Big Three institutional ownership and ethnic diversity in U.S. boards

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Abstract

This study focuses on the relationship between ownership of the Big Three asset management firms – BlackRock, Vanguard, and State Street Global Advisors – and ethnic diversity in U.S. boards. It aims to investigate the influence that the Big Three exert to improve ethnic diversity in firms of which they own shares. The study does so by conducting regression analyses including year and firm fixed effects. Additionally, a Two-Stage Least Squares analysis is performed with top 500 Russell 2000 constituency as the Instrumental Variable, in order to account for exogenous variation in ownership. Only some of the fixed effects regression analyses show a positive relationship. On the other hand, the Two-Stage Least Squares analysis is highly limited and is therefore unreliable. Despite limited evidence, this paper does indicate a positive relationship between Big Three ownership and ethnic diversity in U.S. boards.

1. Introduction

As a result of globalisation and immigration, the demographic of the United States of America has become increasingly ethnically diverse. This societal change is accompanied by a struggle for cohesiveness in the country (Van der Meer & Tolsma, 2014; Cox, Lobel & McLeod, 1991). One way of viewing this is through leadership roles and who fulfils them. The inclusion of minority groups, who previously had more limited access, can expand the definition of these leadership roles (Eagly & Chin, 2010). However, leaders from minority backgrounds face many obstacles and prejudices during their climb to the top. Still, they seem to use the skills obtained during this struggle as a strength rather than a limit. Their increased performance orientation and self-determination enhances the quality of their leadership (Chin, 2013). Due to the enlarged attention for the hardships that minorities face, there has been a rise in concern for diversity, equity and inclusion (DEI). Currently, a majority of the S&P 500 have installed a chief diversity officer (Green, 2021). Although various states in the U.S. have implemented gender quotas, this is not as easily applicable with ethnicity. Quotas regarding ethnicity often benefit groups that were not that underrepresented in the first place and fail to help those that need it most (Bogan, Potemkina & Yonker, 2021). Therefore, the effort to increase board gender diversity must be supported differently and possibly with external help.

As of 2023 the Big Three: BlackRock, Vanguard and State Street Global Advisors were all part of the top 10 leading asset management firms by assets under management (Mitchell, 2023). Thus, these firms are highly influential and have the power to help make the necessary changes. The Big Three have already made headlines regarding their efforts to improve ethnic diversity. BlackRock has committed to push firms to increase ethnic diversity within their boards and workforces and to vote against directors that do not actively try to meet this goal (Kishan, 2020). Vanguard also vowed to motivate companies by making them consider untapped talent groups (Kerber, 2020). It was also previously found that the Big Three do adhere to their promises on improved gender diversity and carbon emissions (Gormley, Gupta, Matsa, Mortal & Yang, 2022; Azar, Duro, Kadach & Ormazabal, 2021). However, they fail in many cases to vote in favour of proposals on racial equity issues and it seems that the Big Three are stuck between progressives and conservatives (Stewart, 2023). This therefore raises the question of whether their public statements on improving ethnic diversity are truthful and enforced.

This paper aims at answering whether Big Three ownership is positively related to ethnic diversity in U.S. boards. I seek to answer this question by defining Big Three ownership as the share of a firm that is owned by the Big Three individually and combined. Furthermore, ethnic diversity is defined as the number of different ethnicities within a board. Additionally, a measure for ethnic diversity is used as a robustness check where it is defined as the share of the board that belongs to an ethnic minority. The relationship between these two is then assessed using various research methods. Initially, a regular regression analysis is used which is later expanded using fixed effects. This is repeated using the change in Big Three ownership based on the previous year as the independent variable. Merely a few of these analyses show a positive relationship. Finally, a Two-Stage Least Squares (2SLS) analysis is conducted with top 500 Russell 2000 constituency as the Instrumental Variable to account for exogenous variation in Big Three ownership. This analysis results in a negative relationship, however this finding is quite unreliable. The overall finding of this paper is therefore that there is a positive relationship between Big Three ownership and ethnic diversity in U.S. boards.

Despite the limited evidence presented in this paper, it has scientific implications nevertheless. Firstly, the limited scope of this paper may have caused issues that led to these results and it can inspire those with access to better means to investigate this relationship as well and come up with a more complete picture. Secondly, it contributes to the existing literature by creating a more thorough understanding of the Big Three. As Chung and Zhang (2011) find that institutional ownership is associated with higher quality of governance and Cornett, Marcus, Saunders and Tehranian (2007) find that it is positively related to firm performance. Moreover, Aghion, Van Reenen and Zingales (2013) discover a positive relationship between institutional ownership and innovation. Additionally, as mentioned earlier Gormley et al. (2022) find that the Big Three cause improved gender diversity in boards and Azar et al. (2021) find reduced carbon emissions associated with the Big Three. My results add to this picture of what the effects are of Big Three ownership and in what areas they exert their influence and in what way.

In addition to this, this paper has societal implications. As discussed in the previous paragraph, the influence of the Big Three becomes increasingly clear and we can assume that these companies hold great power in shaping our societies. Essentially, they oversee to what extent ethnic diversity is on the agenda in large companies and this affects the day-to-day lives of individuals. This is because representation and role models are highly important as they act as

an inspiration to people from minority backgrounds to pursue a more ambitious career path and help to achieve an improved income equality (Porter & Serra, 2020; Durlauf, 1996). This is an important step in advancing intergenerational mobility (Jerrim & Macmillan, 2015). As these implications are sensitive and meaningful, we need to ask ourselves whether they should be in the hands of those who mainly seek to maximise profits.

This thesis is structured as follows. The next section provides a deeper insight into the existing literature and this forms the basis for the general hypothesis and the sub-hypotheses. Section 3 thoroughly describes the data sources and the variables used in the analyses. Section 4 gives an in-depth explanation of the various statistical methods that are used throughout the thesis. Consequently, section 5 presents and interprets the outcomes and findings of the analyses. Then, section 6 discusses the results in relation to the existing literature and the hypotheses. This section also includes the various implications of this study as well as the limitations and recommendations for future research. Finally, the conclusion can be found in section 7.

2. Literature Review

2.1 The Big Three Institutional Investors

The Big Three – BlackRock, Vanguard and State Street Global Advisors – are amongst the largest institutions when it comes to passive investing. In the past decade, there has been a rise in passive ownership. Contrary to active owners that try to buy outperforming stocks, passive funds tend to replicate certain indices. Despite the name suggesting passivity, this is not necessarily the case. (Fichtner, Heemskerk & Garcia-Bernardo, 2017). Aggarwal, Erel, Ferreira and Matos (2011) find that institutional investment and firm-level governance are positively associated. Moreover, according to their results, companies with a higher level of institutional ownership have a higher likelihood of firing inadequately performing CEOs. According to Appel, Gormley and Keim (2016) there are various reasons for passive owners to influence firms' governance. Firstly, passive investors are not as free to divest and will therefore need to ensure high quality governance in the firms that they own. Furthermore, passive investors are still institutional investors that have the responsibility to act in favour of their shareholders. This includes voting proxies and managing funds. Lastly, Black (1991) argues that passive investors have an incentive to boost absolute rather than relative performance, and therefore to improve overall market performance. This is due to an increase in relative performance not necessarily implying an increase in absolute terms. Investors seek to maximise fund flows, which respond to absolute performance.

Over the last decades, passive index funds have experienced a large increase in market share meaning a decrease in popularity of actively managed funds. Especially after the global financial crisis, actively managed funds were unable to outperform benchmark indices making them unattractive. On the other hand, passive index funds are appealing because of their market concentration, especially for Exchange-Traded Funds (ETFs) (Fichtner, Heemskerk & Garcia-Bernardo, 2017). According to Ernst & Young (2015) the ETF industry will continue to grow between 15 and 30 percent. Additionally, the total flow of assets toward index ETFs was 60% larger than that of index mutual funds over the period from 2009 to 2018. Due to fixed operating costs, the ETF industry is subject to economies of scale. This means that when assets under management are larger, the advantage becomes greater. Furthermore, these larger ETFs have liquidity advantages that can lead to networking benefits. The Big Three are in an advantageous position as they own over 90% of the fifty largest ETFs (Bebchuk & Hirst, 2019a). Moreover, these authors find that around 25% of all S&P 500 companies' shares are voted by the Big

Three and that this will increase to 40% in the next two decades. Therefore, it is argued that the Big Three will soon grow into the so-called 'Giant Three' (Bebchuk & Hirst, 2019b).

The enormous power that the Big Three possess seems to elude the public eye, whereas it is already starting to take on a more public role (Fichtner, 2020; Fichtner & Heemskerk, 2017). According to Fichtner and Heemskerk, the increase of passive asset management may have negative effects on economic equality and growth. Fichtner argues that, within the United States, the Big Three take on a public and utility-like stance. Also, they hold the power to put a halt on and possibly reverse financialisation of listed firms. Furthermore, it is claimed that the Big Three's large power restrains competition and institutional investment will be controlled by a small number of large firms. This will lead to these firms being even more capable of exerting large influence in various industries (Posner, Scott Morgan & Weyl, 2016).

