Determinants of Brokerage Fees and Executive Compensation in the Mutual Fund Industry
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I. Introduction

The financial literature surrounding mutual funds has been mostly focused on fees and performance. Only in the last few years have mutual fund board structure and corporate finance been gaining momentum. Researchers are divided with respect to the extent and impact that corporate finance has on mutual funds. General support among academics can be found around the importance of mutual fund assets size and economies of scale as fees’ reduction mechanisms. Additionally, multiple authors agree that mutual fund fees, in particular 12b-1 fees, are a net expense and erode fund’s customers’ returns. However, researchers are not as likely to agree on other aspects of mutual funds structure, or the impact that corporate governance has on mutual fund performance and fees.

Certain mutual funds’ fees have not been addressed yet by the financial literature; Brokerage fees are not part of the funds’ expense ratio and can only be found in the funds’ statement of additional information, SAI. Mutual funds are not required to send out SAIs to investors, they are only distributed upon request. I believe, that brokerage fees are substantial enough to deserve a more comprehensive approach than what the financial literature has provided thus far. Mutual fund transaction costs could be quite substantial, Edelen et al. (2007) hypothesize that they might be as large as the expense ratio; by my own estimation, from my hand-collected samples, brokerage fees oscillate between 27 percent of the expense ratio in 1998 (the first year in the panel dataset) and 14 percent of the expense ratio for the year 2015 (only year in the cross-sectional sample). Similarly, following the long tradition in corporate finance to analyze compensation schemes in conjunction with firms’ characteristics and corporate governance measurements, mutual funds’ directors’, chairmen of the board’s (COB), and managers’ compensation have not received the same level of attention that their corporate firms’ peers have enjoyed.

Hence, my contribution to the mutual fund literature intends to be twofold. First, I seek to clarify the determinants of mutual funds’ directors’, COBs’, and managers’ compensation. Second, I aim to dissect brokerage fees, identifying their relationship with other mutual fund expenses, characteristics, etc.
In both cases I am specifically interested in the role corporate governance plays. I want to identify the elements and incentives that influence directors’, COBs’, and managers’ compensation in the mutual fund industry; this proposition is a common question in the Chief Executive Officer (CEO) compensation literature. Alternatively, since funds managers are not required to minimize brokerage fees and obtain research perks in return for order flow; I question if it is possible that managers from funds with independent directors receiving higher compensation, weak corporate governance, and under potentially less supervision, are paying too much to trade on behalf of mutual fund customers and sacrificing efficiency in favor of convenience.

II. Literature Review

A recent article in *The New York Times* urges mutual fund investors to ‘watch the fees, and don’t look back’ especially given that mutual fund managers’ past performance have become a common marketing tool (Sommer, 2014). In an effort to increase financial literacy, on March 31st of 2004, the Securities and Exchange Commission (SEC) amendment of Rule 482 was approved. This amendment establishes strict rules that specify how past performance must be computed and reported to investors. Furthermore, it requires mutual fund firms to include a warning disclosure in their ads, specifically those mentioning past performance, to clarify that good past returns does not guarantee comparable future yields. This New York Times’ article echoes a study by Russel Kinnel (2010), the director of research at Morningstar, a leading source in mutual fund information for practitioners. In 2014, another one of Kinnel’s articles revisits a widely accepted idea: the pernicious effect of fees on mutual fund investors’ portfolios. Using a methodology that is reminiscent of the Fama and French (1993) seminal article, Kinnel (2014) classifies mutual funds by investment category and also by quintiles according to their expense ratio. The beginning of The Great Recession in June of 2008 serves as Kinnel’s (2014) article starting point. The author notices that high-expense-ratio funds are less likely to survive than funds with
low expense ratios over the six years after 2008. By selecting funds from the quintile with the lowest expense ratios in 2008, 2009 and 2010, an investor would have been more likely to outperform any mutual fund from any other expense ratio quintile, especially the funds with the highest expense ratios. The results also hold for any investment objective and share classes (Kinnel, 2014).

Kinnel has considered expense ratios and performance before; one of his prior articles compares expense ratios against Morningstar’s star rating in their ability to predict future performance (Kinnel, 2010). The Morningstar’s rating, introduced in 1985, is a measurement of mutual funds’ past expenses and risk-adjusted performance used to assign a score from one to five stars. To form these ratings, Morningstar’s analysts take into consideration five key criteria: overall quality of a fund’s investment team, fund family, investment process, past performance, and fund expenses. The Morningstar’s global analyst team assesses these five criteria to calibrate their relevance in tracking fund success (Morningstar Fund Research Group, 2011). However, Kinnel (2010) finds that expense ratios are better at predicting future fund performance than Morningstar ratings. He focuses on funds at the opposite ends of the spectrum in terms of expense ratios and star rating during the period 2005-2008. According to his research, the funds located in the quintile with the lowest expense ratio have a larger probability of surviving and outperforming others relative to the funds located at the highest expense ratio quintile. Similarly, the proportion of funds that survive and outperform their peers is also larger for funds from the quintile with the coveted Morningstar five-star rating than for funds from the quintile classified with only a single star. However, the expense ratio criterion does a better job predicting future fund success, as measured by survival rate and performance, than the Morningstar rating. Kinnel (2010) also considers other possible factors such as manager turnover, overall riskiness, or the asset size of the mutual fund parent company to discover that over eighty percent of the star rating variability is explained by the mutual fund’s expense ratio (Kinnel, 2010). Similarly, Porter and Trifts establish that mutual funds’ expense ratios are the most important predictor of mutual funds achieving a five star rating from Morningstar (Porter & Trifts, 2014).
There is increasing awareness even among practitioners in regards to the harm caused by fees and other expenses on investors’ returns. In this regard, Malkiel (2013) notes that mutual funds’ management fees have increased significantly, to the point that they have strengthened the financial sector’s contribution to U.S. Gross Domestic Product (GDP). Malkiel (2013) believes that the reason why the contribution of the financial sector to the United States economy has nearly doubled between 2006 and 1980, reaching 8.3 percent of the GDP, is the significant increase in the level of asset-based management fees charged. The quantity of assets under professional management has also soared and hence asset-based management fees, which are calculated as a percentage of assets, have increased proportionally.

Malkiel (2013) would not consider this problematic if the increase in fees is justified, i.e., if it is accompanied by superior performance of actively managed funds or if it ensures superior market efficiency. Nevertheless, the author cites several studies that confirm how the majority of passively managed mutual funds tend to outperform their actively managed counterparts, dismantling the argument that management fees constitute the payment for higher performance. Furthermore, the author could find no evidence of increasing market efficiency with respect to 1980 or 1990. Hence, Malkiel (2013) findings actually portray management fees as an important inefficiency in the financial markets. The author also warns readers against reports of decreasing mutual fund fees. The mutual fund market has expanded tremendously; this expansion allows financial firms to benefit from considerable economies of scale, which apply to the mutual fund industry (Golec, 1996; Malhotra and MacLeod, 1997; Tufano and Sevick, 1997; Iannotta and Navone, 2012). However, investors benefit very little from these economies of scale while managing firms are extracting most of the rents. One of the reasons why reports of average reduction in mutual fund fees are prone to appear is the introduction and continuous expansion of index funds. Index funds withstand a very competitive environment transfer more of the scalability savings to investors, judging by their very low expense ratios. At the time Malkiel’s (2013) article is published, index funds accounted for one third of the total mutual fund industry measured by assets. Moreover, the author believes management fees have increased so much that they have overcome any possible savings investors have experienced from the reduction in brokerage fees or trading costs (Malkiel, 2013).
If Malkiel’s (2013) statements with respect to decreasing fees are in fact correct, investors should be skeptical in regards to several news outlets reports, including the International Herald Tribune, ABC News, etc. that echoed a 2014 article also published by Morningstar that asserts that average expense ratios have been on a downward slope since the turn of the twenty-first century. Kinnel (2014) claims that expense ratios from the point of view of the average investor and the average fund have been receding. The decline in the last few years is in part driven by overall positive performance in the stock markets, which triggers breakpoints in mutual fund management fees. These breakpoints allow investors to enjoy a small portion of the economies of scale present in the mutual fund industry. Kinnel’s (2014) article documents a reduction, on average, of mutual fund fees weighted by assets. The popularity of index funds definitely has an impact reducing these averages. Moreover, investors are also more knowledgeable about the importance of picking the mutual fund with the smallest possible fee structure to help boost their portfolio returns; as a consequence, the importance of passively managed funds has also exploded in the last decade (Kinnel, 2014).

Even if some mutual fund fees are in fact shrinking, their impact on portfolio performance is not. The fairness of management fees charged by mutual funds motivated the 2010 Supreme Court decision in the Jones v. Harris Associates case. Harris Associates’ average retail investors were charged 88 basis points, twice as much as institutional investors from the same funds were. The court decided to unanimously uphold the Gartenberg standard. Various observers have interpreted this decision as a defeat for mutual fund investors. The Gartenberg standard, as articulated by the Second Circuit Court of Appeals in 1982 in the Gartenberg v. Merrill Lynch Asset Management case, concludes that for a fee to be considered excessive it has to be disproportionally large and bear no relationship to the service provided (Silverblatt, 2010). Such a broad and vague conclusion makes it difficult for investors to argue that mutual funds are withholding too much of their money in fees. A Supreme Court ruling like the one cited above made possible the introduction of multiple class shares in the early 1990s. In fact, having multiple class shares allows for larger spreads in fees. This ruling is also echoed in Adams et al. (2012);
the authors establish mutual fund fees are excessive. The authors pinpoint that having multiple class shares allows for price discrimination. Funds can masquerade larger fees as long as they allocate them to investors that are willing to pay more. Institutional investors do not see such large increases in mutual fund fees, because the mutual fund market for institutional investors is more competitive, and institutional investors are aware of the impact that fees have on performance over time. Unlike for institutional investors, financial illiteracy is widely spread among retail mutual funds’ customers. This problem is exacerbated by asymmetric information and agency concerns. Superior knowledge from mutual fund managers allows for the incentives of parent companies and those from the pool of individual customers to not be aligned. To address this possible agency problem, in 1970 congress introduced Section 36(b) to the Investment Company Act of 1940. Section 36(b) imposes fiduciary responsibility on mutual fund sponsors to discourage disproportionate fees relative to the services provided. Adams et al. (2012) manually collected 1,050 unique observations from 1998 to 2007 pertaining to 165 mutual funds. This panel dataset allows the authors to establish some relationships between mutual fund characteristics and the level of fee spreads. Accordingly, Adams et al. (2002) determine that large mutual fund fees are usually found in mutual funds that offer multiple shares classes; specifically, there is a dramatic increase in expense ratios for funds offering three share classes or more. Mutual funds offer multiple share classes in order to increase overall fund size and, as a consequence, fee revenue. However, there is a parallel increase in marketing expenses as a result of targeting multiple investors’ pools with different types of shares. Their analysis also relates corporate governance with the level of management fees. Funds that have weak governance structures in place, approximated by low institutional ownership, a small number of independent directors, or large board size, tend to have higher total expense ratios. The weak governance structure variables are significant determinants of expense ratios for multiple-shares funds; nonetheless, this is not the case for single-share funds. The idea of expense ratios increasing with board size has been considered before; Jensen (1993) and Lipton and Lorsch (1992) link larger corporate boards to lower firm value or lower performance, since larger groups are more difficult to coordinate and are less focused. Alternatively, having a predominantly independent board reduces, on average, the fund total
asset-weighted expense ratios. The degree of institutional ownership is negatively related to expense ratios. Institutional owners are frequently believed to bring discipline to the firms in which they invest and to strengthen their governance structures. Finally, fees are also higher for funds owned by publicly held sponsors. Since these publicly held sponsors are in charge of selecting the board of directors, which ultimately negotiates the fees, the effectiveness and independence of mutual fund boards is in question. The authors propose agency problems, due to the conflict of interest between the publicly held sponsors managing the funds, and the funds’ customers, as a possible explanation for their discoveries (Adams, Mansi, & Nishikawa, 2012).

Management fees constitute a large portion of mutual funds fees. According to my estimates, from the hand-collected sample of mutual funds for the year 2015, management fees make up for 44 percent of the total expense ratio (please refer to table II, the cross-sectional dataset descriptive statistics). Malkiel (2013) believes that the financial intermediaries’ industry is mainly designed to compensate mutual fund managers for role at the helm of these investment vehicles. Golec (1996) studies the relationship between mutual fund fees, performance, and risk. According to the author, mutual fund investors should avoid funds with high administrative expenses while favoring funds with large management fees. Large management fees signal, in his opinion, greater investment skills, which in return provide superior performance. The author uses management fees to approximate managers’ compensation because salaries are not disclosed individually. According to this study, following the theoretical model presented by Golec (1992), managers’ personal abilities simultaneously determine the funds’ tradeoff between risk and performance, while also indirectly establishing their compensation through the fees that are charged. Golec (1992) believes most managers are risk averse and their salaries need to provide them with incentives to take risks. Years later, the author provided empirical evidence to support his theories. Golec (1996) uses a Three-Stage Least Squares method (3SLS), a system of three simultaneous equations, which includes separate expressions for risk, performance, and fees, to identify the relationship between these three defining mutual funds’ endogenous variables. The independent
characteristics used to determine return, risks, and fees are mainly managers’ traits and funds’ characteristics. Golec (1996) considers managers’: age, tenure, level of education, and also funds’ characteristics: such as age, asset size, loads charge, and objective. He uses a similar sample size to Malhotra and McLeod (1997) of about 500 funds and also focuses on three consecutive years 1988-1990. Managers’ skill level is approximated with Jensen’s alpha, a measure of portfolio performance adjusted for systematic risk. Golec (1996) is capable of identifying long manager tenure as a robust predictor for funds’ performance; however, the managers’ age does not have a positive impact on the returns of the portfolios he manages. Additionally, the managers’ years of education are irrelevant to funds’ performance, but having completed a Master of Business Administration, MBA, has a positive marginal effect. Overall, his most notable result is that funds with lower operating expenses perform better but performance is strongly and positively associated with management fees (Golec, 1996). The author’s findings relating to risk are more intuitive. In his findings, both of the instruments employed to measure risk, beta and the standard deviation of the monthly returns over the prior year, emerge as statistically significant and positively related to management fees. Larger portfolio turnover is positively related to risk and so is managers’ youth and the added confidence of having an MBA. One could expect younger mutual fund managers with an MBA, to trade more frequently and aggressively, increasing the mutual funds’ risk profile. These results are reinforced by the fee structure findings. Older managers tend to trade less and therefore accumulate lower brokerage fees and other expenses; similarly, managers with longer tenures tend to keep fees low. Finally, the author also finds evidence to support economies of scale in the industry; larger and older funds tend to have lower fees (Golec, 1996).

Although several academic studies on mutual funds address issues of fees and performance, not as much attention has been directed towards board structure and its implications on mutual fund manager compensation. Malhotra and McLeod (1997) identify some of the determinants of mutual funds fees. The authors switch their initial focus on past performance and they end up studying mutual fund fees and recommending investors to pay attention to instead when deciding where to invest. First, the authors
notice that mutual fund expenses are more stable with a constant and slow deterministic upward trend. On the contrary, past performance tends to be mean reverting and erratic. After making their initial recommendation to prospective investor to identify funds with lower fees, Malhotra and McLeod (1997) employ a small sample, extracted from the Business Week Mutual Fund Scorecard for two years from 1992 to 1993, to further analyze the determinants of fee structure. Their model includes asset size, two past performance measures, loads, investment objective, turnover, cash ratio, beta, and a categorical 12b-1-fee variable. The authors confirm the existence of economies of scale in the mutual fund industry; since larger and older mutual funds charge, on average, lower fees. They also analyze the impact of new regulation on mutual funds and confirm that the 12b-1 rule constitutes a net expense and is not a cost reduction mechanism as it is originally presented. Similarly, the authors identify funds with sales charges as also having higher expense ratios (Malhotra & McLeod, 1997).

Years later, Golec (2003) also analyses mutual fund expenses empirically; however, this time he focuses on the impact of changes in regulations on mutual funds fees. Government intervention is partly responsible for the endorsement of asset-based fees, which are mostly spent in management and marketing related expenses. First, the author records the increase in mutual fund expense ratios and particularly in management fees as a consequence of legal changes that made performance-based fees unappealing to mutual fund companies. These legal changes that resulted in restrictions against performance-based fees are enacted by the 1970 Amendment to the Investment Company Act of 1940. This Amendment prohibits mutual funds from giving asymmetric bonuses; performance-based fees have to reward good returns at the same rate they penalize bad performance; this type of incentives are known as fulcrum fees. As a consequence of the new SEC regulation, the number of mutual funds charging performance-based fees is negligible at the time of his study in 2003. After the 1970s’ regulation, mutual funds maximize profits by just increasing the size of the assets they manage instead of by improving performance. Golec (2003) notes that prior to 1970, it was common for a mutual fund to charge performance fees or bonus fees for outperforming a certain benchmark. Nevertheless, actively managed
funds were unusual before the market crash of 1929. The recession prompted mutual fund firms to look for ways to charge customers periodic fees for actively managing their portfolios, to compensate for the decrease in performance fees. Another consequence of the 1970s change in regulation is the increase in marketing expenses. Marketing expenses, designed to attract investors, have prompted increasing concentration of the mutual fund industry to a few large players. Despite low barriers to entry and the size of the U.S. mutual fund market, the share of the assets held by the mutual fund families leading the industry remains largely unchanged from 1990 to 2015. According to the Investment Company Institute (ICI), which is the national association of U.S. Investment companies and the world’s leading association of regulated funds, including mutual funds, exchange-traded funds etc., during the 1990-2015 period, the size of the mutual fund market in U.S. dollars has grown from 1 trillion to over 15 trillion, but remains highly concentrated; over 70 percent of the industry’s assets are invested in the 25 largest mutual fund families, with the same 15 families still remaining in the top 25 throughout this 15-year period. During the last 15 years, the share of assets managed by the five largest families rose from 32 percent to 45 percent, while the ten largest firms increased the ratio of total assets they control from 44 to 56 percent (Investment Company Institute, 2016). To test Golec’s (2003) hypotheses on the impact of the 1971 regulation, the author follows two small samples of mutual funds before and after the regulation is enacted. Golec (2003) reports a significant increase in expense ratios after the 1970s regulation that disincentivized performance fees’ became effective. Management fees drove the increase in expenses while loads actually decreased. Golec (2003) suggests that investors might be reluctant to pay a large one-time load but they are not as conscious about the impact of paying relatively small fees over time. The results show a definite change in mutual funds’ behavior likely influenced by the change in legislature. The average fund that implemented performance fees before 1970 was young and small. After 1971, funds charging performance fees almost disappear. Before 1970, funds using performance-based fees had higher alpha, after 1971 the funds using this type of fees pursue higher beta, as measured by the market model. Before 1970, it is possible to distinguish between marketing and performance-based funds. After 1971, the author documents a change towards marketing funds, which are interested in
capturing more investors using extensive advertising, and this change is parallel to a decrease in average fund performance (Golec, 2003).

