_{i,t} = a_1 + \beta_3 \widehat{PB_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$$CPS_{i,t} = a_1 + \beta_3 \widehat{PB_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + v_t + \varepsilon_{i,t}$$

$$CEOturnover_{i,t} = a_1 + \beta_3 \widehat{PB_{i,t}} + \beta_4 Rank_{i,t}^{May} + \sum_n l_n \left(Ln\left(MktCap_{i,t}\right)\right)^n + \sum \beta_j Control\ Variables_{i,t} + \beta_5 CAR_{i,t} + v_t + \varepsilon_{i,t}$$

where $PB_{i,t}$ is the proportion of passive ownership to total ownership of passive blockholders at the end of the first quarter of the reconstitution year t, on a scale from 0 to 1. Panel A uses a threshold of 3% ownership, whilst panel B uses a threshold of 5% ownership. $R2000_{i,t}$ is a dummy variable that equals 1 if firm i is in the Russell 2000 index and 0 if the firm is in the Russell 1000 index. $Ln\left(MktCap_{i,t}\right)$ equals the natural logarithm of firm i's end-of-May total market capitalization in year t and $Rank_{i,t}^{May}$ is the ranking of firm i in year t based on the end-of-May rankings. v_t equals the yearly fixed effects, whilst $u_{i,t}$ represents the error term. $CAR_{i,t}$ represents the cumulative abnormal stock returns of firm i in year t. This equals the cumulative monthly stock return of firm i minus the two-digit SIC industry median cumulative monthly stock return of firm i. $CEOtenure_{i,t}$, represents the tenure of the CEO of firm i in year t. $CPS_{i,t}$ represents the CEO Pay Slice of firm i in year t, which is the proportion of CEO compensation to the aggregate compensation of the top-five paid executives. $CEOturnover_{i,t}$ is a dummy variable representing forced turnover of the CEO of firm i in year t. (Table can be found on the next page)

Panel A	CEO Tenure		CPS		CEO Turnover	
3% Threshold	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PB_{i,t}}$	-152.01	-603.64	-6.36	-7.85*	15.96	15.94
	(241.14)	(405.93)	(4.42)	(4.31)	(11.93)	(10.86)
$CAR_{i,t}$	-	-	-	-	-0.067***	-0.067***
					(0.022)	(0.018)
$Rank_{i,t}^{May}$	0.013	0.019	15.34	2.10e^{-4}	-6.50e^{-4}	-6.70e^{-4}
	(8.59e^{-3})	(0.013)	(38.61)	(1.41e^{-4})	(4.25e^{-4})	(4.23e^{-4})
$Ln(MktCap_{i,t})$	-1709.78	-61.02*	15.34	-0.55	-40.28	2.22*
	(2104.54)	(36.23)	(38.61)	(0.46)	(103.97)	(1.20)
$Ln(MktCap_{i,t})^2$	74.94	4.58	-0.65	0.043	1.67	-0.17*
	(91.11)	(2.79)	(1.67)	(0.036)	(4.50)	(0.093)
$Ln(MktCap_{i,t})^3$	-1.09	-0.087	9.23e^{-3}	-8.28e^{-4}	-0.023	-4.71e^{-5} ***
	(1.31)	(0.054)	(0.024)	(7.25e^{-4})	(0.065)	(1.51e^{-5})
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Observations	2,592	2,592	2,592	2,592	2,592	2,592
R^2	0.24	0.24	0.01	0.01	0.06	0.06

Panel B	CEO Tenure		CPS		CEO Turnover	
5% Threshold	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{PB_{i,t}}$	-187.86	-744.35	-7.86	-9.72*	19.73	19.76
	(298.01)	(501.85)	(5.47)	(5.34)	(14.74)	(13.44)
$CAR_{i,t}$	-	-	-	-	-0.067***	-0.067***
					(0.022)	(0.018)
$Rank_{i,t}^{May}$	0.012	0.016	7.61e^{-5}	1.68e^{-4}	-5.64e^{-4}	-5.93e^{-4}
	(7.86e^{-3})	(0.011)	(1.44e^{-4})	(1.27e^{-4})	(3.89e^{-4})	(3.92e^{-4})
$Ln(MktCap_{i,t})$	-1720.36	-49.73*	14.90	-0.41	-39.17	1.92*
	(2104.68)	(29.98)	(38.61)	(0.41)	(103.98)	(1.10)
$Ln(MktCap_{i,t})^2$	75.30	3.69	-0.64	0.032	1.64	-0.14*
	(91.12)	(2.31)	(1.67)	(0.032)	(4.50)	(0.09)
$Ln(MktCap_{i,t})^3$	-1.09	-0.069	9.07e^{-3}	-6.06e^{-4}	-0.023	2.69e^{-3}
	(1.31)	(0.045)	(0.024)	(6.49e^{-4})	(0.065)	(1.68e^{-3})
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Observations	2,592	2,592	2,592	2,592	2,592	2,592
R^2	0.24	0.24	0.02	0.01	0.06	0.06