2.2 The Importance of Ethnic Diversity

As especially western societies have been subject to large flows of immigration, they have become much more ethnically diverse (Van der Meer & Tolsma, 2014). This diversity, however, seems to be lacking in leadership positions as minorities face many struggles in making their way to the top (Chin, 2013). This is unfortunate, as representation matters for these minorities as they can act as role models and inspire others from their minority group (Porter & Serra, 2020). Banducci, Donovan and Karp (2004) find that enhanced minority representation in politics increases the political participation of those minorities. Representation can therefore help overcome income inequalities that these groups may be facing and improve their intergenerational mobility (Durlauf, 1996; Jerrim & Macmillan, 2015). Intergenerational mobility refers to the changes in status over generations within a particular family. The focus often lies in escaping poverty and how this is a larger issue in areas with higher inequality (Chetty, Hendren, Kline & Saez, 2014). However, Dinesen, Schaeffer and Sønderskov (2020) find a negative relationship between ethnic diversity and social trust and that this effect is mitigated by segregation. This segregation acts as a barrier to contact between different ethnic groups which creates distrust (Uslaner, 2012). Moreover, Montalvo and Reynal-Querol (2005) find that social polarisation hampers economic growth due to reduced investment and higher incidence of civil conflict. The authors also find that within countries with high ethnic heterogeneity, social fractionalisation is not or even negatively correlated with such polarisation. Putnam (2007) dives deeper into this concept and argues that increased diversity may not be as beneficial in the short run, but will show its advantages on

the longer horizon. He finds that diversity temporarily hinders the sense of community within a society and this creates a trade-off between community and diversity. Only the right policies, whether they be private or public, can alleviate that trade-off. One of the points he addresses, is that the key short run costs of diversity includes fragile communities with higher health and educational costs. On the other hand, this is met with nation-wide long run advantages such as scientific creativity. This is emphasised by Mcleod, Lobel and Cox (1996) who find that diverse work teams tend to come up with more creative solutions. To achieve these benefits he mentions that shared identities need to be strengthened through more opportunities for true interaction across all ethnicities. This interaction can be any place where people work, recreate, learn, and live (Putnam, 2007).

In the last decades, large corporations have also taken note to this shift in ethnic diversity and Diversity, Equity and Inclusion (DEI) has therefore become increasingly important in the corporate world (Daniels, 2001). Here, diversity refers to the representation of socio-cultural differences within an organisation. Equity entails that people must be treated fairly in their opportunities and outcomes, regardless of their backgrounds. Finally, inclusion means that the workplace creates an atmosphere where diverse groups are incorporated. Additionally, this means that marginalisation and exclusion should be actively avoided (Arsel, Crockett & Scott, 2022). According to research by WorldatWork (2021), 83% of U.S. employers have DEI initiatives. Also, a majority of the S&P 500 have installed a chief diversity officer (Green, 2021). These initiatives are aimed at hiring and retaining minority groups as well as making these groups feel included in their day-to-day life at work (Dover, Kaiser & Major, 2020). This is endorsed by a majority of employees within the companies taking these initiatives (WorldatWork, 2021).

Marimuthu and Kolandaisamy (2009) find that demographic diversity is positively associated with firms' financial and organisational performance. A report by McKinsey & Company also reveals a positive relationship between diverse leadership and improved financial performance. Their research reveals that firms within the top quartile of ethnic diversity were 35% more likely to outperform the industry mean. In the U.S. ethnic diversity seems to have a larger impact than gender diversity, which is likely due to earlier efforts promoting gender diversity having already had its positive effects (Hunt, Layton & Prince, 2015). Carter, D'Souza, Simkins and Simpson (2007) find that ethnic diversity is positively associated with financial performance through director nomination, audit and executive compensation. Consequently, they find that such diversity creates value for shareholders. However, others are sceptical when

it comes to the effects of diversity on financial performance. Van der Walt and Ingley (2003) conclude that a board should primarily be selected on merit. They argue that such a board becomes even more ideal when it accurately represents society in areas like gender, ethnicity and experience. This diversity should, however, not be of first-order importance. Additionally, Carter, D'Souza, Simkins and Simpson (2010) have investigated the effect of ethnic diversity on financial performance and had this time found neither a positive nor a negative relationship. Dover et al. (2020) find that DEI initiatives in firms can lead to feelings of exclusion amongst overrepresented groups. Moreover, such initiatives might suggest that minorities are inferior and require aid to succeed in their careers. These downsides may cancel out the benefits from DEI initiatives and can help explain the difficulty in finding a relationship between ethnic diversity and firms' financial performance. Even Carter et al. (2010) hypothesise that the reason for them not finding a relationship could be a result of negative and positive effects outweighing each other. The authors state that looking more closely at board diversity and its relationship with board behaviour can lead to clearer results. Hunt, Layton and Prince recommend key steps for making diversity programmes successful. Firstly, clear targets (instead of quotas) should be established and then the current situation should be accurately described in order to provide a base scenario. Consequently, initiatives should be differentiated by minority group, because the various groups may require different solutions. After that, strategies should be implemented through flagship programmes that are thoroughly monitored. Finally, the focus should be on maintaining an inclusive work environment through change management.

2.3 The Impact of the Big Three

The Big Three have made various statements regarding their views on diversity. BlackRock committed to push companies for larger ethnic diversity within boards and workforces and to vote against directors that do not act (Kishan, 2020). Furthermore, they want U.S. firms to aim for a 30% diverse board (Kerber & Dinapoli, 2021). BlackRock even wishes to share its own DEI initiatives with clients that are interested (BlackRock, 2023). Moreover, Vanguard pushed companies to do so by motivating them to look at untapped talent groups (Kerber, 2020). Additionally, State Street Global Advisors (SSGA) has stated that they wish to work with more diverse partners (Patterson, 2023).

Various studies have been conducted to try to verify these statements made by the Big Three. Firstly, Gormley et al. (2023) find promising results in their analysis on board gender diversity. Their results reveal that firms' appointment of female directors multiplied by 2.5 between 2016 and 2019 as a result of campaigns by the Big Three. Additionally, these campaigns resulted in an increase of 50% of board seats of public firms being held by women between 2016 and 2019. The authors further argue that such shareholder advocacy is preferable to government mandates. Where mandates may lead to tokenism, the campaigns made sure that the pool of female candidates was expanded, and the overall role of women was elevated within the board. Furthermore, Azar et al. (2020) investigate whether the Big Three act upon their commitments to decrease carbon emissions of firms in which they hold a stake. They find that higher ownership by the Big Three is associated with lower carbon emissions. Also, the Big Three tend to focus their engagements on large firms.

Ethnic diversity is a large theme within Socially Responsible Investment (SRI). SRI, in turn, is an important part of Environmental, Social and Governance (ESG) investing (Heath, Macciocchi, Michaely & Ringgenberg, 2021). The Big Three focusing on ESG investing does not only benefit their image, but also leads to higher stock return. Gibson, Krueger and Mitali (2020) find that institutional investors' portfolios' sustainability footprints are positively related to risk-adjusted performance. This is explained by additional price pressure on these stocks due to an increased demand for stocks with high scores on sustainability. Glossner (2021) investigates ESG incident recidivism and finds that companies with more ESG incidents tend to have weaker profitability and more future incidents. Also, they are associated with lower risk-adjusted stock returns. The author further argues that the market underreacts to these firms' past incidents due to insufficient investor attention which results in these negative abnormal returns at a later incident. This means that stocks will get overvalued which incentivises firms to continue to neglect ESG goals. This also implies that investors are better off monitoring firms more closely, or avoid companies with high incidence rates altogether.

The way in which the Big Three typically engage with firms to comply more with ESG is through communication and intervention. Communication is the most used tactic and involves discussions with top management and the board of directors apart from management. Intervention is more rigorous and includes shareholder proposals and voting (Brav, Malenko & Malenko, 2021). Lewellen and Lewellen (2022) find that the Big Three tend to have higher incentives to engage with firms than the average institution and that this is similar to the amount of incentives of active funds. Brav et al. discuss how such incentives include non-monetary

motives and how this leads to the Big Three advertising these incentives for marketing and branding purposes. The goal of this is to attract and retain investors from the millennial generation (Sharfman , 2023; Barzuza, Curtis & Webber, 2018). According to Sharfman, these millennials are an attractive group to the Big Three despite their relatively small size. They are expected to inherit the wealth of the baby boomers, who make up the majority of current investors. Brav et al. discuss that more research should be conducted on the role of environmental and social (E&S) issues in shareholder preferences as these topics can lead to a larger divide between shareholders than regular governance related issues.

2.4 The Role of the Russell 2000 Index

As stated before, passive investing largely includes replicating indices and this means that certain index constituency may influence a firm's ownership structure. Appel, Gormley and Keim (2020) argue that the Russell 2000 index is much more popular for ETFs and index funds than the Russell 1000. Russell 2000 constituents' proportion of total market capitalisation held by passive funds is on average 40% higher than that of similar Russell 1000 constituents (Appel, Gormley & Keim, 2019; Appel et al., 2016). Initially, the Russell 1000 consisted of the 1000 firms with the largest market capitalisations and the Russell 2000 of the next 2000. However, this resulted in lots of firms changing indices each year. Since 2007, Russell changed the way the indexes were constructed. Since then, stocks' index assignments are impacted by their ranks of the preceding year and cannot change index so easily. Overall, the firms at the top of the index are deemed as more attractive and are therefore weighted more heavily. Additionally, the Big Three tend to invest more in the Russell 2000. This means that firms at the bottom of the Russell 1000 that do not move to the Russell 2000 have a much lower level of Big Three ownership than if they were to move.