The same year, Elton et al. (2003) also consider incentive fees and how they influence managers’ behaviour. Incentive fees are considered part of the managers’ variable compensation and reward managers when the portfolios they control outperform a certain benchmark. The authors share with Golec (2003) the notion that the 1970 Amendment to the Investment Company Act of 1940 had irrevocable consequences on the way incentive fees are applied to mutual funds. Lobbyists’ efforts were able to ensure that only a particular type of performance fee, known as the fulcrum fee, apply to mutual funds. The fulcrum fee has the peculiarity to be centered on a benchmark with symmetric rewards and penalties for outperforming or underperforming it. This fee symmetry contrasts with incentive fees in the hedge fund or pension fund industry, which discards the possibility of a negative fee. The use of a benchmark also establishes a higher watermark for incentive fees, and this also applies to the mutual fund industry. As noted by Golec (2003), the 1970 Amendment dramatically decreased the number of mutual funds offering incentive fees; according to Elton et al. (2003), in 1999 the portion of mutual funds using incentive fees is approximately 1.7 percent, but accounted for over ten percent of the total assets under management in the industry. The fact that the proportion of assets under management for funds charging incentive fees is much larger than the proportion of mutual funds using incentive fees helps the authors build one of their main propositions; Elton et al. (2003), expect mutual funds using incentive fees to attract more fund flows from new investors. The authors also anticipate a stronger alignment between portfolio managers’ and customers’ objectives as a consequence of incentive fees, either induced by higher managers’ effort or the potential of higher pay attracting managerial talent. On the contrary if incentive fees do not attract managerial talent and superior investment skills, managers trying to outperform the benchmark might take more risks or invest in non-benchmark assets. Furthermore, the authors carefully distinguish between internal and external portfolio managers. Internal managers hold a position inside of the fund’s parent company and they are likely more confident about the stability of their
employment; this circumstance may entice them to take more risk. Moreover, it is also possible that they have more influence on their compensation structure or the benchmark selection. Elton et al. (2003) note that in addition to the fulcrum fee, the majority of mutual funds also charge a fixed fee. Hence, in most cases it is possible to express the combination of both fees as a never negative fee; this simple transformation facilitates the empirical study of the fee structure. The non-negativity of the fees and the monotonically increasing and convex shape of the incentives impact beta and alpha contrariwise. It is optimal for funds charging incentive fees to have a beta larger than one because their beta is attenuated post-fees; alternatively, the post-fee alpha tends to be higher. These combined elements induce managers to even take more risks. To test their hypotheses, Elton et al. (2003) use between 40 and 100 mutual funds per year from 1990 to 1999. They match their incentive-fee sample with a sample of mutual funds of similar size and investment objectives that do not use incentive fees. Their empirical analyses show persistence on prior performance. They also confirm that inside managers earn higher fees, which the authors interpret as an indication of their influence on benchmark selection and incentive strategy design. Their results reveal that after several periods of bad performance, incentive-fee funds are more likely to switch to funds that only charge fixed fees; this change always results in higher revenues for the funds. The incentive fee funds group has a statistically and economically significant positive alpha even after controlling for their lower fees. This positive alpha could be interpreted as superior managers’ investment abilities from the incentive-fee mutual funds. Most managers deviate from their declared benchmark in an attempt to outperform it and earn positive fees. Paradoxically, this translates into a counterintuitive low beta, which is sub-optimal given the convexity of the incentive function. The deviation from the benchmark is more pronounced for funds experiencing poor past performance; such funds also tend to increase their risk profile in the subsequent periods. The authors believe that offering incentive fees not only is a good marketing strategy, since these types of funds attract more new investment flows, but also attracts managerial talent and incentivizes managers properly (Elton, Gruber, & Blake, 2003)
More recently, Edelen et al. (2012) also focus on fees and investor behavior. They are one of the only few examples in the financial literature that actually considers brokerage fees and distribution costs. The authors are interested in how the way distribution costs are charged affects agency problems. Mutual fund managers can decide how to charge and report distribution costs; they can report them separately as expenses or bundle them with brokerage fees. If they charge them as expenses, distribution costs are included in the expense ratios. On the contrary, when distribution costs are bundled with brokerage fees they are not be reported in the expense ratio nor they appear in the prospectus. The authors suspect that managers who decide to bundle distribution costs and brokerage fees are trying to avoid mutual funds’ customers’ scrutiny. Since bundled expenses reduce transparency, they also increase agency concerns. The authors collect their bundled expenses information from SEC’s filings and complement them with mutual fund data from Morningstar. Edelen et al. (2002) devise a way to divide the expenses reported as brokerage fees in two components: the predicted portion and the unexplained or residual part. The residual part is obtained as the error term from a regression of total commissions on individual mutual funds, fund families, broker and investor characteristics, that should, from the author’s perspective, account for the majority of the variability of distribution fees. Next, the authors go on to study the effect of the predicted and residual components on performance. Their findings confirm some of the results presented in the prior financial literature; size is negatively related to performance at the fund level; alternatively, the effects of expense ratio and turnover on performance are not significant. Focusing on commissions, the predicted component has no significant effect on performance; however, the residual component shows a strong negative relationship with performance. Actually, the effect is so pernicious that it is multiplicative; for every one percent increase in the residual unexplained portion, scaled by Total Net Assets (TNA), the mutual funds’ performance decreases by over four percent. The authors believe that such a malign effect could be the symptom of deep agency problems: managers overcharging their expenses, trading unnecessarily just to generate the charges, etc. To discard the possibility of a spurious regression Edelen et al. (2012) take advantage of a change in the regulation that affects mutual funds and brokerage firms’ relationships. In 2004, the SEC stopped allowing mutual funds to bundle distribution
fees with other commissions. The authors create an event study around this change in regulation; if the strong negative relationship between performance and the residual fees is spurious and, actually other omitted variables are responsible for this phenomenon, then, the change in the legislature should be inconsequential and the effect of the residual commissions on performance should remain the same. Nevertheless, their empirical results show that the effects of residual commissions on performance disappear for the funds that are originally bundling them with other fees after the ban forces all mutual funds to report them separately. These results allow the authors to attribute the negative effect on performance to agency costs related to lack of transparency and low shareholder supervision. The agency problem concerns go even further, the authors also discover that distribution costs have a clear negative effect on flows when they are reported transparently but not when they are bundled, i.e. not included in the prospectus, and therefore are being charged without customers’ knowledge. These results suggest that managers have actually an incentive to hide their distribution fees and deceive investors into purchasing what they perceive as a fund with lower expense ratios. Given the possibility of malicious intent and the larger-than-parity negative effect of this opaque method to bundle commissions, the authors believe they have found evidence of agency costs and how important is to promote transparency in the mutual fund industry.

The same year, Iannotta and Navone (2012) try to explain the extreme mutual fund fee dispersion by controlling for heterogeneity among mutual funds. To isolate the sources of fee dispersion the authors try to control for funds’ differences, namely manager’s ability, investment objectives, funds’ age, assets under management, and fund’s family size. The last three mentioned characteristics try to account for what the authors call ‘fund visibility’; they are convinced that search costs also play an important role in fee dispersion. Search costs can be reduced through marketing efforts, thus 12b-1 fees are also included in the model. Using a panel dataset, they implement a heteroscedastic regression model, while clustering the residuals at the fund level, to increase robustness in the parameter estimation. Their model is capable of explaining forty percent of fee dispersion. The authors attribute the remaining unexplained fee
distribution to search costs, imperfect information and unsophisticated investors, who are more likely to pay fees at the highest rank of the spectrum. Their results support funds sharing part of their savings from economies of scale and economies of scope, measured by the size of the mutual fund family, with investors. Contrariwise, older funds tend to charge higher fees. Iannotta and Navone (2012) find that investors that stay in funds after poor past performance usually tend to pay higher fees, maybe as a consequence of lack of financial sophistication and their desire to avoiding costly searches. Their findings partly support their search cost hypothesis: more visible funds can afford to charge more to unsophisticated investors who do not want to incur in expensive searches. The same intuition can be applied to explain higher fees related to funds that charge 12b-1 fees. However, Iannotta and Navone confirm that higher average fees do not necessarily translate into wider fee dispersion. The authors pinpoint that fee dispersion decreases in relationship to assets size under management at the fund and family levels, and also marketing expenses, measured by loads and 12b-1 fees (Iannotta & Navone, 2012).

Sirri and Tufano (1998) first introduce the relationship between search costs and mutual fund fees. Tufano dedicates several of his early studies to research mutual funds’ fee structure. Sirri and Tufano (1998) follow the flow of capital into mutual funds and find mutual fund investors have a strong preference for funds that have performed well during recent periods and also towards funds that receive more media attention. They also highlight the importance of fees intended to support marketing efforts as an important tool to increase fund visibility. The authors analyze around 690 funds from 288 families for almost two decades, from 1971 to 1990. They model search costs in the mutual fund industry as economists would analyze the purchase of any large ticket item. In their opinion there are certain quantifiable aspects that are going to inform the investment decision, for instance, performance and expenses. However, the authors also believe that family name and recognition also play an important role in the investment decision in the presence of search costs. Sirri and Tufano arrange multiple regressions following a Fama and McBeth (1973) methodology. In several of their models they disregard
sophisticated measures for risk and return and prefer the measurements that are most likely used by actual retail investors. With this approach, the authors try to gain insight into investors’ behavior. Their findings confirm that investors chase past positive performance, especially towards funds with high fees, which are most likely to advertise their performance; conversely, investors are not as active in terms of fleeing the funds with poor past returns. It is less clear how investors react to expense ratios. Mutual fund customers leave funds with higher expense ratios but overlook loads. Sirri and Tufano think that financial advisors favoring the sale of load charging funds to cash incentives is behind investors’ disregard for loads. In terms of search costs, the evidence regarding media coverage is not as strong as the authors anticipate, it could be the result of the proxies used, which do not distinguish between positive and negative news. Finally, they also consider the impact of having a strong family name; for instance, they find that the spillover effect help funds in the same family as the top performing funds (Sirri & Tufano, 1998).

The structure and role of mutual funds’ board of directors have been largely ignored by the financial literature. There is a notable exception, the work of Tufano and Sevick (1997). The authors identify the possible conflict of interest inherent to mutual funds’ boards of directors. Mutual funds’ boards have the fiduciary responsibility of approving most fees charged by their family or sponsor. The independence of these directors comes into question given that they are elected by the same parent company that the board is supposed to monitor; also, according to the authors, directors are paid handsomely to minimize the fees charged by sponsors, their indirect employers. Under the Investment Company Act of 1940, which regulates the functioning of mutual funds, the directors in the board are the only direct employees of the fund; they then are in charge of outsourcing all the funds’ activities. However, mutual fund families select the independent directors that serve on mutual fund boards. Among other things, the 1940’s Act requires having at least 40 percent independent director in the boards. Similarly, it makes mandatory the yearly renewal of contracts; a majority of independent directors is required to pass managers and distribution fees. The law is believed to be necessary because investors are
not prone to switch mutual funds when fees rise due to the lack of financial literacy and the expenses involved in switching funds (mainly redemption fees and capital gains taxes). To derive their model, Tufano and Sevick (1997) manually collect information from approximately 1,500 individual mutual funds, belonging to 50 families, comprising about 70 percent of the mutual funds’ assets, during one year, 1992. One of their variables of interest, independent director compensation, is included in the SAI in aggregate terms; non-independent director compensation is not reported. One of the challenges the authors face is how to best utilize this piece of information given that they have characteristics of the individual directors but no individual compensation. After a preliminary assessment of the data, the authors realize that most fund families have unitary boards, i.e. use the same independent directors across all their funds. Thus, they decide to divide the aggregate director compensation by the number of directors, instead of by the number of boards or funds. To analyze the data Tufano and Sevick (1997) implement several models. Since they are using cross-sectional data, they count with many observations but extracted from a single year, the number of statistical tools available is limited. Their approach includes a standard Ordinary Least Squares (OLS) regression and several models clustering observations at the sponsor level or by their assets. They also use the Fama and McBeth (1973) approach, averaging funds by investment category instead of year, and a Fixed Effect (FE) regression that groups by families instead of years. The authors recognize all of these methodologies have significant deficiencies; however, they offer surprisingly homogeneous results. Using total sales charges as the dependent variable their models confirm the existence of economies of scale at the fund level. The impact of funds’ age contradicts other studies previously mentioned, with older funds charging higher fees. The authors interpret this result as a consequence of more established, popular funds charging higher fees and younger funds receiving subsidies from their sponsors. Past performance, measured in one, three, and five-year lapses have no impact on fees. With respect to the impact on performance of corporate governance, approximated by mutual fund boards characteristics, the results largely validate similar findings reported in the prior financial literature, regarding industrial corporations. The size of the boards is positively related to the level of fees charged; endorsing the idea of smaller boards being more focused and
effective. The proportion of independent directors also impacts the expense ratio; boards with a higher number of independent directors negotiate lower fees. Finally, directors’ compensation can also be traced in the fees paid by investors; however, the impact is not as significant as on the other two corporate finance measures. Still, directors with comparatively higher salaries are more likely to approve higher fees (Tufano & Sevick, 1997). However, the authors recognize serious data and methodology limitations in their research. The authors mention several directors’ attributes (for instance directors’ age, tenure, or fund ownership) that they wish they could include and that would have probably impacted their results, and were not available through Lipper Analytical Services at the time. I manually collected them and include them in my research. Also they only have data for one year, which seriously limits the methodologies that they have available to use. As it is explained in the data section, I am using two datasets, one of them with a 17-year time period, so I am be able to use more complex dynamic panel techniques, which to a certain extent help me overcome some of the challenges mentioned by Tufano and Sevick (1997).

Another topic that is at the core of this dissertation, brokerage commissions, has not gathered much attention in the financial journals. One of the most detailed studies I could find, Blume (1993) focuses on soft dollar compensation. Soft dollar brokerage commissions are defined as a payment in the form of research returned in exchange for contracting brokerage services. Soft dollars are considered a marketing tool and a premium service offered by service dealers. Brokerage firms compete for order flow and some of them are willing to return part of the commissions they charge to attract more transactions. Soft dollar compensation is regulated in the 1975 Section 28(e) Amendment to the Securities Exchange Act of 1934. Lobbyists’ efforts avoided the original intent of the amendment to require minimizing brokerage commissions and to limit research payouts. The amendment also requires the SEC to define what is considered research, which still remains ambiguous. Research payments in the form of soft dollar compensation have sometimes included lavish trips, parties, electronic devices, and other perks with little relation to investments. Several scandals have reshaped the definition of what constitutes research
multiple times to circumvent abuses. Blume’s (1993) study is based on survey-type data, and also uses an exclusive dataset provided by Abel/Noser. Abel/Noser is a New York based brokerage firm that specializes in analyzing institutional investors’ trading costs. The survey type data was mailed to investment managers in charge of portfolios larger than $100 million. It spurred over 400 useful returned questionnaires. According to the results of the survey there are three types of soft dollar compensation: direct in-house research provided by the brokerage firms, third party research financed by the brokerage firms in exchange for the order flow, and other research payments (including computer software and hardware, training, clerical support, etc.). The self-reported results from the survey indicate that the most common types of research requested include fundamental analysis, earnings forecast and macroeconomic trends. The answered questioners also provide evidence of the impact of the soft dollar compensation on the order flow. About one third of the respondents recognize that one third of the trades are directed through a broker that they would normally not use just so they can qualify for soft dollar research. According to the returned surveys the type of trades directed through service brokers that provide soft dollar compensation is different from the trades directed though capital brokers, which do not engage in soft dollar trading. It is only the easiest trades, usually smaller and not strategic, that involve soft dollar-paying brokerage firms. The trading records provided by Abel/Noser confirm this pattern. The complexity of the trade is measured using different variables: size, relative volume, standard deviation of the firm returns, and price impact. Under all these different measurements, capital brokers, instead of service brokers, execute the most complex trades. The main advantage of capital brokers is that they consistently commit capital and take short-term positions to facilitate trades. The surveys also ask investment managers to weight in on the quality of the services provided. Soft dollar research is one of the most valued attributes of a satisfactory trade; only second to the commitment of capital to facilitate a trade. Most respondents also oppose any regulation that might limit the extent of soft dollar usage. Thus the empirical data and the survey responses confirm the importance of soft dollar trading, which under some accounts was estimated to account for 40 percent of the institutional trading in 1989 (Blume, 1993). In my sample, approximately 33 percent of mutual funds admit using service brokers firms, which offer
soft dollar compensation, and soft dollar brokerage commissions account for 19 percent of all brokerage commissions in 2015 (please refer to table IV, for the panel dataset descriptive statistics). Soft dollar trades are also a cost difficult to quantify by mutual funds customers, since managers discard competitive brokerage fees in favor of special services or research despite having to pay a premium rate. Ignoring soft dollar premium commissions underestimates the costs of actively managed mutual funds and might accentuate agency problems given the difficulty to monitor such decisions. Nonetheless, Horan and Johnsen (2004) find that the premium trades associated with soft dollar compensation are linked to superior risk-adjusted performance and to higher managerial compensation, approximated by management fees. The authors in their final conclusions interpret such results as a confirmation that soft dollar brokerage is a solution to agency problems (Horan & Johnsen, 2004).

Prather et al. (2004) try to empirically decipher the determinants of mutual fund performance. The authors depart from the lack of unanimous findings in the prior financial literature regarding mutual fund performance. They believe that the contradictory prior empirical results are a consequence of methodological flaws. These flaws are partly caused by the existence of survivorship bias in the samples used and also by problems defining a proper benchmark. Ill-defined benchmarks provide performance measurements that are not properly risk-adjusted. One of the main findings enunciated in the prior literature and cited by the authors, is the possibility of performance persistence, which could be interpreted as a violation of the efficient market hypothesis. To circumvent the common problems mentioned above, the authors avoid narrowly focusing only on a few determinants, and include over twenty-five independent variables. Moreover, they use a much larger survivorship bias free dataset, which has over 5,000 equity funds during the period 1996-2000. Their numerous independent variables are grouped in four broad categories: growth, popularity, expenses, and management. The growth category is expected to have a positive impact on performance; it includes: common price ratios, used as proxies for growth opportunities, and also alternative measures for risk such as diversification and beta. The popularity measures are linked to demand for the fund; including past performance, and relative size.
of the assets under management. The expense variables measure the fund’s costs; the authors expect mutual funds’ expense ratios to have a positive impact in fund performance, when most of these expenses are devoted to support research and to compensate for management effort. Finally, the management category is intended to capture the effect of how the fund is organized and how it operates. The summary statistics reveal several interesting facts, the enormous growth in the mutual fund industry is parallel to: an increase volatility, a reduction on the average fund age, and important changes in the way mutual funds are managed. In particular, the number of funds managed by each management team or individual manager has rapidly increased; furthermore, funds overseen by individual managers are becoming extinct while management teams are becoming more popular. Using a comprehensive methodological approach and an extensive dataset the authors attain revealing results. Investment objective emerges as one of the most important determinants of fund performance. In particular, funds that invest in small firms show superior performance; also regarding investments in small capitalization firms, when the funds reach a certain size they cannot continue to pursue the same investment objectives that made them successful in the past and that affects their prospects of future performance. Consequently, Prather et al. (2004) find mean reversion patterns in mutual fund performance instead of persistence. The effect of expenses on fund performance is consistent with the prior literature; funds with high expense ratios tend to underperform; fees are not used to increase research and managers tend to be overcompensated relative to the level of fund performance they achieve. Furthermore, the trend to increase the number of funds under one management team or individual manager is only intensifying the perverse effects of funds’ fees; as the number of funds that managers supervise increases, their performance suffers (Prather, Bertin, & Henker, 2004).
III. Hypotheses

There are few topics that reach general consensus in the mutual fund financial literature; the inability of investors to minimize mutual fund fees, and therefore maximize portfolio returns, is one of them. Such suboptimal behavior could open the door to agency problems. Agency problems tend to be more severe in the presence of asymmetry of information. Since mutual fund managers have superior knowledge about the functioning of their funds and the resources required to support their investment strategies, it is reasonable to assume asymmetric information in the mutual fund industry between customers and mutual fund managers. There are also implications for the efficient market hypothesis derived from mutual fund returns. I am devoting my attention towards two important and mostly ignored components of mutual funds’ expenses: brokerage fees and executive compensation. In the executive compensation literature, is usual to discuss the possibility of agency problems. Management fees constitute a large portion of mutual funds fees and are mainly designed to compensate mutual fund managers for their contribution to these investment vehicle performances (Malkiel, Asset Management Fees and the Growth of Finance, 2013). In my cross-sectional sample, management fees take up to 44 percent of expense ratios in 2015 (Table II). Simultaneously, I focused my attention on brokerage commissions and ‘soft dollar’ compensation. There is also a possible conflict of interest in this setting, mutual fund managers are not required to minimize brokerage fees; thus, they might be following a rent seeking behavior. Soft dollar compensation exists because mutual fund managers are not required to trade at the most competitive bid, since they can receive other types of services from brokerage firms in exchange for order flow. Alternatively, soft dollar commissions might reduce mutual fund expenses if the brokerage firms can provide research at a more efficient cost than the mutual fund’s own research department. Additionally, soft dollars compensation may reduce management fees since management fees cover portfolio’s manager compensation, research and operating expenses, and profit sharing (Morningstar Fund Research Group, 2011). I am able to clarify the relationship between corporate
governance structures in place and the level of mutual fund brokerage fees, yet contemplating the possibility of a conflict of interests as a feasible explanation.

**Hypothesis I:**

Funds with stronger corporate governance structures in place should present smaller brokerage fees, controlling for other possible mutual funds’ characteristics that the financial literature has found influential in regards to brokerage fees.

$$\text{Brokerage Fees}_{it} = \alpha_{it} + \beta_1 \text{Fund Characteristics}_{it} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Fund Turnover}_{it} + e_{it} \quad (1)$$

**Hypothesis II:**

Funds with higher expense ratios would tend to also have higher brokerage fees, after controlling for other factors that the financial literature has found to influence mutual fund expenses.

$$\text{Brokerage Fees}_{it} = \alpha_{it} + \beta_1 \text{Fund Characteristics}_{it-1} + \beta_2 \text{Expense Ratio}_{it-1} + \beta_3 \text{Fund Turnover}_{it} + e_{it} \quad (2)$$

Mutual fund’s brokerage fees have not been tackled by the financial literature nor have their possible relationship with corporate finance ever been explored. Thus far, with two significant exceptions, the financial literature has mostly focused on the relationship between performance and fees, ignoring the possible role of corporate governance. One exception is Tufano and Sevick’s (1997) work; the authors identify the potential conflict of interest at the core of mutual funds’ boards of directors. Directors are closer to the funds’ family or sponsors than they could ever be to the fund investors, who they most likely never get to meet. The authors confirm the impact that generally accepted proxies of
corporate governance have on mutual fund charges. Additionally they also iterate fund scale as a fee reduction mechanism while proving once again that high fees are not a signal of good performance (Tufano & Sevick, 1997). Additionally, Adams’ et al. (2012) research is worth mentioning; they present the idea of excessive mutual fund fees; this notion has since then has trickled down into the practitioner side. The authors, using manually collected data, highlight the role of poor corporate governance as a catalyst for large mutual fund fees. In their view, publicly held mutual fund families with weak corporate governance use multitude of share classes to disguise higher fees. The authors suggest agency problems, due to the conflict of interest between the publicly held sponsors managing funds and the mutual funds’ customers, as a possible explanation for the link between higher fees and poor corporate governance (Adams, Mansi, & Nishikawa, 2012).

Hypothesis III:

Higher executive compensation, controlling for other possible characteristics that influence compensation according to the prior financial literature, is prone to appear in mutual funds with weaker corporate governance structures in place.

\[
\text{Dir. Comp}_{it} = \alpha_i + \beta_1 \text{Dir. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \tag{3}
\]

\[
\text{COB Comp}_{it} = \alpha_i + \beta_1 \text{COB Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \tag{4}
\]

\[
\text{Mngr. Comp}_{it} = \alpha_i + \beta_1 \text{Mngr. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \tag{5}
\]
Hypothesis IV:

After controlling for other influential factors, funds with higher expense ratios will tend to, on average, pay higher salaries to their executives.

\[ \text{Dir. Comp}_t = \alpha + \beta_1 \text{Dir. Comp}_{t-1} + \beta_2 \text{Fund Characteristics}_{t-1} + \beta_3 \text{Expense Ratios}_{t-1} + e_t \quad (6) \]

\[ \text{COB Comp}_t = \alpha + \beta_1 \text{COB Comp}_{t-1} + \beta_2 \text{Fund Characteristics}_{t-1} + \beta_3 \text{Expense Ratios}_{t-1} + e_t \quad (7) \]

\[ \text{Mngr. Comp}_t = \alpha + \beta_1 \text{Mngr. Comp}_{t-1} + \beta_2 \text{Fund Characteristics}_{t-1} + \beta_3 \text{Expense Ratios}_{t-1} + e_t \quad (8) \]

I expect to find similarities between the determinants of mutual fund manager compensation determinants and the main factors affecting CEO compensation enunciated by the financial literature. This parallelism strikes from potential agency type conflicts and the existence of asymmetry of information. The previously mentioned literature highlights one of the main problems derived from mutual fund fee structure: mutual fund fees are the substance of mutual fund profits at the expense of mutual funds’ customers. Mutual funds fees and mutual fund profits are maximized when the sheer amount of assets under management increases (Golec, 2003). This goal can be achieved in many different ways: for instance, by enhancing portfolio performance using superior market timing and portfolio investment skills, but also by recruiting new customers or getting existing ones to invest more money through marketing efforts. Directors approve all mutual fund fees, including management fees, which should be representative of the services provided in return by fund managers. If mutual funds’ management fees are not shaped by managers’ investment skills, as reflected by portfolio performance, but are more influenced by the volume of assets under their management, then, the incentive systems put in place by the lobbyist efforts of mutual fund parent companies, may have a perverse effect on investors.
Hypothesis V:

Poor mutual fund performance could be linked to higher fees such as brokerage commissions or generous executive compensation, after considering other possible determinants of mutual fund fees identified by the mutual fund financial literature.

\[
\text{Performance}_{it} = \alpha + \beta_1 \text{Comp}_{it} + \beta_2 \text{Expenses}_{it} + \beta_3 \text{FundCharacter}_{it} + \beta_4 \text{CorpGovern}_{it} + e_{it} \quad (9)
\]

My fifth hypothesis addresses the effect of corporate governance, managers’ and directors’ compensation, brokerage fees, and other expenses, controlling for other possible influential factors, on performance. A detailed explanation of alternative potential variables to measure performance and the independent variables can be found in the data section below. The works of Malhotra and McLeod (1997) and Golec (2003), pioneers identifying the determinants of mutual funds fees, inform the selection process for the control variables. It is reasonable to expect that several of the characteristics that affect expense ratios or mutual fund performance also have an impact on brokerage fees and to a certain extent on compensation. For instance, as suggested by both articles, mutual fund size is included as a control variable and 12b-1 fees as an expense variable of interest. Iannotta and Navone (2012) also confirm the importance of economies of scale and marketing charges in their empirical study. Bringing brokerage fees and return together early on, Grinblatt and Titman (1998) link mutual fund performance with turnover rates. Higher turnover rates, which translate into higher brokerage commissions are directly related to positive abnormal mutual funds returns. The authors believe this is a consequence of turnover ratios reflecting the ability of mutual fund managers to develop investment strategies that result in portfolio growth and consequently on higher manager fees or higher manager compensation (Grinblatt & Titman, 1989). Furthermore, Delva and Olson (1998) share specific types of mutual fund fees that actually help to predict positive abnormal returns. The authors establish that certain funds’ charges might be beneficial to customers because they actually make mutual funds more efficient, allowing them to reduce overall costs and improve performance (Delva & Olson, 1998). Delva and Olson (1998) are
referring to 12b-1 fees and redemption fees; however, a similar argument can be made for brokerage fees and soft dollar compensation. Part of the findings derived from testing this hypothesis clarifies the association between fees and performance.

IV. Data

While several datasets provide mutual fund information nowadays, to gain a larger insight on the effect of corporate finance in mutual funds’ organization, their fee structure and the way they are managed, I decided to extract many key characteristics from the mutual funds’ Statements of Additional Information (SAIs). Mutual funds must provide the SAI at investors’ request and have to file them yearly with the SEC. The SAI is a more detailed version of the prospectus that further expands into the fund’s investment policies, director and independent COB characteristics, commissions, fees, etc.

My manually collected data is obtained from two SEC filings: the SAIs and the prospectus, which are part of the 497 and 485 filings, respectively; both are obtained through the Electronic Data Gathering, Analysis and Retrieval (EDGAR) database. Funds supply the SEC with the prospectus and the SAI, once a year unless significant changes occurred, in which case they issue a notification of the changes, and in some cases an updated version. The yearly filings determine the frequency of the data; most of the variables used in this study are yearly. There is not much homogeneity in the way the information is filed. All funds must include the minimum required information, but there are funds that provide additional information. The way information is allocated between the SAI and the fund prospectus also varies from fund to fund. Additionally, several mutual fund families provide individual prospectuses and SAIs for each fund, while others group many funds under the umbrella of one unique SAI. This heterogeneity only complicates the task of manually collecting data for the researcher, since the source and type of information varies from fund to fund. Furthermore, with respect to COB and director
compensation most funds report the information in aggregate terms, which somewhat limits this analysis. As noted before during the literature review Tufano and Sevick (1997) already faced a similar situation. The authors device and strategy to circumvent this problem, after realizing that most fund families employ the same set of directors to sit on every board, they decided to divide aggregate compensation among directors. Still, certain subtleties are lost from the analysis given the limitations caused by dealing with aggregate instead of individual compensation. Furthermore, the fact that information in certain prospectuses and SAIs are provided at the family level instead at the individual fund level raises a concern and brings back the debate regarding how mutual fund fees are set. The conflicting views originate from the possibility that fund fees are determined at the family level instead of at the individual level (Iannotta and Navone, 2012).

Keeping in mind that the main focus of this study is to trace the impact of corporate governance measures on brokerage fees, boards’ and managers’ compensation, the SAI and the prospectus are the only sources of the information required to construct the variables. Specifically, director information gathered for this dissertation includes: director compensation in both individual and aggregate terms, the total number of directors in the board, the number of independent directors, the number of female directors, etc. Mutual funds are required to report to the SEC this information in regards to only independent directors but not on interested directors; hence, the focus of this research is on independent directors. Under the Investment Company Act of 1940, directors are either classified as interested or independent. To qualify as an independent director, an individual cannot be a five percent shareholder, or an employee, of the mutual fund family, a registered broker-dealer, cannot be an immediate relative of a mutual fund family employee, or have an affiliation with any recent legal counsel to the fund. It is also noted before that mutual fund industry boards are extensively regulated and that the Investment Company Act of 1940, requires boards to have at least 40 percent of independent directors. There is also other information regarding directors that I collected: the number of portfolios overseen, the amount (reported as a range) invested in the funds within the mutual fund family, and personal characteristics. The
personal information collected is age, gender, tenure, education, and prior occupation. The number of committees, the composition of the committees, the number of board meetings, the number of committee meetings, and the meeting fees are also collected for this dissertation.

Simultaneously, information is collected in regards to mutual funds’ independent COBs. There is even more information regarding independent COBs than there is available for independent directors. Within the SAI, all mutual funds disclose COB compensation in individual and aggregate terms. In addition to COB compensation I collected the range of portfolio holdings in the multiple funds of the family, number of funds overseen, etc. and several COB characteristics such as: gender, age, tenure, education, prior occupation, etc.

All mutual funds are required to disclose their management fees, which include management compensation and other expenses. Unfortunately, there is no alternative data source to obtain a more distilled version of managers’ compensation. Hence, in this research I have used management fees as a proxy for fund managers’ compensation. Golec (1996) was aware of the limitations of using management fees to approximate managerial compensation; management expenses include not only managers’ compensation but also other expenses that are related to the kind of work developed by managers in a mutual fund. Included in the management charges are research support, operating expenses and profit sharing. Golec makes the argument that even though management fees are contaminated with other elements, still higher management salary is accompanied by higher fees, and goes ahead and utilizes management expenses in place of managers’ compensation for his study (Golec, 1996).

After reading a few examples of mutual fund prospectus and SAIs, one of the most striking elements are the wordy disclosures that precede brokerage commissions. This disclosure indicates that financial managers are not required to minimize brokerage fees and have complete freedom when choosing a brokerage firm to conduct a transaction. The reason why they are not required to minimize brokerage fees is because in return for order flow financial managers could receive a reimbursement
These reimbursements are commonly known as soft dollar compensation. Soft dollars must be primarily used for research purposes; however, the definition of research is ambiguous. Furthermore, when it is revealed, I also collected the amount of brokerage fees that are channeled through brokers that provide research services, known as soft dollar compensation. Here is where one can find potential agency problems as a consequence of asymmetric information. Furthermore, management fees are interconnected with brokerage fees because the investment manager selects the broker-dealer for the transaction. For instance, the Washington Mutual Investors Fund’s SAI states that when transacting with a particular broker the investment manager must ensure the ‘best execution’. The best execution is characterized as ‘a process that should be evaluated over time as part of an overall relationship’ and must regard ‘price, service and qualitative considerations’ (Washington Mutual Investors Fund, 2013). Nevertheless, the role of the fund manager goes well beyond selecting the brokerage firm and ensuring the best execution. Mutual funds are independent legal entities ruled by directors and owned by customers. However, new mutual funds are often created by parent companies, which then select the initial mutual funds’ board of directors. In return, the board of directors contracts most services with the sponsor firm that in fact manages the fund (Adams, Mansi, & Nishikawa, 2012). After such a close relationship between the board of directors, the fund manager, and the parent company, one needs to contemplate a potential conflict of interests and question the capacity of the board to negotiate competitive fees and of managers to consider the best transaction costs for the mutual funds’ customers.

The manually collected data is combined with entries from the Center for Research in Security Prices (CRSP) Mutual Fund Free Survivorship Bias Database, which provides comprehensive information on open-ended mutual funds free of survivorship bias. It includes daily and monthly observations but primarily it is annual data on mutual fund characteristics, including: investment objective, TNA, Net Asset Value (NAV), management fees, expenses, etc. Prather et al. (2004) believe that an important deterrent to unanimous findings in the mutual fund financial literature strikes from the pernicious effect of using datasets that have been not been adjusted against survivorship biases. The
authors say their dataset stands against survivorship bias because they merge individual Morningstar Principia Pro Dataset yearly files from 1996 to 2000, and they are adamant about including small young funds, active for less than three years, in their sample. Joining the latest yearly Morningstar datasets together partly corrects the survivorship bias problem because every year Morningstar deletes retroactively the prior observations from any defunct fund. Even though the Morningstar dataset limitations are common knowledge, it has been the traditional source for mutual fund information. Given the surge in interest in this area of financial research, CRSP launched the CRSP Mutual Fund Free Survivorship Bias Database in 1998 to tap into this new research area while hopefully addressing the limitations of the Morningstar set. The original CRSP mutual fund database started in 1995, as manually collected data for Mark M. Carhart’s dissertation, with financial support provided by Eugene F. Fama and CRSP (CRSP, 2014). One of the resulting papers from Carhart’s dissertation, Carhart (1997), which focuses on persistence in mutual fund performance, is cited in many of the papers used in this dissertation’s literature review and remains relevant today. While the CRSP mutual fund database is becoming the industry standard for mutual fund related research in finance, this source is not free of imperfections. Elton et al. (2001) are also versed in the task of hand-collecting mutual funds data. In their article, the authors analyze the accuracy of the new CRSP dataset while comparing it with its Morningstar counterpart. Their findings reveal numerous missing records in the CRSP dataset causing an omission bias. I also found several omitted mutual funds when I was individually assigning CRSP fundnos, the unique CRSP mutual fund identifier, to my manually collected dataset. Alternatively, when fundno did not match, I tried to merge the entries using the mutual fund’s name, or ticker symbol, but there were a few instances in which I was not able to include the funds from my sample because I could not find a match in CRSP. In all the instances this happened the fund had been only in existence for one or two periods before disappearing. Perhaps they were never added to the CRSP mutual fund dataset because they were short lived. I sent an email to CRSP customer service notifying them of the omissions. Elton et al. (2001) believe the omission bias found in the CRSP mutual fund dataset may have similar
consequences to a survivorship bias, such as the one present in the Morningstar base. According to the authors, the omissions result in upward biases in performance (Elton, Gruber, & Blake, 2001).

In this dissertation, the length and time horizon of the study, in terms of number of periods and number of mutual funds, which determines the number of unique fund and year combinations, is defined by the scope of the manually collected SAI filings. I was able to secure two different datasets to combine with the CRSP Mutual Fund Free Survivorship Bias Database, which allows me to test for all of the hypotheses that I introduced in the prior section. First, I garner over 2,800 unique year-mutual-fund individual observations over 17 years, covering the period 1998 – 2015; this averages to approximately 165 mutual funds per year. The mutual funds selected for this panel dataset are domestic equity and fixed income funds. The funds belong to 16 different families. To assess possible commonalities shared by funds belonging to the same family, several statistical analysis performed in this dissertation cluster the observations by their family membership. One hundred funds starting on the year 2000 are selected from several sources that compiled the best and worst performers at the turn of the century. The largest 100 funds of the year 2000 are purposely not selected for this sample; I seek the best and worst performers for a wider representation of funds. I went back two years from 2000 to include fund information from the year 1998. Setting 1998 as the beginning year is influenced by many CRSP variables, which became available that year. The sources for the best and worst performing mutual funds at the turn of the century are mostly practitioner outlets including: *The Wall Street Journal, Forbes, Reuters, Wise Bread,* *Kiplinger, U.S. News and World Report,* and *Morningstar* (Williamson, 2000; Widows, 2007; Hawkins, 2009; Espinoza & Constable, 2014; Kiplinger, 2014; Lemke, 2015). Around the year 2000, given that it marked the beginning of a new century it was common to create mutual funds’ rankings. I also found several articles that look back at the best or worst performers 10 or 15 years from the time they were written to follow up how they fared. This dataset includes, among other information, mutual fund corporate governance characteristics: board size, number of independent directors, number of female directors, independence of the Chairman of the Board, number of board meetings, pecuniary meeting fees,
director compensation, yearly brokerage fees, etc. Simultaneously, the second dataset that I compiled is more ambitious in the number of mutual funds included. However, such extended scope limited the time period to the most recent fiscal year at the time of this writing, 2015. Therefore, I created one cross-sectional dataset recording information from over 1,280 individual mutual funds just for the year 2015. The individual fund observations are extracted from 37 different families. In order to give the reader a sense of the level of concentration in this cross-sectional sample, the most widely represented families in this sample, in decreasing order, include 84, 80, 78, 72 and 60 funds. Both datasets include the same parameters, featuring a categorical variable that identifies if the mutual fund family is publicly or privately owned; information that is not included in the 485 of 497 filings with the SEC. One of the data sets allows for horizontal or cross-sectional analysis of the data, and the other one facilitates the implementation of more complex panel data techniques, designed to deal with vertical datasets and inter-temporal changes. The different methodologies are discussed in the next section of this thesis.

Immersing into the SAI also allows me to obtain valuable information regarding the corporate governance structure of the fund. The CEO literature has managed to identify the links between managerial compensation and corporate governance for industrial organization. With the exception of Tufano and Sevick (1997), the mutual fund literature has not paid as much attention to this task. The SAI has detailed information about board composition, fund policies, and attributes. Hence, the objective of this research is to understand the role of corporate governance within the mutual fund industry and its effects on brokerage fees and mutual fund managers’ and directors’ compensation. Ideally this process clarifies the impact of corporate governance on mutual fund fees, which several authors within the financial literature have identified as one of the major links to poor performance in the industry and probably one common manifestation of market inefficiency (Freeman, Brown, & Pomerantz, 2008; Adams, Mansi, & Nishikawa, 2012; Iannotta & Navone, 2012; Dvorak & Norbu, 2013; Brown S. L., 2017).
IV. i. Cross-sectional Descriptive Statistics

Table II summarizes the descriptive statistics for the cross-sectional sample of 918 individual mutual funds for the year 2015. The table includes: mean, median, standard deviation, maximum, and minimum values for all the mutual funds’ characteristics, expenses, and corporate governance traits that participate as control variables and explanatory regressors in any of the statistical models used in the analysis of the five hypotheses stated in this study. My cross-sectional sample size corresponds to approximately 15 percent of the entire population of mutual funds by the number of observations. According to the Investment Company Institute (ICI), in 2015 the number of mutual funds broke again the 8,000 mark, a threshold that has not been reached since the beginning of the Great Recession in 2008. Specifically, 8,116 mutual funds are reported last year, a healthy number that is the result of 594 new mutual funds entering the market during 2015 (Investment Company Institute, 2016).

The descriptive statistics table starts with several of the main control variables that have been largely incorporated in prior studies. Table II reports that, on average, total net asset are $2.39 billions, in my hand-collected dataset and the median fund’s size accounts for $220.35 million. Both figures reaffirm the representativeness of the sample of funds I collected since these values are consistent with levels provided by the ICI for the year 2015 and in prior studies identified in the literature review. For instance, Edelen et al. (2007) reports TNA values of $2.9 billion and $497 million for the average and median fund respectively. The NAV in my sample is at $24.42 per share, with a median value of $13.01 per share; both numbers resonate with previous studies. Prather et al. (2004) reports NAV of $25.02 for their median fund.