2.5 Hypothesis development

Whilst research has been done on the Big Three and its ESG impacts, it seems to be limited. Therefore, this thesis will provide more insights in this area. As discussed in the previous sub-sections, the Big Three hold a substantial amount of power and interest in influencing firms' governance choices (Bebchuk & Hirst, 2019a; Bebchuk & Hirst, 2019b; Appel et al., 2016). The Big Three have started to take on a more public stance as ESG has become a more important topic in society as well as in their future shareholders' preferences (Fichtner, 2020;

Gibson et al., 2020; Glossner, 2021; Sharfman, 2023). In particular, ethnic diversity is high on the agenda of large corporations as it has implications for the well-being of a society and leads to improved performance (Durlauf, 1996; Jerrim & Macmillan, 2015; Putnam, 2007; Hunt et al., 2015). The Big Three have therefore made various statements regarding their efforts to enhance ethnic diversity on boards in the U.S. (Kishan, 2020; Kerber & Dinapoli, 2021; Kerber, 2020; Patterson, 2023). Previous papers have already found that the Big Three tend to keep their word on such statements. Gormley et al. (2022) find that the Big Three improve gender diversity on boards and Azar et al. (2021) conclude that the Big Three reduce carbon emissions through engagements with firms in which they hold a large share. Based on this existing literature, the main hypothesis of this thesis is as follows:

General hypothesis: Big Three ownership is positively related to ethnic diversity in U.S. boards.

To thoroughly analyse this hypothesis, it will be split into sub-hypotheses which are discussed in the remainder of this section. The first two hypotheses investigate the relationship between the share that the Big Three holds and the ethnic diversity of the board measured in two ways:

Hypothesis 1: The combined and individual shares of the Big are positively related to the number of different ethnic backgrounds represented on a board.

Hypothesis 2: The combined and individual shares of the Big Three are positively related to the share of minorities on a board.

The previous hypotheses merely test the relationship between the magnitude of the share and the extent of ethnic diversity. However, investigating the change in ownership and ethnic diversity gives more insight into how big of a difference the Big Three actually make. Moreover, this serves as a robustness check on the first two hypotheses. Azar et al. (2021) incorporate this type of analysis into their paper as well and find that it supports their overall hypothesis.

Hypothesis 3: The percentual change in Big Three share is positively related to the number of different ethnic backgrounds represented on a board.

Hypothesis 4: The percentual change in Big Three share is positively related to the share of minorities on a board.

Finally, the last hypothesis covers the 2SLS analysis that will be conducted. According to Appel et al. (2020) Russell 2000 constituency causes exogenous variation in Big Three ownership of firms. Using the same reasoning as for the previous hypotheses, I expect that the relationship will still be positive when accounting for such exogenous variation:

Hypothesis 5: Big Three ownership positively affects ethnic diversity in boards when accounting for exogenous variation in Big Three ownership through Russell 2000 constituency.

3. Data

In order to assess the previously mentioned hypotheses, I will use various databases available through Wharton Research Data Services (WRDS). The data obtained stretches from 2011 up to and including 2022. The observations are on a firm-year basis, meaning that firms have one observation per available year. For data on ethnic backgrounds, I used the Institutional Shareholder Services (ISS) – Directors US database. Ownership data was collected via Thomson/Refinitiv 13-F and Compustat – North America was used for firm characteristics. Finally, Bloomberg was used for Russell 1000 & 2000 constituency. After merging the datasets, 17,472 observations remain.

3.1 Measures

The following section describes how the variables from the different datasets are constructed and used. It also contains information on assumptions that were made in order to construct them.

3.1.1 Ethnic diversity measures

The ISS – Directors US database covers companies listed in the S&P 1500 and contains information on the directors of these firms, like age, gender, title and also ethnicity. The variable for ethnicity takes on nine different values:

- Caucasian/White
- Black/African American
- Indian/South Asian
- Asian (excluding Indian/South Asian)
- Hispanic/Latin American
- Middle Eastern/North African
- Native American/Alaskan Native
- Native Hawaiian/Other Pacific Islander
- Other

These classifications seem too limited for them to be called different ethnicities and resemble the American social construct of race more. However, the concept of race is quite controversial

as it is viewed as a poor proxy for social, cultural and environmental factors that influence an individual (Winker, 2004). The term 'race' has also become a politically disputed concept and whilst ethnicity in its definition is a broader term than race, it is often still categorised into races (Blakemore, 2019). Therefore, I will continue with the terms 'ethnicity' and 'ethnic background' for the rest of this paper.

These classifications are then used to make two variables: ethnicity score and minority share. Ethnicity score is constructed by counting the number of different ethnicities that are in a firm's board in a particular year. Minority share is the share of minority directors in a firm's board in a particular year. I have defined minority as any classification except 'Caucasian/White', since this is the dominant ethnic background of the United States.

3.1.2 Ownership measures

Thomson/Refinitiv 13-F is a reliable source of institutional holdings, because it is based on the 13F form which needs to be filled out by money managers and investment companies on a quarterly basis. Following Ben-David, Franzoni, Moussawi and Sedunov (2021) I single out BlackRock holdings by using the MGRNO identifiers: 9385, 11386, 39539, 56790, 91430 and 12588. SSGA and Vanguard use 81540 and 90457 respectively. After obtaining all Big Three holdings, I divided the reported number of shares by the total number of shares outstanding to obtain the share percentage to create the variables BlackRock, Vanguard and SSGA. To create the Big3Share variable, I simply sum up the three individual shares.

Additionally, I construct the variable pchange which represents the percentual change in the Big Three share on a yearly basis. Then, a dummy variable called big3increase is formed that takes on value 1 if there was a meaningful increase in Big3Share compared to the previous year. A meaningful increase is defined as a rise of more than 1%.

3.1.3 Control variables

In order to strengthen the analysis, I add control variables on firm characteristics from Compustat – North America – Fundamentals Annual to reduce the chances of omitted variable bias. These variables include return on assets (ROA), leverage, market-to-book ratio (mbratio), property, plant and equipment (PPE), and size.

The ROA is created by dividing net income (NI) by total assets (AT). Leverage is computed by adding long-term debt (DLTT) and debt in current liabilities (DLC) and scaling this by total assets (AT). To construct the mbratio, I multiply the book value per share (BKVLPS) with common shares outstanding (CSHO) to obtain the total book value. Then, I divide market value (MKVALT) by book value and this is also scaled by total assets (AT). PPE is directly provided by the vendor (PPENT) and then scaled by total assets (AT) and size is created by taking the logarithm of total assets (AT).

3.1.4 Russell constituency

The Bloomberg terminal at the Erasmus University Rotterdam (EUR) and the Erasmus Data Service Centre (EDSC) provided the Russell constituents as well as their ranks. This was then used to create two dummy variables: Russell1000 and Russell2000. Russell1000 takes value 1 if the firm was included in the Russell 1000 in that year and value 0 if it was not. The same reasoning applies for Russell2000.

3.2 Descriptive statistics

Table 1 below shows the descriptive statistics of the above-mentioned variables.

Table 1: Descriptives

VARIABLES	N	mean	min	max
Big3Share	17,472	0.211	0	0.964
ethscore	17,472	1.971	1	6
ethshare	17,472	0.123	0	0.500
pchange	15,038	6.420	-89.48	450.51
size	16,067	8.441	3.762	15.14
ROA	14,514	0.050	-0.244	0.278
leverage	15,886	0.267	0	0.897
mbratio	14,077	0.136	-2.152	12.89
PPE	15,445	0.228	0	0.983

Notes: This table shows the descriptive statistics of the main variables used in the regression analyses.

The table shows that the Big Three share ranges from zero to almost the entire company being owned by the Big Three. The value of the mean suggests that there are not many firms in the sample that have such large Big Three shares. The Big3Share variable has already been winsorised due to outliers. The ethnicity score maximum has value 6, which means that no firm in the sample has a board with all eight options of ethnic backgrounds. The mean lies around two different ethnicities, meaning that having many different ethnicities in the board is quite exceptional. The minority share maximum of 0.5 indicates that, at most, half of the board comes from a minority background. The variable pchange has a mean of 6.420, meaning that there is overall more of an increase in Big Three share than a decrease. There seems to be a drop in observations which is due to the fact that the observations from 2011 do not have a previous firm-year observation in the sample. Also, some firms have missing years in between 2011 and 2022. The minimum change lies at -89.48 percent, in which case a large amount of the Big Three ownership is lost. The maximum value lies relatively higher at 450.51. There are many observations with high values for pchange, which can be explained by one or more of the Big Three suddenly buying lots of shares of a company. Still, this variable has been winsorised to

reduce noise. Finally, the control variables also have fewer observations, due to the merging process not yielding a 100% match. Some of the control variables showed severe outliers and therefore ROA, mbratio and leverage have been winsorised.

3.3 Covariates Balance

Table 2: Covariates Balance Summary

	Standardised differences		Variance ratio	
	Raw	Weighted	Raw	Weighted
size	-.0393623	.0078003	.6366032	.6930704
PPE	.0669527	-.0091693	1.204593	1.107332
mbratio	-.0440551	.0152134	1.377367	1.822402
leverage	.232637	-.0517164	1.28452	.589255
ROA	-.1326705	.0721901	.9486958	.3032178

Table 2 shows the covariates balance summary of the control variables and thus how similar the distribution of these covariates is across the levels of treatment. In order to do this, I have made a median split. This means that beneath the median classifies as untreated and above the median classifies as treated. The model seems to improve the level of balance for PPE. The weighted standardised difference is close to zero and the weighted variance ratio is relatively close to one. The other variables do not improve so well. Although the weighted standardised difference for size is close to zero, its weighted variance ratio is quite far from one. The same goes for the mbratio. Leverage and ROA also have weighted variance ratios that are considerably far from one and their standardised differences are not even that close to zero either.

4. Methodology

This section describes the methodology used to analyse the hypotheses as well as the equations used.

The following equation is used to test the first hypothesis: "*The combined and individual shares of the Big Three are positively related to the number of different ethnic backgrounds represented on a board.*"

Equation 1:

$$EthScore_{it} = \beta_0 + \beta_1 BlackRock_{it} + \beta_2 Vanguard_{it} + \beta_3 SSGA_{it} + \beta_4 Big3Share_{it} + \beta_5 size_{it} + \beta_6 ROA_{it} + \beta_7 mbratio_{it} + \beta_8 PPE_{it} + \beta_9 leverage_{it} + \tau_t + \delta_i + \varepsilon_{it}$$

Here, EthScore is the ethnicity score and is used as the dependent variable. BlackRock, Vanguard and SSGA are the individual shares of the Big Three. Big3Share is the combined value of these three individual shares. The τ and δ represent year and firm fixed effects respectively.

The second hypothesis is tested in a similar way: "*The combined and individual shares of the Big Three are positively related to the share of minorities on a board.*"

Equation 2:

$$MinShare_{it} = \beta_0 + \beta_1 BlackRock_{it} + \beta_2 Vanguard_{it} + \beta_3 SSGA_{it} + \beta_4 Big3Share_{it} + \beta_5 size_{it} + \beta_6 ROA_{it} + \beta_7 mbratio_{it} + \beta_8 PPE_{it} + \beta_9 leverage_{it} + \tau_t + \delta_i + \varepsilon_{it}$$

In this equation, MinShare is the minority share and is used as the dependent variable. The other variables are the same as in Equation 1.

For the third hypothesis: "*The percentual change in Big Three share is positively related to the number of different ethnic backgrounds represented on a board.*" I alter Equation 1.

Equation 3:

$$EthScore_{it} = \beta_0 + \beta_1 Big3increase_{it} + \beta_2 Big3increase_{it-1} + \beta_3 pchange_{it} + \beta_4 pchange_{it-1} + \beta_5 size_{it} + \beta_6 ROA_{it} + \beta_7 mbratio_{it} + \beta_8 PPE_{it} + \beta_9 leverage_{it} + \tau_t + \delta_i + \varepsilon_{it}$$

The dependent variable is now the change in ethnicity score and the independent variable is a dummy variable for a meaningful increase in Big Three share as explained in the Data section.

The fourth hypothesis states: *"The percentual change in Big Three share is positively related to the share of minorities on a board."* I will investigate this through the following equation.

Equation 4:

$$MinShare_{it} = \beta_0 + \beta_1 Big3increase_{it} + \beta_2 Big3increase_{it-1} + \beta_3 pchange_{it} + \beta_4 pchange_{it-1} + \beta_5 size_{it} + \beta_6 ROA_{it} + \beta_7 mbratio_{it} + \beta_8 PPE_{it} + \beta_9 leverage_{it} + \tau_t + \delta_i + \varepsilon_{it}$$

Additionally, I will strengthen this methodology by conducting a Two Stage Least Squares analysis as per the fifth hypothesis: "*Big Three ownership positively affects ethnic diversity in boards when accounting for exogenous variation in Big Three ownership through Russell 2000 constituency."* As mentioned in the Literature Review, Russell 2000 constituency may cause exogenous variation in Big Three ownership. The discussed discrepancy in popularity between the Russell 1000 and 2000 indices may create problems when investigating Big Three ownership. As of 2007, a stock's index assignment is largely dependent on its ranking in the previous year. Only if a stock's market capitalisation changes outside of a certain bandwidth will it change index. For example, if a stock has a market cap below that of the 1000th largest market cap it will naturally be included in the Russell 2000. However, if that particular stock was included in the Russell 1000 last year and the difference in market caps falls within 2.5% of the Russell 3000E Index's cumulative market cap, it will remain in the Russell 1000. According to Azar et al. (2021) this makes it complex to use the Russell 2000 as a source of exogenous variation in ownership. The authors explain that whenever an index is used as a benchmark for investment, a tiny share of that investment will go to the bottom stocks and a large share will go to the top stocks. This means that more money will be invested in the top Russell 2000 stocks than in the bottom Russell 1000 stocks. Since the banding policy limits stocks from moving between the two indexes and the Big Three invest more heavily in the Russell 2000 index, this policy impacts the exogenous variation in ownership caused by the Russell 2000 index (Chang, Hong & Liskovich, 2015; Wei & Young, 2000). Following this reasoning and the methodology proposed by Appel et al. (2020) the stages are:

First stage:

$$Big3Share_{it} = \alpha + \beta_1 Russell2000_{it} + \sum_{n=1}^{3}\beta_{n+1}(\ln(mktcap))^n + \beta_5 \ln(float) +$$
$$\beta_6 Russell2000_{it-1} + \delta_t + u_{it}$$

Second stage:

$$EthScore_{it} = \alpha + \beta_1 Big3Share_{it} + \sum_{n=1}^{3}\beta_{n+1}(\ln(mktcap))^n + \beta_5 \ln(float) +$$
$$\beta_6 Russell2000_{it-1} + \delta_t + u_{it}$$

The sample of this analysis is first limited to only firms in the bottom 500 of the Russell 1000 and the top 500 of the Russell 2000. Russell2000 is the instrumental variable and is a dummy that takes value 1 if the firm is in the Russell 2000 in a particular year.

The mktcap variable entails the market capitalisation that is used by Russell to rank firms and sort them into the Russell 1000/2000. However, this market cap is never published by Russell and seems to differ largely from the CRSP market cap. Appel et al. (2020) found a methodology that allows us to approximate the Russell market caps more accurately. This involves creating a dataset starting at 1998 and using the mean and standard deviation of the CRSP market caps of that year: mean = 7 and standard deviation = 1.3). Following a normal distribution with aforementioned mean and standard deviation, values for market cap are randomly drawn for each stock in each year. Then, these values are ranked where the top 1000 are assigned to the Russell 1000 index and the next 2000 are allocated to the Russell 2000 index.

The float variable captures the float-adjusted market cap used by Russell. After assigning the stocks to the Russell 1000/2000, the float adjusted market cap is used to rank stocks within the indexes themselves. This adjustment is made to add more weight to publicly traded stocks such that the index presents a more realistic investable universe (FTSE Russell, 1984). This variable is also not observable by the public and has to be constructed as well. To do this, a float-adjustment factor called 'traded' is first computed. This variable represents the share of a firm's stocks that are publicly traded. This is done by assuming a truncated skewed normal distribution using mean = 0.85, var = 0.05, skewness = -1.5, kurtosis = 6. These values are obtained by dividing Russell's float-adjusted market cap by the CRSP market cap. The 'traded' variable is then multiplied by the Russell market cap which I computed earlier to obtain the float-adjusted market cap for each individual stock. Then, stocks are ranked again, now based on the float-adjusted market cap to allocate them within the two individual indexes. These ranks then let me assign the right values to the firms that held those positions. Finally, a -1 lag of the Russell 2000 dummy variable is used as well.

5. Results

In this section, I present the results of my analyses and discuss any conclusions that can be drawn in relation to the hypotheses.

5.1 Hypothesis 1: Big Three ownership and the ethnicity score

The first hypothesis stated that the individual Big Three shares as well as the combined share would be positively related to the ethnicity score. Table 3 shows the results from this analysis. We can see that none of the models present any significant result for BlackRock. Model 1 shows a positive coefficient of 3.314 for Vanguard that is significant on the 0.01 level. This means that an increase of 0.1 in the Vanguard share would lead to an increase of 0.331 in the ethnicity score. This model also shows a positive relationship between SSGA and ethnicity score. This coefficient of 1.801 is significant on the 0.1 level. An increase of 0.1 in SSGA would lead to an increase of 0.180 in the ethnicity score. However, both of these effects are not significant anymore when I add year and firm fixed effects. Model 3 shows a positive relationship between Big3Share and the ethnicity score. This coefficient of 1.262 is significant on the 0.01 level. With an increase of 0.1 in Big3Share comes an increase of 0.126 in ethnicity score. Nevertheless, in Model 4 this relationship again disappears when I add fixed effects.