A recent article published by Barron’s championed four mutual fund managers that have been capable of outperforming their benchmarks consistently over the long term. In fact, over the last 25 years
less than half of mutual funds’ managers have been capable of outperforming the S&P500 in any given year, which is less than what would have been predicted by chance. The lack of consistency in returns indicates that those managers who get to outperform their benchmark are probably relying on statistical probability not skill (Norton, 2016). In 2015, the annual return on the S&P 500 is 1.38 percent; the median return from the 918 mutual funds from my sample for that year is a much more dramatic negative 4.82 percent, confirming the persistence of disappointing professional manager performance. Maybe a consequence of lackluster returns, mutual funds see withdrawals surpass new purchases during that year; outflows coming from the funds, surpass inflows going into the funds in 2015 by almost 0.2 percent for the median fund, which translates to average net redemptions of $43 million given the size of the median fund in my sample. Finally, in regards to other specific characteristics of the funds from my cross-sectional sample, the average fund has been active for 15 years with a median fund life of 12 years, while the median manager has led the fund for six years, very close to the 6.95 years in service for the average managers reported by Golec’s (1996) descriptive statistics.

Following the main mutual fund characteristics used as control variables in the regression models are the expenses accrued by the mutual funds in my sample during 2015. The median mutual fund accrues an annual expense ratio of 0.9 percent of total net assets to its customers. This amount is substantially less than the median values of 1.23 percent and 1.44 percent obtained by Edelen et al. (2007) and Prather et al. (2004) respectively. The lower median expense ratio from my sample may reflect that approximately 30 percent of my sample consists of index funds and the overall reported tendency of mutual funds to reduce certain fees now trending in the industry (Malkiel, 2013; Kinzel, 2014). Examining the expense ratio for the median fund, I find that the cost scheme is distributed as follows: over 60 percent of the charges are allocated to management fees, with another 25 percent taken by 12b-1 fees, and the remaining 23 percent going to miscellaneous expenses. Golec (1996) reports management fees of close to 50 percent of the expense ratio, while Prather’s et al. (2004) descriptive statistics lists average 12b-1 fees at 25 percent of total charges. Comparably, a distinctive variable introduced in this
study is at a similar level with respect to expense ratios: average brokerage commissions sum up to 15 percent of expense ratios. Further, turnover ratio, a decisive driving force of brokerage commissions, accounts for 121 percent of the average fund portfolio and for 51 percent of the median portfolio in 2015, a departure from the Investment Company Institute reported mean turnover ratio of 86 percent in 2015 (Collins, Holden, Duvall, & Chism, 2016). The final expense captured by the 2015 cross-sectional descriptive statistics table is the level of cash remaining in the average portfolio, at 4.53 percent is almost half the 8.03 percent reported by Malhotra and McLeod (1997) in their sample of 238 funds for the year 1993.

The next section of the Descriptive Statistics table centers on board and independent director characteristics. All board related variables in table II are unique to this study and therefore should be discussed in detail. Average and median values indicate a board size of nine members, comparably a 2003 article from The Wall Street Journal, claims that the average number of directors per board is 9.2, reporting that seven has been traditionally being considered an ideal size (Burns, 2003). The Investment Company Act of 1940 requires that at least 40 percent of the seats on a mutual fund board are occupied by independent directors; in 2013, 90 percent of fund mutual funds families, independent directors occupy the majority of board seats, reaching nearly 75 percent of directorships (U.S. Securities and Exchange Commission, 2014). In my sample, the ratio of independent directors is even higher. The median board has almost 89 percent of independent directors, which occupy 83 percent of board seats, on average. Additionally, following the findings of Adams and Ferreira (2008) I also examined the representativeness of women in mutual fund boards. Females represent approximately 22 percent of the median board seats. In the realm of director characteristics, directors’ ownership of mutual fund shares is not reported in discrete terms but in increments. I created a categorical variable to represent the five existing director ownership categories, which go from none to four different brackets that range from $1 to $10,000 for the first interval and starts at $100,000 for the last one. Table II indicates that average director from my sample owns between $50,000 to $100,000, however, the median director owns no shares on any of the
funds in which he seats. Kinnel’s (2008) Morningstar research piece finds that, in general, mutual fund managers are not usually invested in the funds they manage; ownership ranges from approximately 50 percent for domestic equity fund managers to only 20 percent for managers in charge of municipal funds (Kinnel, 2008). In regards to other director’s traits, the Investment Company Institute, on its Overview of Fund Governance Practices report for the two decades ending in 2014, identifies several trends affecting mutual fund boards, including: an aging directors’ population, a dramatic surge in the average net assets overseen by directors by a factor of almost 20 times, a considerable increase in director pay, etc.

Moreover, the average number of funds overseen by independent directors more than doubled during the two-decade period ending in 2014, reaching 57 funds from 26 funds in 1994 (Investment Company Institute, 2015). The median independent director from my sample oversees 133 mutual funds, a number higher than the reported value in the ICI’s (2015) study, but consistent with the trends observed in the industry. Independent director compensation is another variable that is collected for this study; it is reported in two ways, per individual fund and also in aggregate terms for the entire fund family. The board’s compensation committee sets independent directors’ compensation. The Investment Company Institute’s (1999) Advisory Group on Best Practices for Fund Directors, regards the self-assignment of one’s own salary as a mechanism that guarantees the independence and effectiveness of the of the board of directors from the mutual fund sponsor and avoids conflicts of interests. Independent directors’ median compensation per fund is almost $1,900 and the aggregate median compensation paid to independent directors is $244,000. The compensation is in line with independent director compensation for publicly traded companies. In 2015, Steven Hall & Partners, an leading consulting and law firm for executive compensation, published a comprehensive study which identifies the median total compensation paid the prior year to independent directors at $142,313 for small-cap companies and at $276,667 for large-cap corporations (Steven Hall & Partners, 2015). Similarly, a recent The Wall Street Journal article identifies mutual fund independent directorship as one of most lucrative jobs, citing anecdotal evidence, the author mentions that compensation in mutual fund boards exceeds compensation at the highest paid S&P 500 firms’ boards of directors (Sterngold, 2014).
A second set of board characteristics unique to this study centers on independent chairman of the board traits. The median chairperson in my cross sectional sample is 59 years old. According to the Investment Company Institute’s (2015) Overview of Fund Governance Practices report, the average age of the independent director of the board has increased steadily since 1994, reaching an average of 66 years by 2014. Similarly, the recommended retirement age has been extended, and the mutual fund families with a mandatory retirement policy have also increased the threshold from 72 years in 1996 to 75 years in 2014. According to this study, the median number of years independent directors serve on the board has also increased from 9 to 12 years (Investment Company Institute, 2015). In my sample, the median number of years a COB has spent leading the board is eight, which is slightly lower than the reported values from the ICI’s (2015) study. On the contrary, the median COB is in charge of 133 boards, a figure that surpasses the 57 boards, on average, that are supervised by independent directors as established by the ICI’s 2015 report on Fund Governance Practices. As it is the case for independent directors, the median independent COB does not have any of his own capital invested in the mutual fund that he or she supervises. Besides, the average amount invested by the COB in the mutual funds he or she chairs is considerably smaller than the median independent director’s investment, with an estimated range between $1 and $10,000. Both independent COB compensation variables reported in this descriptive statistics summary for table II are only available for independent chairmen. As one would expect, both median and average compensation measurements are higher for independent chairmen than they are for independent director compensation. The median salary received by an independent chairperson from the mutual fund complex is approximately $346,000 and the median compensation received from individual funds amounts to over $6,300. This seemingly high compensation is also consistent with the Steven Hall & Partners’ (2015) report of board trends. According to this study the median additional premium paid to independent COB with respect to independent directors ranged from $50,000 for small cap to $200,000 for large corporations. During the 15 years prior to 2014, COB compensation increase by 19.6 percent, which according to the study is a larger average increase in total compensation than the one experienced by independent directors (Steven Hall & Partners, 2015).
The last set of board characteristics specifically-collected for this study centers on how the board functions. Part of the compensation paid to directors and chairmen of the board reported earlier is derived from payments made in lieu of serving on a board committee, both as members or chairperson, and from attending regular board’s and committee’s meetings. There is no statute or law that specifies the number of board meetings that must be held. However, manager fees, among other fees, must be approved annually at an in-person meeting by a majority of independent directors. The median board in my sample has four committees; most frequently these identify as: executive, audit, compensation, and nominating committees. The fact that the average number of committees in this cross-sectional sample is larger than four indicates that several mutual funds have more committees, perhaps reflecting certain aspects of their corporate culture or the specific challenges they face. The descriptive statistics in table II reflect this situation, the median number of committee meetings, 12, more than doubles the median number of board meetings. Comparatively, the Investment Company Institute’s (2015) Overview of Fund Governance Practices reports that 63 percent of mutual fund boards held four board meetings during 2014, an additional 28 percent of mutual funds reported between five and six general meetings of the board, and only six percent of the boards met seven times or more. The report also reveals that committee meetings are frequently held in the same dates as regularly scheduled board meetings. Furthermore, additional committee meetings are also arranged. Since 1998, the average number of committee meetings in which independent directors participated has increased steadily from five to ten (Investment Company Institute, 2015). According to Steven Hall & Partners (2015) small-cap firms are more prone to award meeting fees and to pay fees for servicing in a committee, which also may entail more compensation in the form of committee meetings’ fees. Independent directors supplement their salary by serving on multiple board committees and by attending meetings. From my 2015 cross-sectional sample, the median meeting fee for 2015 is $7,500, which is considerably high compared to the values reported in the Steven Hall & Partners (2015) study. The law and consulting firm notes that large-cap companies are eliminating meeting fees in favor of higher annual cash or equity retainers; as a result average meeting fees are
declining. In their report, the median meeting fee for 2014 is $2,000 for large-cap firms (Steven Hall & Partners, 2015).

IV. ii. Cross-sectional Correlations

[Insert Table III here]

Pearson’s product moment correlation coefficients are run across all 35 cross-sectional variables in table III and include control, expense, and corporate governance variables. Statistically significant correlations (p<0.05) with moderate to high strength (| r |>0.50) are interpreted below starting with control variables.

None of the seven control variables: TNA, family identifier, investment objective, annual return, fund flow, fund life, or institutional flag show a significant moderate or strong correlation to one another. However, one control variable is moderately to highly correlated with an expense variable and two corporate governance variables (Table III); all are statistically significant correlations. Expense ratio, the percentage deducted from total assets every year to cover the costs of running the mutual fund including management, administrative, distribution, operating expenses, 12b-1 fees, other marketing expenses, and all other asset-based costs incurred by the fund, is statistically significant and moderately correlated with the fund family membership identifier (r=0.55, p<0.001). This relationship contributes to the debate introduced by Iannotta and Navone (2012) regarding what portion of fees is established at the fund level and what part is inherited from family structures. The number of directors, a corporate governance variable, also has a statistically significant and moderate strong correlation with the family of funds control variable (r=-0.62, p<0.001), albeit it is a negative relationship. This relationship is logical given
the popularity of unitary boards. According to the Investment Company Institute, since 1994 most mutual fund families have adopted a unitary board structure. Over 85 percent of all mutual fund families by 2014 have a unitary board. It is also common for large mutual fund families to have several clusters of boards within the complex, where each gets assigned to a specific number of funds. The popularity of clusters however, has declined from 17 percent of all mutual fund sponsors in 1994, to 14 percent of mutual fund families by 2014 (Investment Company Institute, 2015). Another factor in this relationship is the pervasiveness of corporate governance to transcend across departments and divisions in financial institutions (Haan & Vlahu, 2013). Hence, this relationship between family affiliation and size of the board of directors is logical. Finally, director fund ownership is moderately correlated to total net assets with higher director fund ownership concentrated in larger mutual funds ($r= 0.63, p<0.001$). TNA represents size of the fund, Sirri and Tufano (1998) and Prather et al. (2004) also use TNA as a proxy for popularity. As it is stated in the discussion of the prior table, directors are very selective in their investments and they only invest in a very small portion of the funds they serve, hence, it is reasonable to assume that directors are also susceptible to invest in several of the larger and therefore most popular funds among the ones they supervise.

There are three expense variables that are moderately to highly correlated with one another and their relationships are likely to be replicated in the population (Table III). Management fees have a significant and strong correlation with the leftover expense ratio that specifically excludes management fees and 12b-1 fees ($r= -0.84, p<0.001$). Extracting the management fee from the expense ratio makes the remaining portion of the expense ratio much smaller; thus, the larger the management fee, which has been proven to be the main component within the regular expense ratio, accounting for over 60 percent of the expense ratio, the smaller the resulting expense ratio remaining. Therefore the high correlation between these two expenses is fairly predictable. Interestingly, it is 12b-1 fees and not management expenses the component of expense ratios that carries a highly significant and relatively stronger correlation with expense ratios ($r=0.74, p<0.001$).
Three corporate governance variables are moderately to strongly correlated with expense ratio variables. Table III shows that all three are also statistically significantly. For many but not all of the funds, the lower the number of directors the higher the expense ratio ($r=-0.50$, $p<0.001$). Perhaps, this correlation is to a certain extent counterintuitive. Traditionally, larger boards have been considered ineffective. Tufano and Sevick’s (1997) results show that larger boards tend to charge higher fees. On the contrary, there is a slightly stronger significant negative correlation between the number of independent directors and the expense ratio ($r=-0.58$, $p<0.001$). Lastly, there is a moderately strong significant negative correlation between the number of independent directors and 12b-1 fees ($r=-0.70$, $p<0.001$). Higher board independence has been considered desirable for investors, since independent boards should be more effective negotiating lower fees for their customers (Cremers, Driessen, Maenhout, & Weinbaum, 2009). Del Guercio et al. (2003) find that board independence is associated with lower expense ratios.

Table III shows how nine corporate governance variables are moderately to strongly correlated with other corporate governance variables. A few relationships are perhaps, not surprising. There is a statistically significant moderate positive relationship between the number of directors and the number of independent directors ($r=0.48$, $p<0.001$). The number of independent directors in a given board is a direct consequence of the total number of directors; the SEC requires that a minimum percentage of the total number of directors on the board to be independent. Similarly predictable, the number of committee meetings has a statistically strong positive relationship with the number of board meetings ($r=0.84$, $p<0.001$). According to ICI’s report, it is common for committee meetings to be scheduled immediately before or after regularly scheduled board meetings. Although is also common for committees to schedule additional meetings if it is deemed necessary (Investment Company Institute, 2015), which explains also the difference in their mean values (Table II). Obviously, the number of committees has also a statistically significant, strong, and positive correlation with the number of committee meetings ($r=0.92$, $p<0.001$), as more committees translates into more committee meetings. Finally, among the less
surprising correlations, there is an almost perfect significant positive relationship between the number of funds overseen by the chairman of the board and the number of funds overseen by the directors in the board \( (r = 0.99, p < 0.001) \). This relationship is the direct consequence of the two most common types of boards’ structures coexisting in mutual fund sponsors: unitary boards and cluster boards. In 2014, approximately 86 percent of all mutual fund families have a unitary board structure; the remainder 14 percent of mutual fund families has a cluster board structure (Investment Company Institute, 2015). The prevalence of these two board structures means that either one single board or a small number of boards within a mutual fund family supervises all the mutual funds under the umbrella of that complex.

Interestingly, chairman of board tenure (Table III) is moderately negatively correlated with the number of meetings, which indicates that for many mutual funds, the longer the chairman of the board’s tenure the fewer the number of meetings \( (r = -0.56, p < 0.001) \). Although there are no large overarching trends in regards to the board meetings during the period of this study it seems that actually there has been an increase in the number of board meetings over time. In 1994, the proportion of mutual funds that has four board meetings a year is 83 percent; by 2014 this figure has decreased by 20 percent. Furthermore, in 2014, the number of mutual funds that holds five board meetings reaches 28 percent, which is six times higher than the 1994 levels, and the number of boards having six meetings or more doubles from 1994 and it stands at six percent in 2014. Thus, one can extrapolate that while chairmen cannot avoid getting older, they seem to be making a conscious effort to schedule less meetings. There is a statistically significant, moderate positive relationship between chairman of the board fund ownership and director fund ownership \( (r = 0.53, p < 0.001) \). Chen et al. (2008) suggest that chairmen ownership in the funds might be a mechanism to signal to the board that their chairperson’s intent is to maximize investors’ value, by reducing fees or increasing monitoring of managers. Thus, owning shares in the funds supervised by the COB would be perceived as a commitment to high board effort (Chen, Goldstein, & Jiang, 2008).
Finally, chairman of the board compensation per fund is a statistically significantly moderate correlate of four other board governance variables: individual fund director compensation, directors fund ownership, number of meetings, and COB fund ownership. There is an almost perfectly significant direct correlation between COB compensation and director compensation (r= 0.90, p<0.001). The link between chairman and director compensation has not been extensively established in the financial literature regarding mutual funds but a recent article by Oxelhein and Clarkson (2015), using a sample of publicly listed Swedish firms, suggests the possibility of collusion after finding a strong link among CEO, COB, and director compensation. Table III shows that for some of the funds, higher COB compensation per fund is indicative of higher director fund ownership (r=0.52, p<0.001). Simultaneously, higher COB compensation is significantly related to higher COB fund ownership (r =0.65, p<0.001). Chen et al. (2008) reveal that almost half of the mutual funds in their sample encourage directors and other executives to buy fund shares via a deferred compensation plan to take advantage of a tax benefit. Given the strong relationship between COB and director compensation and the fact that ownership is incentivized as a mechanism to defer compensation and reduce taxation, it seems reasonable to find a positive correlation between COB compensation and directors’ or COB’s fund ownership. Finally, COB compensation has a strong direct correlation with number of meetings (r =0.70, p<0.001). Traditionally, meeting fees encouraged meeting attendance and enhanced compensation. Although the portion of mutual funds paying meeting fees decreases considerably, and the amount of the meeting fees and director pay experience an unparalleled increase, the relationship between meeting fees and COB salary still prevails; (Green & Suzuki, 2013; Nili, 2015; Steven Hall & Partners, 2015).
IV. iii. Panel-Data Descriptive Statistics

[Insert Table IV here]

Table IV summarizes the descriptive statistics for the panel sample of individual mutual funds from 1998 to 2015, identifying three specific years: the first, the middle, and the last one. This approach to descriptive statistics for panel data using key years is in line with the panel data summary statistics shared by Sirri and Tufano (1998), Meschke (2007), Ferris and Yan (2007) and Iannotta and Navone (2012). Using the year 2000 as a benchmark for identifying the best and worst performers, funds are hand collected and compiled with a sample of 110 funds available for the first panel year, 1998. Funds that are hand collected for the year 1998 and continued to exist, remain in the panel data. Additional newly created funds from the same sample of funds’ families are added each subsequent year, including 2007 and 2015, reaching samples of 155 and 193 respectively; the same procedure is also employed by Iannotta and Navone (2012). The number of observations in their panel sample also nearly doubles from 1993 to 2006 by adding newly created funds from the same fund families contained in their first year, 1993.

Reflecting on the trends referenced by the Investment Company Institute, funds drop below the 8,000-mark at the beginning of the Great Recession in 2008 (Investment Company Institute, 2014). However, by 2015 the number of mutual funds broke again the 8,000-threshold with a total of 8,116 mutual funds reported that year. The higher sample sizes in 2007 and 2015 panel years reflect these changes in the mutual fund industry as the number of funds offered by mutual fund families expanded in the industry increased (Investment Company Institute, 2016). The higher sample sizes in the 2007 and 2015 panel years are also intended to attenuate the threat of survivorship bias. According to Prather et al. (2004), the addition of newer funds from the families of funds identified in the 1998 panel year reduces a skew based on the higher potential quality of funds that have survived over time.
Table IV includes: mean, median, and standard deviation values for the years 1998, 2007, and 2015 for all the mutual funds’ characteristics, expenses, and corporate governance traits that participate as control variables and explanatory regressors in any of the statistical models used in the analyses to test the hypotheses stated in this study. Overall, a total of 32 different variables are included in this table, organized as individual funds’ traits, expenses, and corporate governance characteristics including directors’ attributes, board structure, and chairman of the board attributes.

Table IV begins with six control variables (TNA, NAV, fund life, manager tenure, return, and capital flow); all of these variables appear in prior studies. The table identifies average total net assets of $2.32 billion, with a median of $95.30 million, in the year 1998, average TNA of $1.84 billion, with a median of $30.70 million, in 2007, and for 2015, $1.17 billion in average TNA, with a median of $23.75 million. Note, that the downward trend of the TNA from 1998 to 2015 is reflective of the manual data collection methodology as funds included in 2007 and 2015 are added at their inception and therefore are younger funds with smaller TNAs. These TNA figures restate the representativeness of the sample of funds collected for this study, since this decreasing assets trend is consistent with the TNA levels provided by the Investment Company Institute’s decade long report about mutual fund governance practices published in 2015. According to self-reported information shared with the ICI, by 6,452 mutual funds, the average TNA in 1998 is higher than the average TNA, collected from 7,764 funds, in 2007 or any year afterwards. Average individual fund’s TNA peaked in 2004 and then monotonically decreases until 2008, when it reaches a plateau that continues into 2014, the last year included in the ICI’s report (Investment Company Institute, 2015). On the contrary, the average Net Asset Value (NAV) increases over the three years selected from my 17-year panel dataset, with a NAV average of $21.06 in 1998, a NAV averaging $25.20 in 2007, and an average NAV of $28.39 in 2015. As the data is likely skewed, the median NAV tells a slightly different story with a base of $11.45 per share in 1998, a higher median fund per share price in 2007 of $15.54, and a lower than 2007, but slightly higher than 1998 median NAV in 2015 of $11.69. These figures are consistent with both the positive performance experienced before the financial crisis, which would explain the peak around 2007, and the inclusion of new funds throughout the time span of
the study, since newer funds are smaller and tend to be priced at considerably lower prices during their first years after inception.

The average fund life measured in years increase for each year of the panel data from 7.35 years in 1998 to 8.89 years in 2007 to 13.75 years in 2015. Iannotta and Navone's (2012) sample of funds is slightly older than the one I collected with average age of the funds of 12.9 and 11.13 for 1998 and 2006 respectively. Similarly, the median years of fund life increase monotonically from 1998 (four years) to 2007 (six years) and to 2015 (11 years). Berk and Green’s (2004) study develops a model that examines the puzzle around mutual fund flows and past performance. It has been often considered irrational for investors to chase past mutual funds’ returns. The authors note that the actual data reveals a higher longevity for younger funds than what their model predicts. Actual mutual fund mortality rates also accelerate much faster with age, contrary to what their model suggests should be a linear occurrence. As a possible explanation for the deviations from the observed behavior, the authors suggest potential weaknesses in the data available for older funds, but also propose managerial turnover within the mutual fund industry. Good managers might be promoted to newer funds, since according to the authors: portfolio managers tend to earn higher fees from funds when they begin operating. Their model fails to capture the fact that lower survival rates on older funds could be the consequence of the learning curve faced by new managers when they are assigned to a different fund that is already established (Berk & Green, 2004). Berk and Green’s (2004) study hence relates mutual fund longevity with manager tenure. In my sample, manager tenure, also measured in number of years, increases across the three years selected from the panel sample, with an average of 3.89, and a mean of four years in 1998, an average of 4.77, and a median of three years in 2007, and an average of 7.3 and a median of seven years in 2015. Berk and van Binsbergen (2015) in their study conveying actively managed U.S. mutual funds, including domestic and international investments; find that manager tenure might have a positive impact on funds returns. From their extensive sample, which only includes funds that are at least three years old, the authors find that mutual fund manager skills might be responsible for persistent differences in mutual funds return. Managers’ skill is defined, in their study, as the ability of mutual fund managers to extract
value from the market, represented by excess return from the funds’ benchmarks. They find that differences in managers’ skills remain for as long as a decade. Furthermore, the authors find large cross-sectional skill differences between the initial and final periods of a manager’s tenure in a mutual fund, with substantial increases in skill over time (Berk & Binsbergen, 2015).

The final two control variables: return and flow, are measured in percentages. The average return rate, while remaining negative, decreases dramatically from 1998 to 2007 from -1.32 percent to negative seven percent. A one percent additional average return rate decline occurred from 2007 to 2015, when mutual funds from my sample attained a mean of negative eight percent return. Comparatively, the returns on the S&P 500, also decline during that period, the returns on the industrial index the same three years are 28.34 percent, 5.48 percent, and 1.38 percent respectively (Federal Reserve Economic Data St. Louis, 2017). The S&P 500 returns, following the same pattern find in my data, also decrease at a diminishing rate although they manage to outperform the average returns from my sample of mutual funds in every period. Since my averages are computed as the percentage change in NAV in consecutive years, the worsening returns could be the result of poor performance, increasing fees, or a combination of both. A recent Morningstar study by Ptak (2017), which includes most of the population of domestic stock funds, between 2006 and 2016, shows a decline on average pre-fee excess returns. Average pre-fee excess returns currently remain below historical averages but have experienced a reduction in their standard deviation (Ptak, 2017); both stylized facts are also present in my data. Roiter (2016) contests the common conception that performance is a catalyst for mutual fund flows, a notion first introduced by Chevalier and Ellison (1997) and Sirri and Tufano (1998). According to Roiter (2016) regardless of fund performance annual net flows remain usually close to zero since redemptions tend to be cancelled by new sales. The author interprets the proximity in the levels of redemptions and new issues as evidence of investor disregard for fund performance. Consequently, his position shares the argument the SEC makes to justify keeping basic mutual fund governance structure unchanged overtime. According to Roiter (2016), the SEC argument is that there are multiple disincentives in place that discourage redemptions such as back-end loads, redemption fees, potential tax effects, in addition, similar expenses are experience
with new fund acquisitions. Redemptions and new acquisitions have considerable search costs and are financially expensive, making mutual fund investments fairly statistic. The author believes these costs explain the annual flow neutrality. Roiter (2016) contradicts the traditional view of investors’ inflows chasing mutual funds with past positive excess returns. In my sample, the median values for flows remain very close to zero as Roiter (2016) suggests. However, although the net flows remain negative, they experience a small increase over time. Net capital flow from investors increases across the panel years beginning with an average flow of -1.97 percent in 1998 and a median of -0.55 percent, to then increase to an average flow of -1.42 percent and a median of -0.04 percent by 2007, and ends in 2015 with flow reaching an average of -0.36 percent with a median of -0.21 percent. Maybe as a consequence of the aforementioned lackluster returns, mutual funds see withdrawals surpassing new purchases every year. The decrease in the hemorrhage of funds could be explained by the overall increase in size in the industry, as the number of investors and the number of funds expanded. Researchers since Chevalier and Ellison (1997) and Sirri and Tufano (1998) find a strong bond between past positive performance and inflows to mutual funds, and simultaneously a weaker link between outflows and poor past performance. Hence, the decreasing exodus of investor funds emerging from the descriptive statistics extracted from my panel data, paired with the deterioration of performance of the selected mutual funds in this panel, support their findings.

Eight expense variables and expense related characteristics are described in table IV including: expense ratio, remaining expense ratio omitting managerial expenses and 12b-1 fees, management fees, 12b-1 fees, brokerage commissions, soft dollar compensation, turnover rate, and the average percentage of cash held by the mutual fund. As Golec (1996) predicts, the average expense ratio remains relatively flat across the three panel years with a mean of 1.179 percent in 1998, a mean of 1.308 percent in 2007, and a mean of 1.214 percent in 2015. Comparatively, another study that uses panel data that overlaps with mine and reports descriptive statistics for expense ratios, Iannotta and Navone’s (2012), shows average expense ratios of 1.25 percent for 1998 and 1.34 percent for 2006. Both values are extremely close to what appears in my sample. There is a considerable increase in the median across the three panel
years with a median of 1.03 percent in 1998, with a surge to a median of 1.109 percent in 2007, and a further growing median of 1.57 percent by 2015. Ptak (2017), in his decade long study of U.S. stock mutual funds extending into 2016, concludes that, excluding a small correction in mutual fund fees following the financial crisis in 2007-2008 (a correction that some may consider window dressing), mutual fund fees have increase monotonically. However, the same cannot be said about returns; mutual funds have not experienced a comparable increase in returns that would help to justify higher fees. In Ptak’s (2017) article, after considering the poor results obtained in performance by mutual funds managers (in continuous decline since 2007), and the discrete increases that mutual fund fees have experienced, investors have experienced a destruction of their wealth. Seventy percent of the funds included in his study do not outperform their benchmarks after fees are subtracted. Among the funds that do outperform their benchmarks, the average excess return net of fees is less than 0.3 percent. However, in my sample, expense ratios excluding managerial expenses and 12b-1 fees follow a different pattern, with a 1998 average of 0.7 percent and a median of 0.4 percent, a 2007 slight dip with an average of 0.4 percent and a median of 0.3 percent, and a further dip by 2015 with the average and median values both reaching 0.2 percent. The increase in overall mutual fund costs accompanied by the slight decrease in expense ratios excluding managerial expenses and 12b-1 fees suggests that either managerial expenses or 12b-1 fees or both have increased to compensate for the decrease of the other components in the expense ratios. In fact, two of the components of expense ratios: management fees and 12b-1 fees, noted in table IV, increase across the three panel years 1998, 2007, and 2015. Average and median management fees increase from 1998 to 2007 and remain flat or slightly increase from 2007 to 2015. Management fees start with a base average of 0.6 percent and a median of 0.7 percent in 1998, experience a slight increase to an average of 0.7 percent and a median of 0.8 percent by 2007, and remains the same in 2015 with an average of 0.7 percent and a median of 0.8 percent. Malkiel (2013) notes that mutual fund management fees increase significantly during the period between 1980 and 2006, when they nearly double. The proportion of 12b-1 fees charged to investors also increases slightly across the three panel years. The amount charged in 1998 is close to zero, with an average of 0.06 percent and zero median, it increases by
2007 to an average of 0.239 percent with a median of 0.205 percent, and slightly increases by 2015 to an average of 0.245 percent with a median of 0.25 percent. Iannotta and Navone (2012) report similar increases in 12b-1 charges between 1998 and 2006 from 0.23 percent to 0.36 percent.

Brokerage fees (Table IV) perform differently across the three panel years (1998, 2007, 2015); with an increase in average brokerage fees from 1998, with a mean of 0.44 percent, to 2007, with a mean of 0.977 percent. Brokerage fees decrease from 2007 to 2015, with a 2007 average of 0.977 percent to a 2015 average brokerage fee of 0.312 percent. This reduction could be the consequence of a shift on investors’ preferences. Mutual fund customers now demand mutual funds with lower fees, and are starting to consider turnover as a source of expenses (Bernicke, 2011). According to the ICI, in 2015, the average investor prefers equity funds, with low fees, and below-average turnover rates; over half of the assets invested in equity fund correspond to mutual funds with turnover rates lower than 30 percent (Investment Company Institute, 2016). Median brokerage fees follow a similar pattern with a median in 1998 of 0.128 percent, to a higher median in 2007 of 0.296 percent, and to a lower median in 2015 of 0.023 percent. Turnover ratios are most likely behind the level of brokerage commissions. In my yearly samples, average turnover rate increases from 1998 to 2007 and decreases from 2007 to 2015 with a 1998 average of 148.19 percent, a 2007 average of 272 percent, and a 2015 somewhat lower average of 259.91 percent. One possible explanation for the discrepancies in the magnitude of the decreases between turnover ratios and brokerage fees from 2007 to 2015 could be the result of the increase in premium soft dollar brokerage commissions, which go from 12 percent of brokerage fees in 2007 to 19 percent of brokerage commissions in 2015. Funds with a turnover of 100 percent or more make enough transactions to replace their entire investment portfolio at least once a year. The medians for these three panel years follow the same pattern with an increase from 1998 to 2007, from 86 percent to 138 percent, and a decrease from 2007 to 2015, from 138 percent to 107 percent. The ICI computes the industry asset-weighted average turnover rate since 1980, which is now at 61 percent. The increasing popularity of index funds, and maybe a conscious effort from mutual fund managers, who may be responding to mutual funds with below-average turnover capturing more shareholder dollars, is causing a decrease in the
industry asset-weighted average turnover rate, which reached 44 percent in 2015 (Investment Company Institute, 2016). Additional insight into brokerage commission is provided by the behavior of soft dollar compensation, which either remains flat or faces marginal decreases in table IV. Soft dollar compensation are reimbursements in the form of research awarded to mutual fund managers by service brokers in exchange for brokerage transactions. Average soft dollar compensation does not change dramatically across the first two panel years but it is cut in half in the last year considered. In 1998, there is an average of 0.12 percent and a median close to 0, of 0.04 percent, in soft dollar compensation. This figure remains roughly the same in 2007 and in 2015 it decreases with a mean of 0.06 percent and a median of zero. Soft dollar compensation as a percentage of total brokerage commissions decreases over time from 27.27 percent of all brokerage commissions in 1998 to 19 percent of all brokerage transactions by 2015.

The last expense ratio included in table IV follows a define pattern across the three panel years. With the exception of a slight dip in median from 1998 to 2007, the average and median percentage of average cash holdings increases across all three panel years in table IV. The cash ratio goes from a mean of 3.45 percent and a median of 2.56 percent in 1998, to a mean of 5.42 percent and a median of 2.08 percent in 2007, and by 2015 reaches a mean of 7.31 percent and a median of 3.50 percent. Note that the slight dip in the median from 1998 to 2007 may also be the result of the increase in the number of funds that are added to the sample every year. O’Rielly and Preisano (2010) believe the level of the cash holdings that fund managers keep in their portfolios explains a large portion of the funds’ underperformance. They use a sample of approximately 540 equity funds, extracted from Morningstar, evenly distributed with respect to their investment objective in large and small capitalization firms, over a ten-year period starting in 1989. The authors quantify an average cash ratio of 6.75 percent in their sample of approximately 540 equity funds (O’Rielly & Preisano, 2010). Malhotra and McLeod’s (1997) descriptive statistics report an 8.03 percent level of cash remaining in the average portfolio in their sample of 238 funds. Both authors’ reported levels for the average portfolio cash holdings are very close to the
ones contained in my yearly samples. As conveyed by O’Rielly and Preisano (2010) the detrimental effect of the cash holdings is more meaningful for well performing funds.

Table IV also includes 17 corporate governance variables. The first seven are director related variables including number of directors, number of independent directors, number of female directors, directors fund ownership range, number of funds overseen by directors, director compensation per fund, and aggregate director compensation per fund family. The next three corporate governance variables focus on committees, they are: the number of committees, the number of committee meetings, and meeting fees. Finally, the last remaining seven variables measure chairman of the board characteristics and other attributes including: age of the COB, tenure of the COB, number of funds overseen by the COB, COB fund ownership, COB compensation per fund, aggregate COB compensation, and lastly the number of other officers.

There are no clear patterns across the five director related variables throughout the three panel years in table IV. However, all directors’ related variables provide an interesting insight into the corporate governance of this sample of mutual funds. The average number of directors decreases slightly each considered year with an average of 7.19 directors in 1998, 7.12 directors in 2007, and 7.03 directors in 2015. The median number of directors remains flat at six directors from 1998 to 2007 and increases to eight directors by 2015. All these values remain below the average number of directors per board of 9.2 cited by Burns (2003) yet they oscillate around seven, which according to the author is considered the ideal number of directors serving on a board. By 2016, 5,440 directors served in the boards of Fortune 500 companies, a slight decrease from 5,463 occupied seats in 2010. In 2015, the average Fortune 500 company board has 11.07 members, with most boards ranging from 9 to 11 directors (Alliance for Board Diversity; Deloitte, 2016). The average number of independent directors increases marginally from 1998 to 2007, to 2015, with means of 5.16 directors, 5.46 directors, and 5.54 directors respectively. Boards also experience an overall increase in the median number of independent directors from five directors in 1998, to six directors in 2015, but it should be noted a temporary dip is experienced in 2007 with a
median of four directors. The Investment Company Act of 1940 requires at least 40 percent of independent directors in a mutual fund boards. In 2004, the SEC Amendment to the Investment Company Act of 1940 includes two new requirements: boards should count with at least 75 percent of independent members, and chairman of the board must be independent also. The 2004 Amendment was supposed to take place by 2006 but it was challenged and never implemented. However, the 2016 Investment Company Fact Book reports that independent directors occupy at least 75 percent of seats in 83 percent of mutual fund boards (Investment Company Institute, 2016). In my sample, board independence increases monotonically; on average, independent directors occupy 71.77 percent board seats in 1998, they grow to 76.69 percent by 2007 and by 2015 independent directors reach almost 80 percent of board seats. Additionally, following by the work of Adams and Ferreira (2008), I also record the number of women in mutual fund boards. The average number of female directors remains small and decreases slightly between 1998 and 2007 from a mean of 0.40 women to a mean of 0.34 women. The median mutual fund both years has no women serving in their boards. The average and median number of female directors rises by 2015 to a mean of 0.6 women in boards and a median of one female director.

According to a recent report by the Alliance for Board Diversity, a coalition of organizations promoting gender and racial diversity in boardrooms, and Deloitte, the largest multinational professional services firm, the number of women and other minority groups in Fortune 100 and Fortune 500 companies’ boards has increased marginally. Gender diversity increases between 2010 and 2016 from 15.7 percent to 20.2 percent (Alliance for Board Diversity; Deloitte, 2016). In my sample, in the year 2015, women occupy 12.5 percent of the median board, and 8.53 percent of directorships on average, which constitutes an increase from both 1998 and 2007 average levels, which are 5.56 percent and 4.78 percent respectively.

The median director in my sample does not have investments in the funds he oversees for each of the three panel years (Table IV). As this is a categorical variable derived from reported ranges, interpreting the mean might be not as straightforward. In 1998 the average director has investments in the fund between $10,000 and $50,000. In 2007, prior to the recession, the average directors’ investment
value increases to the range of $50,000 to $100,000. Post-recession, the average directors’ portfolio value is similar to the 1998 value with a range between $10,000 and $50,000. Since the values of the portfolios influence these ratios without necessarily increasing the amounts invested, the record values experienced in the stock market pre-Great Recession, might be partly responsible for the trend observed here. It is also possible that including newly issued funds, which are being added to the panel each year, is making down the average amounts invested by director per fund smaller. Nonetheless, my ranges are consistent with the values reported by Chen et al. (2008). The authors find that about two thirds of directors are invested in several of the funds they oversee. According to their account, the average investment for a single director-fund pair is about $14,000, which is within the ranges reported in my descriptive statistics for two of the three panel data years (Chen, Goldstein, & Jiang, 2008). The fact that the level of director ownership remains flat after initially increasing is even more interesting given that that the number of funds overseen by directors increases dramatically each of the panel years with a mean of 5.38 and a median of five funds in 1998, a mean of 109 and a median of 94 funds in 2007, and a mean of 128.7 and a median of 158 funds in 2015. The Investment Company Institute also reports a significant increase in the number of funds overseen by independent directors, similar to what appears in my data (Investment Company Institute, 2015). On the contrary, director compensation per fund does not follow a clear pattern; despite a consistent increase in aggregate director compensation across the three panel years (Table IV). Average director compensation per fund decreases from 1998 to 2007 by a few hundred dollars, from $3,114.66 to $2,657.93. Yet, average director compensation per fund then increases from 2007 to 2015, when it reaches $3,904.10, and exceeds the 1998 level by an average of almost $800. Median director compensation follows a similar pattern although less dramatic, with the 1998 median director compensation at $2,142.86, dropping to a 2007 median director compensation of $1,600, and an slightly higher 2015 median director compensation of $1,666.67. Conversely, average and median aggregate director compensation increases substantially from 1998, to 2007, and to 2015. In 1998, average aggregate director compensation is $70,626.06 followed by close median aggregate salary of $70,500; in 2007 it almost doubles with average aggregate director compensation of $130,000 and a
median independent director aggregate salary of $140,000. By 2015, aggregate director compensation nearly triples the 1998 levels with an average of $273,234.54 and median independent director pay of $197,000. The increases in the number of funds supervised by directors and the lower pay associated with newly created funds explain the reduction in average pay per fund and the simultaneous increase in aggregate pay per fund family. In comparison, from a sample of 2,435 funds from the years 2002 and 2003, Chen’s et al. (2008) average annual compensation for disinterested directors is $7,027 from a single fund and in aggregate terms is $79,857 per fund family. Nili (2015) reports also a robust demand driven growth in independent director compensation in the mutual fund industry consequence of an increasingly hostile regulatory environment framed by the Sarbanes-Oxley’s and Dodd Frank’s requirements, higher expectations of qualified financial expertise, and greater workloads. The author asserts that over the last decade independent directors have experienced on average at least a five percent annual rise in their pay (Nili, 2015).