Overall, the models without fixed effects are largely in line with the hypothesis, but the fixed effects models are not. Nonetheless, the fixed effects models are much stronger. Models 2 and 4 both have an R-squared of 0.772 whereas Models 1 and 3 only have an R-squared of 0.201 and 0.197 respectively. Therefore the overall conclusion for this analysis would be that no strong relationship was found.

5.2 Hypothesis 2: Big Three ownership and the minority share

The second hypothesis stated that the individual Big Three shares as well as their combined share is positively related to the minority share. Table 4 shows the results for this analysis. Model 1 shows that only the Vanguard share has a relationship with the minority share. This coefficient is positive and significant on the 0.01 level. Its value of 0.396 indicates that an increase of 0.1 in the Vanguard share leads to an increase of 0.0396 in the minority share. This association, however, disappears after adding fixed effects in Model 2. In Model 3 we can see that the combined share is positively related to the minority share. The coefficient of 0.173 is significant on 0.01 level. An increase of 0.1 in the Big Three share is associated with an increase

of 0.0173 in the minority share. Nevertheless, after adding fixed effects in Model 4 again, the relationship disappears.

Comparing the R-squared values of the different models in Table 4 again reveals that Models 2 and 4 are a much better fit for this data and are therefore more reliable than Models 1 and 3. Models 2 and 4 both have an R-squared of 0.784 which is much higher than 0.109 and 0.106 for Models 1 and 3 respectively. The conclusion of this analysis would therefore be that it is not in line with the second hypothesis, because no strong relationship was found.

5.3 Hypothesis 3: Change in Big Three ownership and the ethnicity score
The third hypothesis said that there is a positive relationship between the difference in Big Three share and the ethnicity score. Table 5 shows the results from this analysis. Contrary to results from Table 3 and 4, Model 1 shows a negative relationship between the Big3increase dummy variable and ethnicity score. The computed coefficient has a value of -0.065 and is significant on the 0.01 level. This implies that when the Big3increase dummy equals one, the ethnicity score drops by 0.065. In other words, when the percentual increase in Big Three ownership is more than 1%, the ethnicity score would drop by 0.065. The one-year lag of this variable has a negative coefficient of -0.069 which is also significant on the 0.01 level. An increase of more than 1% in the previous year therefore leads to a decrease in the ethnicity score of 0.069. Nevertheless, when this model is strengthened by adding fixed effects, this relationship is not present any longer. When I substitute the Big3increase dummy variable for the overall percentual change in Big Three share in Model 3, there is also a negative association. The coefficient here is -0.001 and is also significant on the 0.01 level. This would mean that an increase of 1% in Big Three share leads to a decrease of 0.001 in the ethnicity score. The one-year lag for this variable also shows a negative coefficient of –0.001, this one being significant on the 0.1 level. An increase of 1% in the Big Three share of the previous year therefore leads to a decrease of 0.001 in the ethnicity score. This is in line with what was found in Model 1 and 2. However, when I again strengthen the model by adding fixed effects in Model 4, this relationship changes as well. What is interesting, though, is that the one year lag of the percentual change has a significant positive relationship with the ethnicity score in Model 4. The coefficient takes a value of 0.001 and is significant on the 0.1 level as well. This means that an increase of 1% in Big Three ownership in the year t-1 leads to an increase of 0.001 in the ethnicity score.

It is notable that there is a difference in sign of the coefficients between Model 1 and 3 and Model 4. However, when comparing the R-squared of the models, Model 4 seems a much better fit than Models 1 and 3. Model 4 has an R-squared of 0.790 compared to 0.196 and 0.195 for Models 1 and 3 respectively. Therefore, the results of this analysis are partially in line with what was stated in the third hypothesis.

5.4 Hypothesis 4: Change in Big Three ownership and the minority share

The fourth hypothesis stated that there is a positive relationship between the difference in Big Three share and the minority share. The results from this analysis are depicted in Table 6. Similar to Table 5, Model 1 again shows negative coefficients for the Big3increase dummy variable. This time the coefficient has a value of -0.007 and it is significant on the 0.01 level. This implies that when the increase in Big Three ownership exceeds 1% (and the Big3increase dummy variable equals one), the minority share decreases with 0.007. The lagged Big3increase shows a significant negative relationship again with a coefficient of -0.008. When the increase in Big Three share in the previous year was higher than 1%, the ethnicity score would drop by 0.008. However, these effects are no longer there when fixed effects are added in Model 2. This time, Model 3 shows no significant associations between the percentual change in Big Three share and the minority share. Nevertheless, Model 4 again does show a positive coefficient for the one year lag of the percentual change. This coefficient has a value of 9.85e-05 and is significant on the 0.05 level. An increase of 1% in Big Three share would therefore mean an increase of 9.85e-05 in the minority share.

When once more considering the R-squared values amongst the different models, Models 2 and 4 seem to have the advantage. Both have an R-squared value of 0.801 against R-squared values of 0.107 and 0.105 for Models 1 and 3 correspondingly. Overall, the conclusion for this analysis would be that it is partially in line with the fourth hypothesis.

5.5 Hypothesis 5: Two-Stage Least Squares

The last hypothesis stated that there will be a positive relationship between Big Three ownership and the ethnicity score when accounting for exogenous variation through Russell 2000 constituency. The results from the Two-Stage Least Squares regression can be seen in Table 7 and Table 8. Table 7 shows this analysis without fixed effects. Model 1 and 2 do not show any significant relationships between the Big 3 share and ethnicity score. Model 3 does

show a coefficient of -2.701 that is significant on the 0.1 level. This association is negative, which contradicts results from earlier regression analyses where this relationship was positive. Model 3 suggests that an increase of 0.1 in the Big Three share leads to a decrease in the ethnicity score of 0.2751. Table 8 shows the same analysis including firm and year fixed effects. Contrary to Table 7, Table 8 does not contain any significant results and therefore no interpretations can be made from this table.

It is interesting to note that the models in Table 8 have an extremely low R-squared. Model 1 even has a negative R-squared of -0.130 and it does not improve much with Model 2 and 3 having an R-squared of 0.010 and 0.000 respectively. Although the R-squared values found in the models in Table 7 are not particularly high, they are still much higher compared to the ones in Table 8. Models 1,2 and 3 have R-squared values of 0.188, 0.187 and 0.182 respectively. This is notable as in the previous analyses, the models with fixed effects had much higher R-squared values than the models without fixed effects. The models including fixed effects were therefore deemed a much better fit and more reliable to draw conclusions from. In this case, Table 7 seems the better and more reliable table to draw conclusions from. Still, the results are opposite of what was said in the hypothesis and therefore my expectations.

To dive deeper into this result, Figures 1 and 2 show the Regression Discontinuity Design (RDD) plots for the Russell rank and the ethnicity score with a cut-off at 1500, or differently said spot 500 in the Russell 2000. This is exactly where the Instrumental Variable starts. Figure 1 includes the entire Russell 1000 and 2000 whereas Figure 2 only shows the Russell 2000. What is noticeable here, is that both figures show a downward jump after the cut-off point. This implies that the firms with higher ranks do have a higher ethnic diversity. The major difference, however, is that in Figure 1 ethnic diversity increases when the rank increases. In Figure 2 this association is the opposite where the ethnic diversity decreases when the rank rises. This negative association only becomes apparent when we zoom in on that top 500 of the Russell 2000. Figure 3 shows another RDD plot with Big Three ownership as the dependent variable and there is also a negative trend in the top 500. This is not what was expected as the higher firms in the Russell 2000 should usually have the highest passive ownership. The small number of observations may have caused this negative trend it is therefore possibly not representative. This perhaps led to the unexpected outcomes of Table 7.

Table 3: Regression with ethnicity score as dependent variable

| | (1) | (2) | (3) | (4) |
VARIABLES	Model 1	Model 2	Model 3	Model 4
Blackrock	-0.480	-0.223		
	(0.442)	(0.364)		
Vanguard	3.314***	0.405		
	(0.564)	(0.544)		
SSGA	1.801*	0.900		
	(1.093)	(0.912)		
Big3Share			1.262***	0.151
			(0.173)	(0.189)
ROA	0.465***	0.097	0.615***	0.0933
	(0.170)	(0.106)	(0.168)	(0.105)
Leverage	0.254***	-0.067	0.286***	-0.068
	(0.084)	(0.085)	(0.083)	(0.085)
MB-ratio	0.084***	-0.004	0.095***	-0.003
	(0.029)	(0.024)	(0.029)	(0.024)
PPE	-0.251***	0.152	-0.254***	0.158
	(0.071)	(0.159)	(0.070)	(0.158)
Size	0.211***	0.107***	0.231***	0.111***
	(0.013)	(0.031)	(0.011)	(0.032)
Constant	-0.056	1.052***	-0.240***	1.020***
	(0.103)	(0.265)	(0.088)	(0.267)
Fixed effects	NO	YES	NO	YES
Observations	13,662	13,472	13,697	13,501
R-squared	0.201	0.772	0.197	0.772

Note: This table shows the OLS and fixed effects regression analyses with ethnicity score as dependent variable and the Big Three shares as the independent variables. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Table 4: Regression with minority share as dependent variable

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
BlackRock	-0.003	-0.008		
	(0.062)	(0.047)		
Vanguard	0.396***	0.032		
	(0.080)	(0.067)		
SSGA	0.195	0.030		
	(0.147)	(0.115)		
Big3Share			0.173***	0.007
			(0.026)	(0.022)
ROA	0.061**	0.018	0.077***	0.017
	(0.025)	(0.015)	(0.025)	(0.015)
leverage	0.026**	-0.001	0.030***	-0.001
	(0.012)	(0.011)	(0.011)	(0.012)
MB-ratio	0.009*	-0.004	0.010**	-0.004
	(0.005)	(0.003)	(0.005)	(0.003)
PPE	-0.024**	0.043**	-0.025**	0.045**
	(0.011)	(0.021)	(0.0105)	(0.021)
size	0.020***	0.009**	0.022***	0.009**
	(0.002)	(0.004)	(0.002)	(0.004)
Constant	-0.077***	0.045	-0.095***	0.043
	(0.016)	(0.035)	(0.014)	(0.035)
Fixed effects	NO	YES	NO	YES
Observations	13,662	13,472	13,697	13,501
R-squared	0.109	0.784	0.106	0.784

Note: This table shows the OLS and fixed effects regression analyses with minority share as dependent variable and the Big Three shares as the independent variables. Clustered standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$.

Table 5: Regression with ethnicity score as dependent variable

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Big3increase	-0.065***	-0.001		
	(0.017)	(0.012)		
L.Big3increase	-0.069***	0.003		
	(0.016)	(0.012)		
pchange			-0.001***	4.87e-05
			(0.0004)	(0.0004)
L.pchange			-0.001*	0.001*
			(0.0004)	(0.0003)
ROA	0.612***	0.236*	0.627***	0.234*
	(0.192)	(0.122)	(0.192)	(0.122)
leverage	0.324***	-0.070	0.333***	-0.070
	(0.091)	(0.095)	(0.092)	(0.095)
MB-ratio	0.090**	-0.052	0.092**	-0.052
	(0.037)	(0.034)	(0.037)	(0.034)
size	0.234***	0.125***	0.236***	0.125***
	(0.012)	(0.037)	(0.012)	(0.037)
PPE	-0.263***	0.184	-0.265***	0.186
	(0.077)	(0.176)	(0.077)	(0.176)
Constant	0.126	0.980***	0.024	0.985***
	(0.103)	(0.318)	(0.098)	(0.317)
Fixed effects	NO	YES	NO	YES
Observations	10,214	10,028	10,214	10,028
R-squared	0.196	0.790	0.195	0.790

Note: This table shows the OLS and fixed effects regression analyses with ethnicity score as dependent variable and the changes in Big Three ownership as independent variables. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Table 6: Regression with minority share as dependent variable.

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Big3increase	-0.007***	-0.001		
	(0.002)	(0.001)		
L.Big3increase	-0.008***	-0.001		
	(0.002)	(0.002)		
pchange			-1.01e-04	2.69e-05
			(7.00e-05)	(3.38e-05)
L.pchange			-1.96e-05	9.85e-05**
			(7.86e-05)	(3.93e-05)
ROA	0.072**	0.038**	0.074***	0.038**
	(0.028)	(0.016)	(0.028)	(0.016)
leverage	0.035***	0.009	0.036***	0.009
	(0.012)	(0.013)	(0.012)	(0.013)
MB-ratio	0.010	-0.010**	0.010*	-0.010**
	(0.006)	(0.005)	(0.006)	(0.005)
size	0.022***	0.008*	0.023***	0.008*
	(0.002)	(0.005)	(0.002)	(0.005)
PPE	-0.024**	0.041*	-0.024**	0.041*
	(0.0113)	(0.023)	(0.011)	(0.023)
Constant	-0.049***	0.054	-0.062***	0.054
	(0.015)	(0.041)	(0.015)	(0.041)
Fixed effects	NO	YES	NO	YES
Observations	10,214	10,028	10,214	10,028
R-squared	0.107	0.801	0.105	0.801

Note: This table shows the OLS and fixed effects regression analyses with minority share as dependent variable and the changes in Big Three ownership as independent variables. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Table 7: 2SLS with bandwidth 500 and Russell 2000 constituency as IV, no fixed effects

	(1)	(2)	(3)
VARIABLES	Model 1	Model 2	Model 3
Big3Share	-1.887	-1.985	-2.701*
	(1.556)	(1.490)	(1.523)
mktcap	0.235***	-0.771	-57.44***
	(0.071)	(1.265)	(14.34)
mktcap2		0.037	4.209***
		(0.046)	(1.046)
mktcap3			-0.102***
			(0.025)
mktcap_f	0.113*	0.121**	0.094
	(0.060)	(0.059)	(0.059)
L1.R2000	-0.075	-0.070	-0.030
	(0.059)	(0.058)	(0.059)
ROA	0.667**	0.652**	0.576**
	(0.262)	(0.260)	(0.266)
Leverage	0.173	0.182	0.163
	(0.173)	(0.174)	(0.176)
MB-ratio	0.063	0.063	0.061
	(0.055)	(0.055)	(0.054)
size	0.167***	0.165***	0.169***
	(0.023)	(0.023)	(0.023)
PPE	0.199	0.204	0.217
	(0.150)	(0.149)	(0.150)
Constant	-3.732***	2.973	259.2***
	(0.702)	(8.551)	(65.46)
Observations	1,752	1,752	1,752
R-squared	0.188	0.187	0.182

Note: This table shows the 2SLS IV analysis with ethnicity score as the dependent variable and Big Three share as the independent variable, top 500 Russell 2000 constituency is used as the Instrumental Variable. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$.

Table 8: 2SLS with bandwidth 500 and Russell 2000 constituency as IV, with fixed effects

	(1)	(2)	(3)
VARIABLES	Model 1	Model 2	Model 3
Big3Share	6.293	-0.291	-1.168
	(27.57)	(14.69)	(12.84)
mktcap	0.081	-1.385	-12.25
	(0.208)	(2.216)	(32.31)
mktcap2		0.0512	0.849
		(0.083)	(2.311)
mktcap3			-0.019
			(0.055)
mktcap_f	0.019	-0.014	-0.018
	(0.125)	(0.068)	(0.062)
L1.R2000	-0.075	-0.028	-0.017
	(0.163)	(0.082)	(0.065)
ROA	0.114	0.125	0.127
	(0.211)	(0.186)	(0.187)
Leverage	-0.175	-0.111	-0.103
	(0.375)	(0.293)	(0.284)
MB-ratio	0.041	-0.014	-0.021
	(0.232)	(0.130)	(0.118)
size	-0.090	-0.065	-0.060
	(0.120)	(0.084)	(0.080)
PPE	0.719	0.752*	0.768*
	(0.518)	(0.440)	(0.437)
Observations	1,397	1,397	1,397
R-squared	-0.130	0.010	0.000

Note: This table shows the fixed effects 2SLS IV analysis with ethnicity score as the dependent variable and Big Three share as the independent variable, top 500 Russell 2000 constituency is used as the Instrumental Variable. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$.

Figure 1: Regression discontinuity plot for ethnicity score and entire Russell 1000 and 2000 with cut-off at 1500.
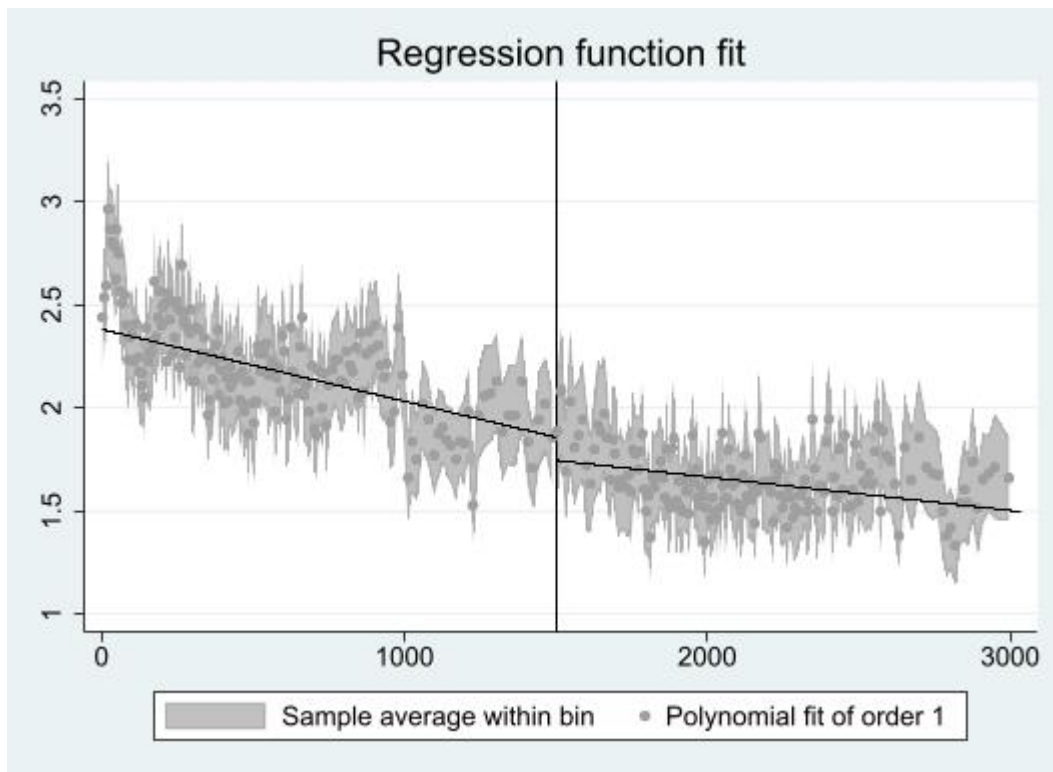