The next set of board characteristics that I collected for this study centers on board behavior, in particular how boards are subdivided into committees, and how frequently the entire board or individual board committees’ members meet. A recent survey-based study commissioned by Price Waterhouse & Coopers (PwC), the second largest professional services firm in the world, designed to define the importance of the Audit Committee in the mutual fund industry, compares U.S. boards with Canadian’s boards, which frequently do not include an audit committee (PwC, 2016). In my sample, the average number of committees in fund boards increases slightly from an average of just under three committees in 1998, to an average of just over three committees in 2007, and close to three and a half committees in 2015 with an average of 3.4 committees (Table IV). The median across all three-panel years remained the same, at three committees per fund board. My sample confirms several of the findings from the PwC’s survey, which verifies most U.S. mutual funds have three committees. Mutual fund managers declare an ever-changing business environment, specifically citing: IT, cyber security, valuation, regulation, and risk management, as the force driving committees’ configuration and responsibilities.
Three quarters of mutual funds participating in the PwC’s survey have a valuation committee; more than 60 percent of mutual funds have a regulatory and compliance committee, and over 30 percent have a risk committee, which discusses issues related to IT and cyber security (PwC, 2016). From my panel, the average and median number of committee meetings however, increase over all three panel years. The average number of committee meetings in 1998 is 12.55 while the median fund the same year holds six committee meetings; 2007 has an average of 19.4 and a median of 19 committee meetings, and during 2015 mutual funds in my sample experience a slight dip in the average number of committee meetings with 18.07 and, simultaneously, a rise to a median of 25 committee meetings. Compared to my sample, the ICI’s Overview of Fund Governance Practices reports a smaller number of meetings across the industry but accounts for a similar significant increase in committee meetings; during their report’s 15-year timespan the average number of committee meetings doubles (Investment Company Institute, 2015). Average and median meeting fees also increase each of the panel years (Table IV) with an average of $2,453.70 and a median $3,000 for 1998, increasing to an average meeting fee of $4,002.98 and median of $5,000 in 2007, and then tripling to an average for meeting fees of $13,195.73 and median of $15,000 by 2015. The values are large compared to a median meeting fee for 2014 of $2,000 for large-cap firms, not mutual funds, according to a study by the law and consulting firm Steven Hall & Partners (2015). Pritchard et al. (2003) hand collected information from almost 3,200 firms, not mutual funds, for the year 1995 and report that 20 years ago, the average compensation per board meeting was $988.81 (Pritchard, Ferris, & Jagannathan, 2003). Lastly, the members of the board of directors are not the only officers that serve in mutual funds, additional high rank executives or officers, including the CEO, are also employed. The last board-related governance variable included in table IV is the number of other officers in the fund. The average and median number of other mutual fund officers decreases between 1998 and 2007, from a mean 11.85 with a median of 13 to a mean of 10 and a median of 8 other officers. The average and median of other fund officers increase by 2015 with a mean of 12.41 and a median of 16 people.
Several Chairmen of the Board variables provide interesting patterns around board governance across the three panel years. The average age and tenure of the chairman of the board increase each year of the panel in table IV. The average COB is 47.72 years old in 1998; in 2007, the average COB is 56.7 years old, and finally, the average COB reaches 62.18 years by 2015. Surprisingly, the median age of the COB increases from 1998 to 2007, from 61 years to 64 years, but then decreases from 2007 to 2015, from 64 years to 57 years. Nevertheless, average and median tenure of the COB increase each panel year beginning with an average of 3.04 years and a median of six years in 1998, to an average tenure of 7.75 and median of nine years in 2007, to finalize with an average of 14.17 and a median of 15 years in 2015. From their sample consisting of 2,435 funds for the years 2002 and 2003, Chen et al. (2008) report that their average director is 61.7 years old, with a close median director age at 62 years, coupled with an average and median tenure of 8.7 and seven years, respectively. About 11 percent of their sample of 2,435 unique executive-mutual fund observations corresponds to a chairperson. Their values, taken from a considerably larger sample, are within one and two years of my age and tenure values for 2007. Fund ownership hold by the COB, like directors’ fund ownership, is measured as a categorical variable. The median COB fund ownership is zero, indicating no fund ownership across all three panel years in table IV. The average COB fund ownership however, is slightly higher than the median with increasing means ranging from 1998, to 2007, and to 2015. Still, COB fund ownership stayed in the range of $1 to $10,000 while pulling the mean closer to an ownership in the $10,000 to $50,000 range by 2015. Chen et al. (2008) indicate that, in their sample, average director ownership is about $14,000 per director-fund, with 11 percent of the independent director observations corresponding to chairmen. Cremers et al. (2009) compile average director information from 134 funds across 19 families for their 2002 article, which focuses in the relationship between director ownership and compensation within corporate governance in the mutual fund industry. The authors reveal that, on average, independent directors hold of $8,058 per individual fund overseen (Cremers, Driessen, Maenhout, & Weinbaum, 2009), an amount that is well within the range reported in my descriptive statistics, table IV.
As it happens with directors’ oversight, the number of funds overseen by chairmen increases considerably each of the panel years with a mean of three and a median of four funds in 1998, a mean of 110.97 and a median of 94 in 2007, and a mean of 133.77 and a median of 169 in 2015. Accordingly, the average COB compensation per fund increases dramatically; it doubles, from 1998 to 2007, from $2,203.00 to $5,319.94, and then remains relatively flat, with a slight increase, in 2015 with an average COB compensation per fund of $5,957.13. The median COB compensation per fund actually decreases across the three panel years with a median pay of $1,706 in 1998, a median of $1,310 in 2007, and a median COB compensation per fund of $1,197 in 2015. However, as it is the case with aggregate director pay, both average and mean aggregate COB compensation increased over the three panel years. In 1998, the average COB aggregate compensation is $98,567.05 with a median of $86,690; then, it grows to an average of $170,000 and a median of $110,000 in 2007, and reaches an average COB aggregate compensation of $295,004.00 and a median $227,500 in 2015. The increase in the number of funds supervised by the chair and the lower pay associated to newly created funds explain the minor reduction in median pay per fund and the simultaneous increase in aggregate pay per fund sponsor. Chairmen receive an extra retainer to compensate for their higher level of responsibility. According to Nili (2015) differences in salaries between non-interested directors and their independent Chairmen salaries vary between a little bit more than the modest extra retainer paid to the Audit Committee Chairman to an additional $200,000 or more (Nili, 2015).
IV. iv. Panel-data Correlations

[Insert Table V here]

Pearson’s product moment correlation coefficients are run across all 39 variables from the panel data sample in table V; the variables include mutual fund controls, expenses, and corporate governance characteristics. Statistically significant correlations (p<0.05) with moderate to high strength (| r>0.50 |) are interpreted below starting with control variables; all of the variables noted in the next paragraphs show statistically significant correlations.

From the 12 control variables considered: TNA, family identifier, investment objective, annual return, three-year cumulative return, fund flow, risk, fund life, institutional flag, dead flag, regulation flag, and sponsor ownership flag, only two, risk and TNA, demonstrate a strong correlation to one another (r=0.75, p<0.001). Ever since Fama and French (1992) seminal paper rejected the CAPM in favor of an empirically based three factor model, which included size as an important risk factor, other researchers have considered size in their analyses of risk and return. More recently Elton et al. (2008) assert that size is an important mutual fund risk factor frequently overlooked by investors. Mainly because of the pernicious effect that size frequently has on mutual fund performance. According to several researchers, as the mutual fund gets larger it becomes increasingly difficult for mutual fund managers to pursue profitable strategies (Berk & Green, 2004; Prather, Bertin, & Henker, 2004; Elton, Gruber, & Blake, 2008).

Several control variables are moderately or strongly related to expense and governance variables of interest in the panel data. First, TNA is moderately to strongly correlated with several corporate governance variables of interest. TNA has a significant moderate positive relationship with director compensation per fund (r=0.60, p<0.001) and director fund ownership (r=0.63, p<0.001). It also has a
strong and positive correlation with the number of meetings held ($r=0.76$, $p<0.001$). Finally, there is also a strong positive relationship between TNA and COB compensation per fund ($r=0.76$, $p<0.001$).

Similarly, risk carries a moderate positive relationship with two of the same corporate governance variables: the number of meetings ($r=0.62$, $p<0.001$) and the COB compensation per fund ($r=0.58$, $p<0.001$). Ferris and Yan’s (2007) results also points towards these moderate correlations between fund size, risk, and corporate governance variables. Mutual funds’ TNA could be considered a proxy for fund complexity or risk. One would expect actively managed larger funds to be more complex, and as it is just mentioned earlier, potentially riskier. Thus, directors and COB would expect to receive a higher pay from these larger and riskier funds, as a reflection of their complexity, and the higher requirements for managers’ skill level or directors’ supervising capabilities. Similarly, fund life is strongly related to the number of meetings ($r=0.76$, $p<0.001$) and COB compensation per fund ($r=0.70$, $p<0.001$). This implies that in general, given the tournament-like environment in the mutual fund industry, in which funds strive for survival, larger funds tend to also be older funds (Brown, Harlow, & Starks, 1996). Brown et al. (1996) are among the first researchers to present this view of the mutual fund competitive landscape as a tournament. According to the authors, all funds from the same investment objective compete with one another for the same group of potential investors’ capital. In order to ‘win’ this tournament, mutual funds employ marketing tools, which capitalize in their past performance, as a way to attract investors with the ultimate goal to grow in size, and therefore to maximize revenues, which are the fees charged to mutual funds’ customers by parent companies (Brown, Harlow, & Starks, 1996).

Finally the last control variable to consider, the fund family categorical variable, has no moderate or strong relationship with any expense variables. It does have a strong negative relationship with one governance variable, number of meetings ($r=-0.80$, $p<0.001$). This makes sense given the fact that most mutual fund families have a unitary board, and that the most common alternative to unitary boards for large mutual fund families is to have clusters of several boards within the complex, each representing a specific number of funds. Investment objectives, cumulative return, return, flow of capitals, institutional
flag, and regulation flag, are not significantly moderately or strongly correlated with any control, expense, or corporate governance variables.

The expense variables comprise: full expense ratio, the remnant of the expense ratio that specifically excludes management fees and 12b-1 fees, management fees, 12b-1 fees, percentage of funds held in cash, brokerage fees, soft dollar compensation, and turnover ratio. Expense ratio is composed mainly of three elements: management fees, 12b-1 fees, and the administrative, distribution, operating, and other asset-based expenses. Hence, as it would be innately expected expense ratio has a significant correlation with the other three expense variables that are part of it (the leftover expense ratio after management commissions and 12b-1 fees have been extracted, management fees, and 12b-1 fees). Expense ratio has a moderate and positive relationship with the persisting part of the expense ratio net of management fees and 12b-1 fees (r=0.60, p<0.001). Expense ratio also exhibits a moderately positive relationship with management fees (r=0.57, p<0.001), and 12b-1 fees (r=0.68, p<0.001). Nevertheless, more revealing is the relationship between expense ratio and the number of other officers, both are negatively correlated (r=-0.61, p<0.001). In parallel, the categorical control variable, sponsor ownership, has a moderate to strong relationship with two variables of interest: expense ratio and the number of other officers. Sponsor ownership is a dichotomous variable that takes the value of one if the fund is a publicly traded company and zero if it is privately owned. Sponsor ownership has a moderately negative correlation with expense ratio (r=-0.63, p<0.001) and a strong positive correlation with the number of other officers (r=0.76, p<0.001). These relationships suggest that mutual funds that are publicly held tend to have lower expense ratios and employ more high rank officers; albeit contrary to what might be expected, mutual funds with higher number of officers might have lower expense ratios. As mentioned in the literature review, the importance of the nature of the parent company ownership on mutual fund expenses has not escaped researchers. Adams’ et al. (2010) findings empirically support the relationship apparent in my correlation table. According to their study, lower overall expense ratios are offered by
mutual funds from publicly held families. Similarly, Adams et al. (2013) find mutual funds from publicly owned sponsors to be more proactive substituting underperforming managers.

Judging by the correlation coefficients of several of the 18 corporate governance variables among themselves, there seem to be an underlying structure or corporate governance that permeates through different board of director attributes. Although a couple of the relationships are so strong that it is prudent not to use both traits together in the same regression, to avoid endogeneity, the fact that corporate governance characteristics relate to each other in a moderate to strong manner not only is not discouraging but it also reveals that corporate governance, although, might not be a exact science, is definitively capturing something profound in the way firms are managed or in their internal structure. There are several common themes running through part of the correlations. First, there is board design; Del Guercio et al. (2003) find that board structure plays a role in how well closed-end fund investors’ interests are served. There are no rules that apply to the optimal number of directors, number of committees, or board meetings. In my panel dataset, number of directors is moderately to strongly correlated with the number of meetings (r=0.70, p<0.001) and the number of committees (r=0.55, p<0.001). A recent practitioner survey study, conducted by PwC, partly contributes to the understanding of this complex network of relationships. The leading consulting group reports that most U.S. mutual funds select the number of: board members, committees in place, and meetings held as a function of regulation and risk management (PwC, 2016). As one may expect, the number of committees is strong and positively correlated with committee meetings (r=0.90, p<0.001). Finally, the committee meetings variable is also moderate and positively correlated with the number of funds overseen by the COB (r=0.51, p<0.001) and the number of other officers (r=0.53, p<0.001).

Likely as consequence of the unitary board and cluster boards structure prevalent in most large mutual fund families, the number of funds overseen by directors shares, not surprisingly, an almost perfect positive correlation with the number of funds overseen by COB (r=0.96, p<0.001). Next, the number of funds overseen by directors has also a moderate positive nexus to meeting fees (r=0.56,
p<0.001). Chen et al. (2008) find support for the optional contracting theory when they are capable of matching directors’ ownership patterns with the portfolio of funds they oversee. Ownership is one of the most effective mechanisms in place to ensure that directors are going to defend mutual fund customers’ interests. Especially since director compensation might suggest a stronger alliance to the mutual fund family and not the average mutual fund investor (Chen, Goldstein, & Jiang, 2008). The correlation coefficients bring all these elements together and hint towards the idea of busy boards. Director compensation per fund is moderately correlated with directors fund ownership (r=0.61, p<0.001) and COB compensation per fund (r=0.75, p<0.001). Directors fund ownership has also a positive strong relationship with COB compensation per fund (r=0.75, p<0.001), in addition to being a moderately correlated with COB fund ownership (r=0.53, p=0.001). The number of female directors variable has also a moderate positive link with the number of board meetings (r=0.66, p<0.001), as does with director compensation per fund (r=0.68, p<0.001), and the number of funds overseen by directors (r=0.70, p<0.001). Busy boards are considered boards in which the majority of the members serve in at least three other boards. The corporate financial research community is divided in terms of the implications of such situation. Fama and Jensen (1983) and Ferris et al. (2003), for instance, find that directors capable of serving in different boards tend to command higher salaries and cast a positive effect on firm performance. In table V, measures of board activity such as the number of meetings, which shows a moderate to strong positive correlation with number of committee meetings (r=0.67, p<0.001), also have a positive relationship to compensation; the correlation of number of meetings with the COB compensation is moderately positive (r=0.76, p<0.001). Meeting fees similarly, has a moderate to strong relationship with committee meetings (r=0.57, p<0.001), and with COB compensation per fund (r=0.83, p<0.001), while also hints to a moderate positive relationship with the number of funds overseen by the COB (r=0.58, p<0.001). Interestingly, Cremers et al. (2005) find a direct relationship between directors’ ownership and fund performance; Chen et al. (2008) also share their findings. As it is explained in the results portion on this dissertation, an analogous phenomenon is observed in my analysis, confirming the connections just revealed among several variables and executive compensation. For a full discussion of
this topics, please refer to section VI. B. iii. & iv., which refers to the panel-data analysis of executive compensation, as reflected by the results contained in tables XXVIII through XXXB.

V. Methodology

V. I. Variables

[Insert Table I here]

The preceding literature review revealed that the starting point for Prather et al. (2004) is the lack of unanimity in the mutual fund literature with respect to the forces driven expense ratios. Their proposed solution to this problem is to consider as many potential influential factors as possible. Their approach resonates with me; I use also a comprehensive list of mutual fund fee determinants to avoid ignoring any reasonable influencer. To facilitate this analysis I have classified the independent variables into five large groups according to the nature of the information they provide. Thus, these five groups are: individual fund characteristics, fund expenses, corporate governance, and director and COB traits. Table I presents each group, which includes multiple individual variables.

Even though my main focus is to find traceable relationships between either brokerage fees or executive compensation and the variables of interest: corporate governance characteristics and mutual fund expenses, my models control for any mutual fund characteristics that might help explaining the shape of executive compensation and the level of brokerage fees. The most ubiquitous determinant of mutual fund fees in the literature is fund size. The literature shows, in many cases, the statistical significance of economies of scale. It is widely accepted that mutual funds is an easily scalable business; multiple custodial, distribution, marketing, or administrative expenses remain the same level for large ranges and their execution has been extensively automated (Malkiel, 2013). Fund size is usually
considered as the raw monetary value of assets under management; alternatively, several authors decide to weight it with respect to the number of shares outstanding, and use NAV instead (Prather, Bertin, & Henker, 2004). In other disciplines, it is also common to use a more oblique proxy for firm size that includes an aspect of efficiency, such as the number of employees or the number of qualified employees (Gaffeo, Gallegati, & Palestrini, 2003; Kumar & Phrommathed, 2005). Given the consensus around the existence of economies of scale, materializing in smaller fund fees, I consider two proxies for size: assets under individual funds’ management, and an alternative measurement such as the number of other officers, which is also hand-collected for this study.

Investment objective is another of the fund characteristics that has an impact on fund heterogeneity. Mutual funds are far from a homogeneous product; several of the differences captured by my models are the consequence of the diversity in the mutual fund industry. To limit the scope of this paper I focus only on domestic equity and bond funds, excluding balanced funds, funds whose main objective is to invest in real estate, money markets funds, etc. Iannotta and Navone (2012) trying to decipher mutual fund fee dispersion strip the funds from as much heterogeneity as possible. Mutual funds’ investment objectives account for part of that fund heterogeneity, and Iannotta and Navone (2012) include them as one of their control variables. Aware of the important role of the funds’ objectives, Prather et al. (2004), in their fixed effects model, employ an interaction variable that combines year and investment objective because they believe the influence of the investment objective varies through the years. Mutual funds report their investment objectives in their prospectus, however since funds sometimes diverge from their stated objectives, Morningstar and CRSP provide their own investment objective categories. Morningstar, which set the standard for mutual fund classifications, uses nine combinations of market capitalization and fund value for each category. However, the CRSP mutual fund dataset provides only three different classifications for investment objectives. The three categories reported by CRSP that prevails after 1998 include: domestic equity, international equity and fixed income (CRSP, 2014). Accordingly, for this study, a set of categorical variables is constructed to reflect the
funds’ investment objectives. During the preliminary analysis I identified the most numerous investment objective, domestic equity, and used it as the default model by excluding its group from the categorical variable. Perhaps funds specializing in certain investment objectives exhibit higher expense ratios or require more dexterity from their managers and more due diligence from their directors. For instance brokerage fees might be higher for funds trading mostly bond markets, while managers going for stocks may need to take more risks and invest in smaller companies with the potential for rapid capital appreciation.

Mutual fund past performance is a logical regressor to include in my models. If competitive forces drive the mutual fund labor market then higher manager compensation should result from superior performance. Part of the directors’ responsibilities is to ensure that the level of fees charged is fair or justified. It is reasonable to expect that directors would consider the fund performance when addressing the fee negotiation process. Therefore, higher past performance should be positively related to management fees, partly because managers’ compensation might have a variable portion that is proportional to the fund’s performance. On the contrary, there is not such a strong argument to link compensation from directors and COB, who are mainly concerned with protecting the interest of mutual fund customers and supervising the fund's officers, with mutual fund performance. Thus, the compensation of the directors and COB might be mostly on a fixed basis and therefore be less influenced by performance (Investment Company Institute, 2014). Similarly, there is no a priori reason to anticipate any particular relationship between past performance and brokerage fees. However, if the efficient market hypothesis holds, then funds with high turnover might experience poor performance because of the cost of transacting. Alternatively, if the mutual fund manager has superior investment skills, then higher brokerage fees, triggered by insightful trading, might result in abnormal positive returns.