Figure 2: Regression discontinuity plot for ethnicity score and Russell 2000 with cut-off at 1500.
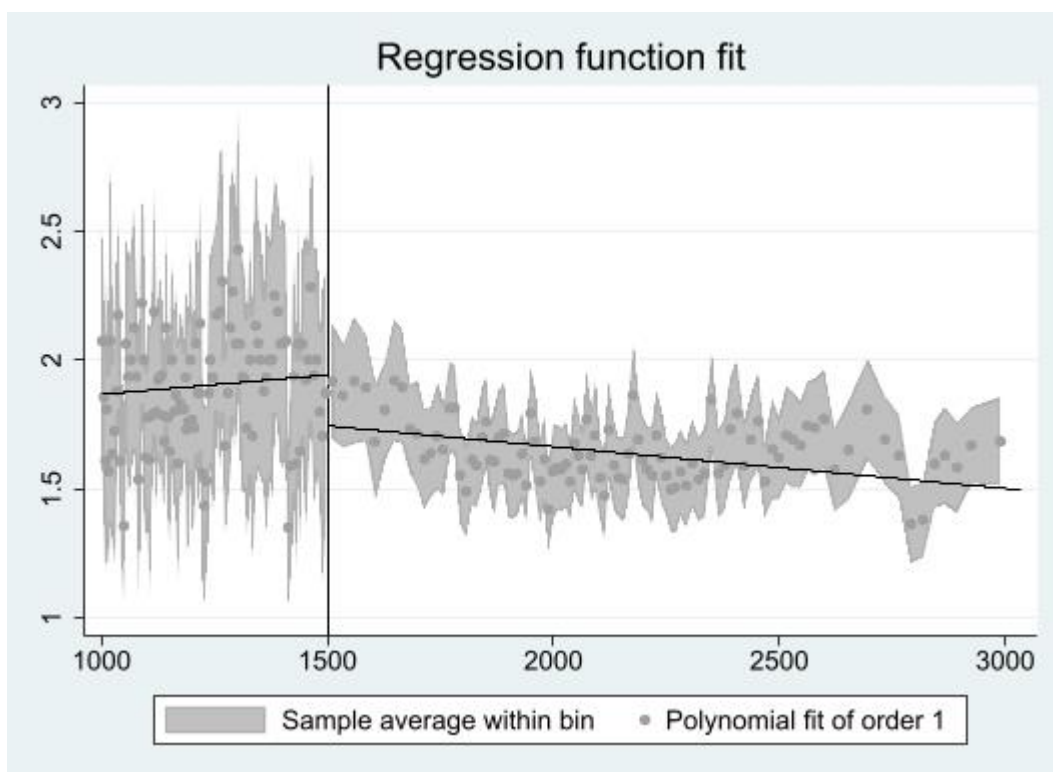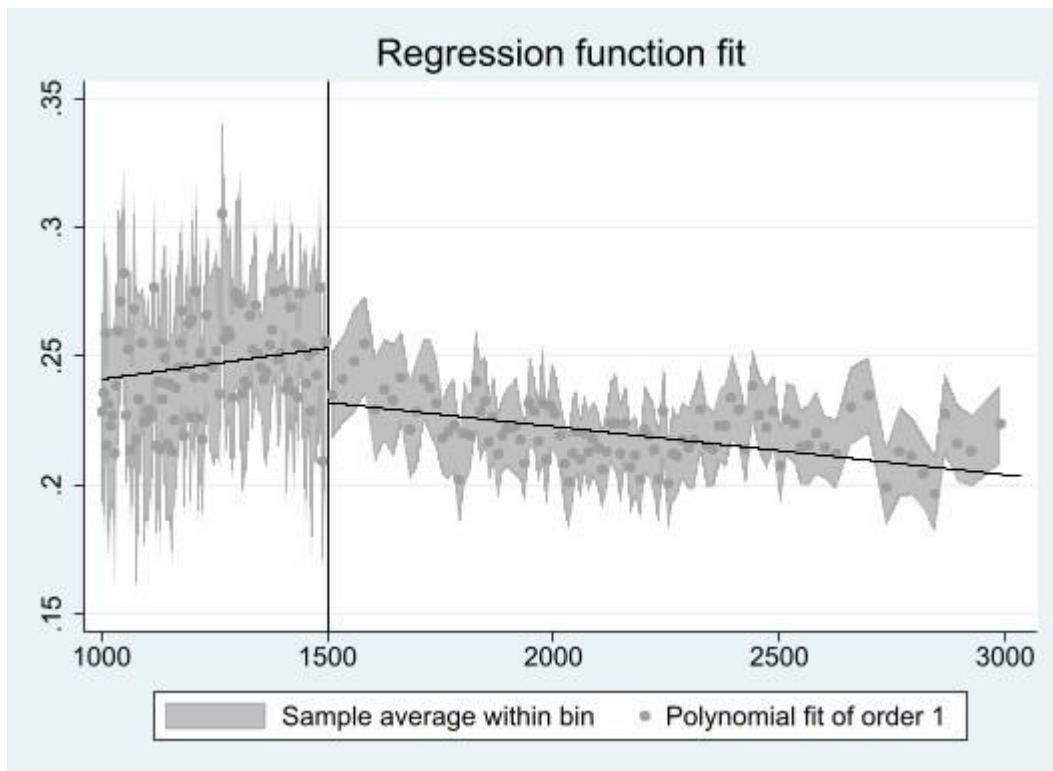
Figure 3: Regression discontinuity plot for Big Three ownership and Russell 2000.

6. Discussion

6.1 Findings

This study focusses on the relationship between Big Three ownership and ethnic diversity in U.S. boards. Additionally, it investigates whether this relationship holds when top 500 Russell 2000 constituency is used as an Instrumental Variable. The data that is used comes from Thomson/Refinitiv – 13F, Institutional Shareholder Services – Directors US, Compustat – North America and Bloomberg. This thesis finds some evidence for a positive relationship between Big Three ownership and ethnic diversity in boards. This relationship is found in two fixed effects regressions between the percentual change in Big Three ownership and the ethnicity score as well as the minority share. All other positive relationships are found in regular OLS regressions and vanish as soon as a stronger model is used by adding fixed effects. The Two Stage Least Squares analysis, however, finds a negative relationship. Nevertheless, this analysis is severely limited mainly through the number of observations and is therefore deemed highly unreliable.

Firstly, I examined whether there was a positive relationship between the individual and combined Big Three shares and ethnicity score within the boards. The results of this analysis were that a positive relationship was only found in weaker models without fixed effects. This positive relationship only existed for Vanguard and the combined Big Three share. The stronger models showed no indication of a positive association, nor that of a negative association. Furthermore, I investigated the second hypothesis that stated that there is a positive relationship between the individual and combined Big Three shares and the minority share of boards. The results for this analysis are similar to those of the first hypothesis. A positive relationship is solely found for Vanguard and the combined Big Three share and this is exclusively found in the weaker models where fixed effects have not been added. Overall, the results from these analyses are not in line with my expectations. As mentioned earlier, the Big Three have made commitments on tackling ethnic diversity. Gormley et al. (2022) and Azar et al. (2021) both found that the Big Three follow up on their statements and commitments on gender diversity as well as carbon emissions. I therefore predicted that the Big Three would also follow up on their commitments regarding ethnic diversity. Hence, the outcomes of this research are somewhat surprising.

Secondly, I investigated the third hypothesis that stated that there is a positive relationship between the change in Big Three share and the ethnicity score. When examining the results, I found a positive relationship between the one-year lag of the change in Big Three share and the ethnicity score. For changes of more than 1% a negative relationship was found. However, this association was only present in weaker models and disappeared when strengthening the models with fixed effects. Moreover, I investigated the fourth hypothesis that stated that there is a positive relationship between the change in Big Three share and the minority share. In this case, the results are similar to those of the third hypothesis. The positive relationship was only found between the one-year lag of the change in Big Three share. Once again, the negative relationship for changes of more than 1% was solely found in the weaker models. The results from these two analyses are more in line with my expectations than those from the first two hypotheses. These results indicate that an increase in Big Three ownership leads to an increase in the ethnic diversity in boards, when we allow for some time to go over it. Comparing the results from the first two hypotheses to the third and fourth hypotheses, they do not seem to coincide. Considering how I did find an effect when a time lag was used, it could be the case that when more time passes since the commitments were made we can incorporate this time factor better into our analysis and this may yield clearer results.