Conclusively, there are multiple possible instruments available to measure performance including: increase in TNA or NAV, yield, which includes the increase in NAV and income distributions, the sum of the capital gains yield to date and the dividend payments to date, etc. Depending on the approach using
alternative instruments might make more sense; if the researcher’s interests is to make his work relevant for practitioners or to consider the behavioral aspects of his prospective results, then one might want to pick measures of performance that are most likely used by investors (Sirri & Tufano, 1998). However, to maximize my understanding of the underlying relationships in my data, I consider all three alternative measurements of performance trying to capture performance over the prior year; and settled for the change in NAV. I like the immediacy of the change in NAV as my performance variable because it is the measurement that matter the most for investors and is net of expenses. Additionally, I also include a cumulative measurement for performance by computing the compound return over the prior three years. Using alternative measurements helped me to evaluate my results and also serves as a robustness check through the process.

In finance the expected relationship between risk and performance is well documented. However, the relationship between risk and compensation or risk and brokerage fees is not as straightforward. Sirri and Tufano (1998) find partial evidence to claim that investors do care about the level of risk taken by their mutual fund managers. The authors are concerned with mutual funds’ customer behavior, so they pick the standard deviation of monthly returns over the prior year to measure risk since this information is commonly reported to investors. I include this as my measurement for mutual fund risk; even if mutual funds’ investors do not care about the risk profile of the funds where they invest, what is most likely a considerable amount of their wealth, risk still is a relevant control variable for this research. Golec’s (1992) empirical work analyzes the mutual funds’ customer and manager relationship under the umbrella of the principal-agent model. In the simplest expression of his model investors are endowed with funds and fund managers are endowed with the ability to research securities’ price information. In Golec’s (1992) model, risk sharing between the mutual fund manager and his investors defines the manager compensation. Golec (1992) believes mutual fund managers are risk averse and they require a higher salary as an incentive to run riskier portfolios. Golec (1996) brings empirical backing to his initial theoretical construct. In his findings, risk, approximated by beta and the
standard deviation of the monthly returns over the prior year, has a direct relationship to management fees. Golec (1996) also empirically identifies a statistically significant and positive association between turnover and risk. Given the intricate connection between turnover and brokerage fees, it is reasonable to consider a similar relationship between risk and brokerage fees. Hence, parting from Golec (1996) conclusions I expect risk to be positively related to brokerage fees. In essence, managers that trade more frequently are exposing their portfolios to higher risk, which in return causes brokerage fees to rise. To possibly reflect this relationship, I include the standard deviation of monthly returns over the past year in many of my models as measurement of risk.

There are other variables included at the individual fund level. The age of the fund is used in all except one of the studies cited in the literature review. The relationship between age and performance is ambiguous. The mutual fund market is heavily populated and competitive. Funds with abysmal past performance are liquidated and usually merged with other funds. However, the nexus between age and performance is unclear because it has not been established that funds that have survived for a long period of time show above average returns (Porter & Trifts, 2014). In fact, Malkiel (2013) and Porter and Trifts (2014) demonstrate mutual fund performance deteriorates overtime, partly as a consequence of increasing manager tenure and management fees. The relationship between brokerage fees and fund’s age is even less intuitive. Tufano and Sevick (1997) anticipate that younger mutual funds might experience higher costs and therefore charge their customers higher fees as a consequence of not fully realized economies of scale. Years later, Indro et al. (1999) demonstrate that mutual funds need to surpass a critical mass before they can take advantage of economies of scale. Furthermore, Tufano and Sevick (1997) also entertain the possibility of younger funds, endorsed by large sponsors, being initially marketed with lower fees to attract investors. Still, the authors find a positive and significant relationship between age and fees (Tufano & Sevick, 1997). Increasing fees could be the consequence of an increase in executives’ tenure and compensation, since management fees, director and COB compensation are all paid from these charges. To establish the relationship between age and compensation, my other variable of interests, I can
resort to price rigidity from classic Keynesian economic theory. Even in competitive markets, firms avoid cutting wages and prefer to reduce the size of the labor force because workers resent wage reductions more than seen their peers fired.

Two groups of authors, Sirri and Tufano (1998) and Prather et al. (2004), stress popularity, within individual fund characteristics, as one of the driving forces of funds’ fees; they also highlight popularity’s synergetic relationship to funds’ past performance. Intuitively funds popularity might translate into an increase in funds’ fees and a consequent increase in managers’ compensation. Additionally, popularity is the key to enter a superstar system, characterized by a highly skewed distribution of income, market share, and public attention (Rosen, 1981). A superstar system would translate into inflated manager and board compensation. Popularity in funds might not be too different from popularity in people, part of the phenomenon could be explained by past achievements and much like it happens with other types of popularity it is difficult to quantify. Sirri and Tufano (1998) introduced a new variable to measure popularity; the authors propose flow, defined as the growth of funds’ assets net of dividends’ reinvestment, as their measurement of the funds’ pulling power. It assumes that all the dividends paid during the prior year have been reinvested to grow the funds’ assets so by subtracting them from TNA considers only on new investments. According to the authors, flows are related to marketing efforts, media attention or the size of the fund parent company (Sirri & Tufano, 1998). I include flow on my study because it has an intuitive relationship with compensation. Managers that command higher flow towards their funds receive higher salaries, given the way manager fees are calculated as a percentage of TNA. Alternatively, Prather et al (2004) employ multiple instruments to approximate popularity, which they define as the funds’ demand and the capacity of the funds’ managers to accommodate such demand. Among the variables the authors use to measure popularity are multiple denominations of fund size and performance. The authors are concerned with funds’ TNA expanding too far and outgrowing the investment strategies that made the fund profitable in the first place; for instance, funds might get so large that they cannot keep investing in optimal small capitalization firms because there are not enough around
at the right value and they exceed how much they can invest in a particular firm, without pricing out any profit. Their results portray TNA as statistically significant and confirm that investing in smaller mutual funds leads to superior performance (Prather, Bertin, & Henker, 2004). I also include this measure in my regression because of the impact flow and TNA might have an impact on brokerage fees. It is reasonable if transaction costs for smaller mutual funds are higher, increasing brokerage fees. Additionally, flow might signal managers’ skills level from managers and therefore it impacts management compensation.

Fund expenses are such a vast, complex group that they deserve their own separate category. There have been many articles fully devoted to analyze fund expenses and their implications with respect to fund performance. I started this thesis echoing Kinnel’s (2014) study that identifies expense ratios as the single-handedly most important predictor of fund performance. Partly the intent of this research is to understand two mutual fund expenses, brokerage commissions and executive compensation, what drives them and ultimately how well these charges are fit in the midst of the fund’s corporate governance. The expense ratio, which is reported in the fund prospectus, is a percentage of total assets that is deducted each fiscal year to cover fund expenses. Most mutual fund expenses are included in the expense ratio: management fees, administrative fees, operating costs, 12b-1 fees, distribution costs, etc. and all other costs incurred by the fund that are accrued as a percentage of assets. The expense ratio is calculated on a daily basis and subsequently deducted from the fund's average net assets. However, brokerage commissions, other transaction costs, loads, and initial or deferred sales charges are not included in the expense ratio (Morningstar Fund Research Group, 2011). Within the umbrella of the expense ratio, management fees constitute its largest component and have increased considerably in the last few years (Malkiel, 2013). In my hand-collected cross sectional sample of mutual funds for the year 2015, management fees account for 44 percent of the total expense ratio (please refer to table II, the cross-sectional dataset descriptive statistics). Management fees mainly compensate mutual fund managers for their contribution to the performance of these investment vehicles. Hence, management fees cover portfolio’s manager compensation, research, operating expenses, and profit sharing. Next in importance
due to their magnitude, accounting for 18 percent of total expense ratio in my cross-sectional sample for 2015, are 12b-1 fees (please refer to table II, the cross-sectional dataset descriptive statistics). First introduced them in 1980, the Rule 12b-1 allows mutual funds to charge additional expenses to their customers. The 12b-1 fees are mostly a marketing or distribution expense, charged to the current mutual fund customers to promote the fund and hopefully recruit new investors and extract additional capital from existing customers. Sometimes, it also includes a portion that is destined to cover the expenses of customer services provided to the existing fund’s investors, such as 1-800 numbers and direct mail promotional materials. The Financial Industry Regulatory Agency, FINRA, self-regulates the amount of the 12b-1 fees that mutual funds charge. Combined the two portions of the 12b-1 fee can add up to as much as one percent of the fund’s assets: three quarters of one percent to cover marketing expenses and one fourth of a percent to pay for the services provided to existing customers (U.S. Securities and Exchange Commission, 2014). When 12b-1 fees are first introduced, they were presented as an advantageous level sales charge; if the distribution agent only perceives income once, at the time of the sale of the fund to the investor, then he has no incentive to ensure that the investor keeps the fund; such scenario might increase redemptions, which are expensive to existing fund customers. Paying a recurring commission to the sales force ensures that they are not only vested into selling more shares of the fund and but also interested into making sure existing mutual fund customers are satisfied. Furthermore, 12b-1 fees should grow the funds’ assets; expanding funds’ assets expedites reaching economies of scale and reduces the overall cost of operating the fund, and part of these savings might be shared with mutual fund customers. Malhotra and McLeod (1997) empirically document that this utopic scenario never actually came to fruition; at least 12b-1 fees never became an expense reduction mechanism for mutual fund customers. Moreover, two initiatives, in 2004 and 2010, failed trying to increase transparency and limit 12b-1 fees to 25 basis points or ban them completely. On February of 2013, the SEC launched an investigation concerning the hundreds of millions of dollars paid every year to brokerage firms, most of them in the form of 12b-1 fees, to help promote the sale of certain funds to retail investors. Under the current laissez-faire structure the SEC has uncovered a complex system of payments that allows mutual
funds to legally compensate brokerage firms to promote certain funds at the expense of others without clear disclosure. Allowing funds to incentivize brokers for the sale of actively managed funds at the expense of index funds. This practice was problematic even before; in 2006, the SEC prohibited fund managers from sending commission-generating trades through particular brokers in exchange for the promotion of the mutual funds they manage. A recent Morningstar study asserts that index funds now account for over 30 percent of the portfolios of equity and bond funds under active management (Alster, 2015). Given the multifaceted relationships between brokerage firms and mutual funds’ parent companies even regulators face an arduous task trying to decipher the nature of the payments. There are no clear requirements on the extent of information mutual funds and brokerage firms need to report to their customers in terms of the sale commissions they pay or charge so investors face great disparity in disclosures and an overall lack of transparency. Additionally, commissions charged by brokerage firms to mutual funds’ sponsors in order to market their products keep raising, for instance, Ameriprise Financial Services received a record figure of more than $210 million from 29 fund companies for shelf space in 2013. However, SEC commissioners are conducting an ongoing analysis on 12-b 1 fees and several mutual fund officials fear that it could lead to an overhaul of how the fund industry pays sales commissions and how the brokerage industry discloses the money it collects (Horowitz, 2014).

To gain more insight on the impact different types of mutual funds costs have on brokerage commissions and executive compensation, the expense ratio values provided by CRSP required a small adjustment. I separate expense ratios in three components: management fees, 12b-1 fees and the remaining expenses. As mentioned above, the 12b-1 fee-component measures the impact of marketing efforts to increase TNA, management fees represent the payment to mutual fund managers in exchange for their efforts to increase TNA through higher returns, and the rest is mostly administrative expenses and other costs of running the fund. I expected management fees to increase directly in proportion to managers’ compensation. Extracting management fees and 12b-1 fees from the ratio helps mitigate endogeneity concerns and allows me to differentiate the impact of all three components on my dependent
variables. All the expenses provided in the SAI and prospectus, available through CRSP, are heterogeneous and they vary with share classes. I harmonize the expenses, given the different share classes, by selecting only class B shares when available. I selected class B shares because, unlike class A shares, they typically do not carry a front-end sales charges; since load charges depend on the amount invested, adding loads to the expense ratios required setting an artificial investment amount. To compensate for the lack of front-end loads, class B shares impose 12b-I fees, which may be higher than the ones associated with class A shares (Financial Industry Regulatory Authority, 2008).

Once the main components of expense ratios are explained I turn my attention to the way they are allocated to each fund. The conundrum here is to decide if expense ratios should be considered at the individual fund level or at the sponsor level. For instance, it is important to establish if mutual fund sponsors are allocating expenses to individual funds given their individual characteristics such as the complexity of the investment objective or their size. Alternatively, if parent companies decide to amortize mutual fund expenses across individual funds, they could assign the same expenses regardless of the fund traits. It is reasonable to assume that although mutual fund families have a decisive impact on the types and level of expenses charged by mutual funds, this allocation might not be done arbitrarily and it based on certain fund attributes that easily justify the allocation of the overhead costs. From the articles I could find, relevant to this research, all analyze mutual fund characteristics at the individual fund-level. In this respect Blundell et al. (1996) defend the use of individual firms when modeling company investment. They recall an increase in panel data parallel to a resurgence of econometrics techniques designed to deal with this type of data. The authors propose using individual firm observations instead of aggregating the data across firms; the use of individualized firm data reduces aggregation biases, allows one to consider heterogeneity across firms, and the cross-sectional variation helps to increase accuracy in the estimated parameters. Cross-firm differences allow to measure the variables of interest with more precision and the researcher can obtain a deeper insight from the process (Blundell, Bond, & Meghir, 1996). This dichotomy between individual funds and fund families is at the core of mutual fund fees’
determinants, and arguments can be made in favor of individual mutual funds distilling a large portion of their cost structure from their parent investment firms. However, this focus is a departure from the traditional study of fund characteristics at the individual level, most likely any empirical findings would be mostly consistent with prior literature at the individual fund-level. In this respect, Iannotta and Navone (2012) suggest an analysis of variance, ANOVA, model to help recognizing to what extent the different fees charged by mutual funds are established at the fund level or at the family level. Their findings make the argument for using individual fund characteristics, approximately only 40 percent of fee dispersion can be explained by the fact that the fund belongs to a particular family; on the contrary, the majority of fee dispersion, 46 percent, is allocated at the individual fund level. It is worth mentioning that the focus of their analysis is fee dispersion among class shares of an individual fund and not fee determination.

These results offer enough validation to continue with their model and cluster errors at the individual fund level (Iannotta & Navone, 2012). The expense ratios included in all of my models are also taken at the individual fund level and not at the sponsor level. I am afraid that valuable information might get lost so when the variables are introduced in aggregate terms. I introduce clusters by family and investment objective.

Most mutual fund investors are familiar with load charges and expense ratios, but many mutual fund customers are unaware of the hidden costs that they have to pay to support the active management of their portfolios. Among of the most obvious components of these hidden costs are brokerage fees. Brokerage commissions are paid to brokerage firms to execute the transactions defined by mutual fund managers. Therefore, brokerage fees increase as a result of the mutual fund managers buying and selling activity. Brokerage firms compete for fund flows, partly through competitive bids but also by offering research services in return of the funds’ business. Competing not only in price but also in differentiated services allows brokerage firms to charge higher commissions. Given the special nature of the brokerage industry mutual funds are not required to minimize their brokerage commissions nor do they need to report them in their expense ratios or include them in their prospectuses. One way investors can keep
track of the brokerage expenses is by paying attention to the funds’ turnover rate. The funds’ turnover rate, available in the funds’ prospectus, provides a measurement of the trading activity in the funds’ portfolios. It represents the proportion of funds’ holdings that are replaced in a specific year. It traces the changes in the funds’ holdings through buying and selling. The rate is calculated by dividing the lesser of purchases or sales in a fund’s portfolio, by the average value of its net assets. According to the Investment Company Institute, the average asset-weighted turnover rate between 1980 and 2013 is 61 percent. Funds with a turnover of more than 100 percent make enough transactions to replace their entire portfolio more than once a year. Compared to the average of the past 34 years, the 2015 asset-weighted annual turnover rate of 44 percent is considerably lower, with almost half of the total assets in funds with portfolio turnover rates below 29 percent. Although this level represents a seven percent increase from 2014, the industry-wide trend observed during the last few years is of a significant reduction in turnover ratios. Nowadays, investors tend to favor funds with low turnover; there is an increasing flow of assets towards equity funds with relatively low turnover rates (Investment Company Institute, 2016). In my cross-sectional sample, for the year 2015, the median turnover ratio is 51 percent. This figure is consistent with the decreasing trend reported by the Investment Company Institute for 2015 and testifies to the representativeness of my sample. Investors might be getting savvy about turnover ratios, because constantly replacing stocks or bonds carries commissions and has other transaction costs, such as bid-ask spreads, capital gain taxes, and negative price impacts. However, it is difficult for investors to determine if and when turnover stops being beneficial. Proponents of behavioral finance might see high turnover as a symptom of overconfidence, which occurs when investors overestimate their abilities and the extent of their knowledge and keep trading despite poor performance (Bodie, Kane, & Marcus, 2009). Barber and Odean (2001) cite overconfidence, especially among single male traders, as the main reason for excessive trading, which is highly predictive of poor performance. High turnover also increases short-term capital gains; even if the investor has not owned the asset long enough to benefit from the stocks’ appreciation, he is taxed for any of the gains resulting from the sale (Malhotra & McLeod, 1997). In conclusion, high turnover ratios translate into higher costs and therefore temper net fund performance. Several analysts
suggest that brokerage fees might be underestimating the cost of transacting within actively managed funds. Certain mutual fund customers might also face market impact cost, which is observed when large transactions executed by mutual funds cause adverse movements in assets’ prices before the order is completely filled. Similarly, additional transaction costs known as spread costs occur when managers execute transactions at prices that are subpar from the best bid or ask quoted prices (Bernicke, 2011).

However, this modern vision of portfolio turnover as a cost generating proposition is not always generally accepted; Golec (1996) views turnover as a proxy for management effort and expects to see a positively relationship between turnover ratios and fund performance. Moreover, the author’s empirical findings confirm a positive relationship between turnover ratios and management fees but his results lack statistical significance. Nevertheless, I supplement the expense ratios and turnover measurements, provided from CRSP, with manually collected brokerage fees and corporate governance measures, to gain insight on how mutual funds function and the role that corporate governance plays in their operations.

Finally, cash holdings is another hidden cost of owning a mutual fund that is most likely overlooked by the majority of mutual fund investors and that it is also ignored by many researches in my literature review. Malhotra and McLeod (1997) consider cash holdings as an expense to mutual funds customers. The cash ratio measures the proportion of cash held on a fund portfolio with respect to its investments in return-baring assets such as stocks or bonds. Mutual funds are required to maintain a certain percentage of cash in hand to respond to potential redemptions by customers. This necessary liquidity exposes a tradeoff between the lost return that could have been earned by investing that cash and not having to get out an investment position incurring in transaction costs with every customer’s withdrawal. As Malhotra and McLeod (1997) note, 12b-1 fees are introduced to increase the stability and size of mutual funds and therefore to reduce the need for keeping idle cash to meet redemptions. The authors expect the cash ratio to reduce expense ratios because it should attenuate the costs of redemptions; however, their findings are only partially statistically significant and contradict their hypothesis supporting a direct relationship between expense ratios and cash holdings. O’Rielly and Preisano (2010)
allocate a large portion of the underperformance of actively managed funds to the level of cash balances that fund managers keep in their portfolios. They use a sample of approximately 540 equity funds, extracted from Morningstar, evenly distributed in terms of their investment objective between large and small capitalization, over a ten-year period starting in 1989. The authors quantify that maintaining a yearly average cash ratio of 6.75 percent a year for the large-cap funds and of 7.1 percent for the small-cap funds, costs mutual fund customers an average of 83 and 74 basis points in lost performance a year respectively. It is not difficult to realize that the impact of the cash balances is only magnified for funds performing better than average (O'Rielly & Preisano, 2010). In my cross-sectional sample, the median amount of cash kept by the funds is 1.21 percent. However, considering that the median return for the same sample is of -4.82 percent, the average investor in these funds might have been better off with an even higher level of cash holdings. Indirectly, cash balances also make actively managed mutual funds even more expensive because expense ratios are calculated as a percentage of total assets even though not 100 percent of assets are actually invested and actively managed by the portfolio manager. In fact mutual fund customers also pay expense ratios on the funds’ cash holdings. Keeping cash on a bank account does not bear much return but at least it is not penalized with large expenses yet. Furthermore, the investors that are most vulnerable to the malign effect of cash holdings are among the most loyal customers of the fund; investors that pursue a buy and hold strategy are penalized by the liquidity needs of other mutual fund customers (Bernicke, 2011). Alternatively, customers who pay more taxes as a consequence of investing on a mutual fund when funds are owned outside of a tax-deferred account also incur in additional hidden expenses. However, these expenses are difficult to quantify and therefore are beyond the scope of this research.