Finally, the results from the 2SLS analysis seem to go against the previous analyses. The 2SLS results indicate that there is a negative relationship between Big Three ownership and ethnic diversity in boards when we account for exogenous variation caused by Russell 2000 constituency. This is not at all in line with what was expected and is questionable. Glossner (2021) found that firms with many ESG incidents were less profitable. Additionally, Gibson et al. (2020) state that portfolios with better sustainability footprints tend to have improved risk-adjusted performance. Considering this, it would be unexpected if the Big Three would, unknowingly or not, lead to a worsened ethnic diversity.

6.2 Implications

Although the results of this paper are not too strong, it does show areas that further research can improve upon. These will be discussed in a later section. Also, it sheds light on a more societal debate of how much power these asset managers hold and whether that is desirable. The positive relationships that were found for the third and fourth hypotheses mean that the Big Three have a large influence on ethnic diversity within board positions that in their turn

hold lots of power. This can especially have a large influence on societies that are subject to a diverse demographic, as representation becomes more diverse. One could argue that this is not the responsibility of profit maximising firms, but rather that of a government. On the other hand, it can be argued that improved diversity cannot be achieved by a government itself and that firms should cooperate as well. Nevertheless, following statements from the Big Three it does not seem that these commitments are made together with governments or other governing entities (Kishan, 2020; Kerber, 2020; Kerber & Dinapoli, 2021; Patterson, 2023).

Similarly, the results from the 2SLS analysis raise concerns as well. If this relationship is indeed negative, it would be concerning to see that ESG goals are seriously being hampered by firms that are extremely powerful. The Big Three's power will continue to grow as they gradually turn into the 'Giant Three' (Bebchuk and Hirst, 2019) and this will only increase our reliance on their decision-making. Their influence on issues such as diversity has large implications that society needs to deal with.

6.3 Limitations & Future Research

A big limitation of this thesis is the methodology that was used for the first four hypotheses. Using regular OLS regressions does not allow me to make any conclusions on causal effects. The main concern in this type of analysis is Omitted Variable Bias and although I used multiple control variables, the threat of Omitted Variable Bias can never be fully ruled out. This means that the coefficients found in the models without fixed effects, despite being significant, are not reliable. Furthermore, in the first two analyses no relationship was found in the fixed effects models. This could be caused by the dataset that was used, as I did not have access to more extensive data. As mentioned in the Data section, the ISS – Directors US only consisted of S&P 500 listed firms, which rules out many other firms. Moreover, it is generally difficult to find datasets that include the ethnicity of directors since this is sensitive and personal information. This also caused issues in the 2SLS regression analysis where the number of observations was quite low compared to what it could have been. When using a banding of 500 for a dataset that includes the Russell 1000 and the Russell 2000 over the period of 2011-2022, 1,752 observations is only a small share of what the total number of observations could have been. This makes the results from the 2SLS not so trustworthy. I would recommend that future researchers will try to obtain the ethnic background of directors across more firms.

Moreover, the methodology used for the minority share regressions may have led to a model that was not the best fit. Although it is not a dummy variable, the minority share variable is still bounded between 0 and 1. However, the incorporation of firm fixed effects as well as clustering the standard errors by firm made it difficult to use a regression method that was more fitting to the way that minority share was constructed.

Additionally, the timeframe of this research may not be as fitting. The statements that the Big Three made on this topic come from around 2020/2021. As this research is being conducted in 2023, firms may not have had the time yet to make meaningful changes to their board structures. Especially considering how the Covid-19 pandemic may have slowed things down even more. The results from the third and fourth hypotheses also indicate that there is a lag between an increase in ownership and changes being made. Therefore, it would be wise to wait around five years to conduct more research on this topic. Not only will it allow for the effects to settle in, it will also enable researchers to incorporate more lags into their analysis.

Finally, the way ethnicity is categorised severely limits the extent of diversity in the analysis. For example, two individuals that are both classified under Hispanic/Latin American could still have contrasting ethnic backgrounds. The term Hispanic refers to language, whereas Latin American refers to people from that area. Therefore, an individual from Spain and an individual from Brazil would be allocated to the same category, despite being from distinct backgrounds. To go even further into this example. The Spanish individual may even consider themselves Caucasian/White. Such problems arise in many of these categories; a Central Asian individual differs significantly from someone from Southeast Asia, yet they are viewed and classified as the same. This flawed system makes for flawed analyses when researching ethnic backgrounds. It underestimates the diversity within boards and may even misclassify individuals.

7. Conclusion

To conclude, this paper aimed at answering whether there is a relationship between Big Three ownership and ethnic diversity within U.S. boards. In the initial OLS regression analyses some positive relationships were found between Big Three ownership and ethnic diversity, however these disappeared when strengthening the models. Using fixed effects, a stronger positive relationship was found between the one-year lag of change in Big Three ownership and ethnic diversity. On the other hand, when accounting for exogenous variation in ownership by Russell 2000 constituency, there is a negative relationship between Big Three ownership and ethnic diversity. As this last analysis is highly limited, I do not consider it to be reliable and therefore this paper finds a positive relationship between Big Three ownership and ethnic diversity in U.S. boards.

Still, the outcomes of my analyses are not entirely in line with what I expected based on previous literature. I foresaw that the positive relationship that I found would be more prominent throughout all analyses and this is likely caused by a number of limitations. Overall, this is merely a master thesis with a highly limited scope in terms of time and resources. My recommendations for further research would be to conduct it again about five years into the future and using more time lags. Also, to look for a more extensive dataset containing information on the ethnicity of directors. Finally, research and society would benefit from a shift in defining race/ethnic backgrounds and making the categorisations more thorough, such that it becomes a better representation of ethnic diversity.

Generally, this thesis has societal implications as well. It comments on the power that the Big Three hold to make changes in the area of ESG, something that affects people's day-to-day lives. This can spark a debate on whether these powers should be mainly lying in the hands of profit maximising companies or whether they should be incorporating governments or other entities like certain United Nations committees. This could be in the form of cooperations, but also regulations when the activity of the Big Three is negatively affecting society.

8. Appendix

Table 9: regression with change in ethnicity score as dependent variable

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Big3increase	-0.546	-0.135		
	(0.588)	(0.669)		
L.Big3increase	-1.251**	1.061		
	(0.618)	(0.693)		
pchange			0.004	0.004
			(0.017)	(0.019)
L.pchange			-0.004	0.0161
			(0.015)	(0.016)
size	-0.318**	0.327	-0.276*	0.267
	(0.150)	(1.206)	(0.149)	(1.205)
PPE	-1.252	8.660	-1.298	8.747
	(0.969)	(7.497)	(0.972)	(7.496)
ROA	3.949	1.328	4.146	1.397
	(3.422)	(6.402)	(3.427)	(6.409)
MB-ratio	0.630	-0.998	0.640	-1.052
	(1.213)	(1.598)	(1.203)	(1.602)
leverage	3.538***	5.071	3.757***	5.023
	(1.321)	(4.073)	(1.319)	(4.077)
Constant	10.18***	-0.131	8.544***	1.138
	(1.556)	(10.25)	(1.369)	(10.26)
Fixed effects	NO	YES	NO	YES
Observations	10,214	10,028	10,214	10,028
R-squared	0.002	0.130	0.001	0.130

Note: This table shows the OLS and fixed effects regression analyses with change in ethnicity score as dependent variable and the changes in Big Three ownership as independent variables. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Table 10: regression with change in minority share as dependent variable

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Big3increase	-0.603	0.326		
	(0.890)	(1.048)		
L.Big3increase	-2.420***	0.0449		
	(0.931)	(1.055)		
pchange			0.003	0.017
			(0.030)	(0.036)
L.pchange			-0.006	0.020
			(0.022)	(0.023)
size	1.159***	3.018	1.234***	2.922
	(0.246)	(2.138)	(0.243)	(2.121)
PPE	-2.386	20.58	-2.490	20.70
	(1.583)	(13.02)	(1.585)	(12.99)
ROA	10.54*	8.384	11.08*	8.321
	(5.796)	(10.41)	(5.808)	(10.39)
MB-ratio	-0.517	-0.491	-0.500	-0.524
	(0.951)	(2.157)	(0.969)	(2.163)
leverage	1.097	5.420	1.437	5.389
	(2.115)	(6.691)	(2.126)	(6.719)
Constant	-2.200	-27.90	-4.942**	-27.03
	(2.658)	(19.69)	(2.345)	(19.46)
Fixed effects	NO	YES	NO	YES
Observations	6,810	6,561	6,810	6,561
R-squared	0.005	0.164	0.004	0.165

Note: This table shows the OLS and fixed effects regression analyses with change in minority share as dependent variable and the changes in Big Three ownership as independent variables. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, *$p<0.1$

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