Since this study analyzes the impact that corporate governance has on brokerage fees and executive compensation, I collect several more variables that serve as a proxy for the funds’ corporate governance structure than for any other category. Expanding the research into corporate governance also allows me to hypothesize about the likelihood and extent of information asymmetry or agency conflicts
that might exist in the mutual fund industry. Iannotta and Navone (2012) cite asymmetry of information as a possible explanation for the extreme fee dispersion present in the mutual fund market. Such large fee dispersion is hard to reconcile with the enormous number of existing mutual funds and the intense competition that one would expect prevails in this market. Adams et al. (2012) contemplate about the presence of high agency costs in the mutual fund industry; in this environment a strong corporate governance structure could deter excessive fees. Agency costs are also accentuated by the potential conflict of interests derived from the unique structure of mutual funds. Mutual funds are independent legal entities; directors are in charge of governing mutual funds and are their only direct employees. However, the mutual fund parent company, appoints the mutual fund manager, manages the funds, and elects the funds’ directors (Adams, Mansi, & Nishikawa, 2012). The level of interrelationship between directors and mutual fund sponsors may raise potential conflicts. Analyzing the board’s structure and characteristics help assessing the strength of the governance structure in place and its capacity to protect individual mutual fund investors from excessive fees. Contrasting my variables of interest with the corporate governance characteristics would make possible, for instance, to differentiate between rent seeking behavior, from managers and non-independent directors, and fair market compensation; in other words, whether executive compensation is derived from market equilibrium or the consequence of opportunistic behavior. The financial literature has often paid attention to the number of seats on the board as a revealing factor of a firm’s corporate governance. The argument is that boards that are too large might lack focus as managers or be less effective monitoring the firm, while constituting a bigger expense to shareholders (Lipton and Lorsch, 1992; Jensen, 1993). Although directors are the only employees of mutual funds, it appears that the decision of how many directors to have per board rests largely on mutual fund families. Tufano and Sevick (1997) believe that decisions regarding board structure, i.e. board size and director compensation, are organic and they reflect other fund family characteristics. Accordingly, I examine whether the number of directors on the board is related to the level of compensation and brokerage fees paid by funds. Tufano and Sevick’s (1997) results confirm that larger boards tend to charge higher fees. The authors interpret lower fees as a result of more effective
boards, and therefore their results validate the preceding literature (Tufano & Sevick, 1997). Adams et al. (2012) second Tufano and Sevick’s (1997) results and find a positively relationship between fund size and expense ratios; however, this relationship is only statistically significant when the fund offers multiple class shares.

The mutual fund industry is one of the most heavily regulated industries given its size, $15.7 trillion in assets in the U.S in 2015, and its economic importance; it represents about five percent of the entire country net savings (Investment Company Institute, 2016; The World Bank, 2015). The aforementioned Investment Company Act of 1940 is the most important regulatory guideline governing mutual funds’ boards. As in any other industries, this law establishes the board of directors’ responsibility to monitor potential conflicts of interest between the fund’s customers and sponsors. Unlike any other industry, the Act requires at least 40 percent of independent directors on a given board. Furthermore, independent directors alone must approve relevant aspects of sponsors’ contracts including management fees. The Act defines an independent director as an individual that has not been in a business relationship with the fund sponsor, its distributors or underwriters for at least two years. The definition of business relationship also includes owning stock of the investment adviser or related entities. However, most mutual funds greatly surpass the board independence requirement; by 2013, almost 90 percent of mutual funds independent directors account for at least 75 percent of board seats (U.S. Securities and Exchange Commission, 2014). In my cross-sectional sample of mutual funds, extracted from the 2015 fiscal year, I find that, on average, independent directors occupy approximately 82 percent of board seats. I examined whether the number of independent directors on the board or having an independent chair is related to the level of compensation the fund pays, the amount of brokerage fees it charges, or its performance. Tufano and Sevick (1997) find that the proportion of independent directors in a fund’s board is negatively related to the fund’s expense ratio. Accordingly, Adams et al. (2012) share that the number of independent directors significantly impacts fees in funds with multiple share classes. However, the authors hint that independent directors might not monitor all different share classes with the
same intensity, the board might focus its efforts on the most popular shares leaving others with disproportioned fees (Adams, Mansi, & Nishikawa, 2012). Adams et al. (2012) find that almost 40 percent of mutual funds in their sample have an independent chair; surprisingly, their results indicate that having an independent chair results in higher fee spreads and higher deferred loads. I also consider whether the range of portfolio shares owned by directors and the type of sponsor ownership influence the level of compensation the fund pays, its fee structure, and performance. Tufano and Sevick (1997) follow the long tradition in the financial literature, outside of the realm of mutual funds, of studying boards’ traits as possible determinants of corporate governance and boards’ decision-making. However, when they publish their study in 1997 the information regarding mutual fund directors’ holdings is not readily available and, regretfully, they could not include it in their models. In the financial literature, the level of CEO’s firm ownership ranges between entrenchment and interest alignment. Hence, I test whether COBs and directors, who invest in the funds’ portfolio, are more likely to represent the interests of mutual fund customers. Two recent studies bring light into this question; in both articles the authors verify whether mutual fund executives and other employees ‘eat their own cooking’. Dvorak and Norbu (2013) analyze the options in 401(k) pension plans offered by mutual funds’ parent companies to their employees. The authors find significant differences between the mutual fund sponsors that offer their own plans exclusively and the ones that include external options. Poor corporate governance and comparatively higher fees on the mutual funds they sell usually characterize mutual fund families that offer external investment retirement options to their employees. The authors perceive this evidence as symptomatic of the conflict of interests embedded in mutual fund sponsors, which appears self aware of the fact that their fees are excessive (Dvorak & Norbu, 2013). After the SEC started requiring mutual funds to report their holdings on the funds they manage, Kinnel (2008) taps into this relatively new information to analyze how well invested, figuratively and literally, managers are into their own portfolios. The author reveals that approximately half of the managers of domestic equity mutual funds have no investments in the funds they managed, and that the ratios are even worse for managers of international and fixed income funds. Kinnel (2008) interprets this information as an indication of the lack of confidence managers have
in their own skills and questions whether anyone should invest in those disowned funds. He suggests investors to consider this information, the level of manager investment, when deciding where to invest their money. He also notes that funds with a high manager investment range often coincide with funds that have received high rankings from Morningstar oval (Kinnel, 2008). Similarly, in many cases, the financial literature has confirmed a positive relationship between director ownership and firm performance (Morck, Shleifer, & Vishny, 1988; Bhagat, Bolton, & Subramanian, 2010). Since the level of fees directly affects fund performance, the relationship between director ownership and performance should translate into the mutual fund industry. It is important to notice that although ownership information is reported per individual director, the exact amount is not disclosed, instead, mutual funds report several possible ranges of ownership to which the directors conform. The SEC considers these ranges provide mutual fund investors with sufficient information to determine how vested to the funds mutual fund executives are (Brown S. L., 2017). A categorical variable is included to identify accumulated independent board members ownership ranges. Regarding ownership, the nature of the sponsor ownership that manages the individual funds has also gathered considerable attention on the mutual fund literature. This study includes a categorical variable to distinguish between public and private ownership. Regarding only index funds, Adams et al. (2010) empirically support lower overall expense ratios for funds offered by publicly held sponsors. Nevertheless, Adams et al. (2012) find that privately held sponsors are as likely as publicly owned ones to offer multiple share classes. However, the authors find that in their models the publicly held dummy, which takes a value of one if the fund family is publicly owned, has a large significant and positive impact on the fund fee dispersion. In fact it is the single most important factor increasing fund fee dispersion by as much as 28 basis points, on average. A year later, Adams et al. (2013) find that publicly owned sponsors are more performance sensitive and they are more likely to substitute portfolio managers after a period of subpar performance. The debate around this situation echoes a public statement by Vanguard Group mutual fund family’s founder and retired CEO, Mr. John Bogle. Mr. Bogle in several occasions has shared his concerns regarding public ownership in the mutual fund industry and its potentially negative impact on mutual fund fees (Bogle,
My results confirm that the nature of the parent company ownership plays a significant role as a determinant of brokerage commissions and to a lesser extent of executive compensation and performance.

Finally, within corporate governance characteristics I considered director and COB compensation and other individual traits. Tufano and Sevick (1997) mention in their research the importance of including directors personal characteristics in the statistical models; however, the dataset they use, provided by Lipper Analytical Services, at the time, did not provide some information that the authors feel it is important to include, for instance: directors’ age, tenure, or the number of seats held by directors, etc. I manually collect all of these attributes for COBs and directors as part of my analysis, which also includes additional traits such as gender, education, fund ownership, etc. Given the limitations in their data, what the authors do instead is to focus on director compensation; in particular, they are interested in whether relatively high-paid directors are more likely to approve higher fees; I pursue the same task. Mutual fund sponsors can make it worthwhile for independent directors to conform by offering them to oversee many funds within the same family; for independent directors more funds translate into higher salaries. In exchange for higher salaries, directors might allow sponsors to charge higher fees, on a quid pro quo basis. Directors can cement a long mutually beneficial relationship with sponsors making the interests of anonymous ever-changing mutual fund customers less of a priority. Alternatively, Adams et al. (2012) propose that well-paid directors might be beneficial to mutual fund customers if they develop specialized skills providing a vigilant oversight of the fund operations and questioning its fees. Higher salaries might signal, to sharp investors, the quality of the board monitoring and negotiating skills. Limiting their sample to index funds, Adams et al. (2010) find significant differences between publicly and privately own sponsors with respect to their directors’ compensation. The authors believe that the severity of potential agency costs is higher for publicly owned sponsors, thus the benefits of board monitoring are greater. Funds under a publicly owned sponsor pay a higher salary to their directors. The authors report a median compensation per director of $64,000 for privately owned funds compared to a median compensation of $85,000 for publicly owned funds (Adams, Mansi and Nishikawa, 2010).
According to my hand-collected cross-sectional sample of mutual funds, during 2015 median director compensation reaches $1,877.50 per individual fund and $244,000 in aggregate terms from the entire complex. Moreover, these individual characteristics extracted from the mutual funds’ SAIs regarding director and COB are: age, tenure, education, the number of portfolios under supervision, range of portfolio shares owned by the executive, and the compensation the board receives for their services. Other information available in the 485 and 497 filings includes director and COB ownership range on the mutual funds they supervise and the number of mutual fund boards in which they occupy a seat, which I also compile. Adams et al. (2010) focus on directors’ attributes using a manually collected set of index funds to study the relationship between performance and board characteristics. First, the authors consider characteristics traditionally identified as directors’ time constraints such as retirement status, number of funds overseen, and outside directorships. Nevertheless, they do not find any these attributes to have an influence on the funds’ performance. Furthermore, the authors also study the impact on performance of director’s characteristics commonly identified as director-shareholder alignment proxies such as: tenure, fund ownership and compensation. They reach the same conclusion, lack of clear links to performance. Therefore, they conclude that boards’ ability to mitigate agency costs is not compromised (Adams, Mansi, & Nishikawa, 2010). Expanding my sample beyond index funds and given my slightly different focus allows me to gain insight on the impact of directors’ traits, their compensation, and the funds’ fee structure on mutual fund performance.

Finally, I also consider the managerial structure of mutual funds using a few manager characteristics: age, tenure, and compensation. Building upon the prior research on CEO compensation, my analysis encompasses not only whether the managers’ compensation and management characteristics are related to portfolio turnover and brokerage fees, but also the influence of corporate governance and mutual fund expenses on managers’ compensation. Furthermore, I examine the validity of criticisms frequently brought against actively managed funds. I test whether managers receiving higher salaries are capable of obtaining superior performance, or if higher manager compensation just constitutes a bigger net expense for mutual fund customers in the form of larger management fees. I analyze the relationship
between managerial performance and corporate governance characteristics after controlling for fund size, investment objectives, risk, fund expenses, sponsor ownership, and other funds’ characteristics that influence fund performance as indicated before by the financial literature. The quest to clarify the association between managers’ compensation and performance appears justified. Managers’ compensation is partly derived from the mutual fund assets, creating an incentive for managers to increase the size of the portfolio. The sponsor can increase the funds’ assets using marketing efforts; however, managers can only increase the level of funds through superior investment skills that grows the portfolio. Hence, managers that are capable of improving fund performance should be compensated for their efforts. Continuing the debate about a possible dichotomy between publicly and privately owned sponsors, Adams et al. (2010) raise a question about managers’ compensation and other managerial attributes. The authors wonder if the labor market is partly responsible for the allocation of managers in specific funds. It is possible that managers with certain traits decide to place themselves into specific funds because of their career choices such as higher compensation or less board supervision. Such situation might raise endogeneity concerns about the validity of using managers’ characteristics combined with managers’ pay under certain methodologies (Adams, Mansi, & Nishikawa, 2010). Even though the CEO literature traditionally deals with these situations the CEO labor market might be even more restricted than the mutual fund manager labor market, limiting such career decisions. Close attention is required on my part to ensure that endogeneity concerns are minimized.
V. ii. Models

V. ii. a. Cross-sectional Models

In order to provide a snapshot of a larger distribution of the patterns in mutual funds I collected a cross-sectional dataset for the most recent fiscal year, 2015. To analyze this sample, I implement four different methodologies: ordinary least squares (OLS), robust regression, heteroscedasticity-consistent (Huber-White) regression with robust standard errors, and finally a regression clustering the standard errors with respect to mutual fund families. My concerns are the violations of the classic assumptions of the OLS regression method, in particular: independence of the regressors and homoscedasticity. As explained in the data and variable sections, several of the variables I garnered might share common determinants; for instance, the corporate governance characteristics or board traits might have a common core, being influenced by the same parent company corporate culture; hence, it is appropriate to check for the possible lack of independence among observations, as reflected by the correlation in the residual error terms. Since the intent of this thesis is to do the groundwork to gain understanding of the determinants and characteristics of both brokerage commissions and executive compensation, one possible concern is the existence of outliers or leverage values that might taint the dependability of the results. As noted by Plümper and Troeger (2007), corporate finance data has its own set of intrinsic characteristics. In my case, perhaps their concerns apply to my variables related to executive compensation and mutual fund expenses. Such variables might be concentrated around specific ranges of values or susceptible to be informed by prior values. Hence, implementing more sophisticated methods of regression is necessary to mitigate departures from the OLS classic assumptions and to cement this newly gain insight (Plümper & Troeger, 2007).

Furthermore, in addition to analyzing the entire cross-sectional data using four different methodologies I extend my analysis by applying these four statistical methods onto two additional sub-
samples taken from the initial cross-sectional sample for the year 2015. I generate two additional cross sectional pools; the first one is restricted to 845 unique observations by eliminating all index funds from the entire sample, and the second one includes 819 unique observations obtained by retaining only mutual funds that charge 12b-1 fees from the entire population of mutual funds that I collected. Excluding index funds from the analysis might prove useful; since index mutual funds charge comparatively lower fees than their peers. Malkiel (2013) testifies to the growing popularity of index funds and other passively managed investment vehicles in response to the increasing awareness from part of investors of the perils caused by the large fees charged by professionally managed funds. The popularity of index funds expands to not just savvy mutual fund investors, according to a recent study developed by Morningstar, the assets currently invested in index funds now account for over 30 percent of the total assets invested in all equity and bond funds under active management (Alster, 2015). According to the table II, the cross-sectional dataset descriptive statistics, index mutual funds account for 34 percent of my cross-sectional sample, this figure is a testament to the representativeness of my sample. The second sub-sample focuses on mutual funds charging their customers with 12b-1 fees, the marketing and sales services expenses, which has been proven not to add any value for investors (Malhotra & McLeod, 1997; Iannotta & Navone, 2012). As mentioned in the data section, mutual funds have complete leeway when deciding if and how much to charge customers for these fees. Therefore, I make the argument that mutual funds that decide to charge their existing customers 12b-1 fees, are more likely to show weaker corporate governance characteristics and a stronger bond with other mutual fund expenses. Despite the possible decrease in statistical significance that one might expect as a consequence of considerably reducing the number of observations from the sample, the nexus between brokerage fees and corporate governance or other expenses and between executive compensation and corporate governance or other expenses as presented by all my hypotheses remains strong. In conclusion, when selecting this sub-sample to implement my analysis, by design the case presented here is that funds that charge 12b-1 fees might have a different corporate governance culture, or implement more lenient controls, which might strengthen the
results observed in the regressions from entire sample. At the very least this additional analysis should prove that funds charging 12b-1 fees behave more homogenously as a group.

First, I approach the data using an OLS regression because it is the traditional departure for any cross-sectional analysis. I also use these results as the baseline model to compare the output of the additional regression methodologies that I implement trying to circumvent possible violations of the classic OLS assumptions. According to Plümper and Troeger (2007), OLS regression works surprisingly well when the main focus is the estimation of the coefficients as long as the data is not populated by time-variant variables. Because the purpose of this study is to identify the effect of the regressors in a set of unexplored mutual fund variables, and since I have cross-sectional data related to only one period, using OLS is appropriate according to Plümper and Troeger’s (2007) recommendations. By implementing OLS estimation I am trying to identify how much of the variability of brokerage commissions, director and COB compensation can be explained by other mutual fund characteristics while minimizing the residuals, or the unaccounted portion of our regression. OLS accomplishes this task by minimizing the sum of squares between the observed values and the predicted observations (Wooldridge, 2009). However, OLS also has restrictive assumptions, which might not always be met by standard corporate finance data. To account for these possible departures from the classic assumptions three additional methodologies are implemented.

When the characteristics of the observations in the sample are not necessary compatible with the assumptions of the classic OLS regression model, the results are estimators that depart from the populations’ values, providing coefficients that are potentially biased and also inaccurate standard errors. I run two different types of regressions: the first type requires robust estimation of the coefficients and the standard errors as introduced by Huber (1973), and the second one focuses on more reliable estimation of the residuals when heteroscedasticity concerns are present following White (1980) (Huber, 1973; White, 1980). In both regressions, the estimations of the standard errors are closer to meeting the assumptions of independence and homoscedasticity of the residual errors if any of such deviations exist. The robust
regression I implement uses a weighting method to address outliers and leverage points or influential observations such that it minimizes their impact on the regression output. Outliers are observations that show large departures from the predicted values, i.e. abnormally high or low responses. Alternatively, influential observations or leverage points are data entries that perform in unusual ways compared to their peers; a data point is considered a leverage observation if it presents a very different value compared to all the other observations in the data, not necessarily because of its extreme magnitude. First, to circumvent the effects of outliers and leverage observations weights are computed using Cooks’ approach, which takes into consideration each individual observation’s departure from the predicted value and its leverage. Next, during the robust regressions process, the newly computed weights are assigned to each individual observation; higher weights are assigned to individual data points that are consistent with the overall pattern of the data, while observations with large residuals or unusual behavior receive lower weights. In extreme cases, outliers or influential observations are completely removed from the regression by assigning them a null weight. Finally, when the independent variables’ coefficients and standard errors obtained from this form of robust regression do not departure dramatically from the ones provided by the output of the linear standard OLS regression, it can be concluded that the impact of outliers and influential observations in the sample must be minimal and confidence in the validity of the coefficients could be regained (Kutner, Nachtsheim, Neter, & Li, 2005).

Alternatively, a third type of regression centers on the estimation of the residual errors to primarily address concerns of lack of homoscedasticity in the sample following the work of White (1980). Heteroscedasticity relates to the presence of significant differences in the variance of the residuals across different segments of the population; having a large sample size does not help mitigating this problem. Heteroscedasticity in my sample is possible, given that the funds included are a fairly heterogeneous group; within my sample, there are mutual funds with different investment objectives, extracted from diverse families, wide variety of asset sizes, ample age disparity, etc. For instance, one could argue that mutual funds that are mainly invested in equity are going to experience more variability than those who
are fully vested in fixed income securities. The main obstacle caused by the possible presence of heteroscedasticity in any sample is that the estimators are no longer unbiased. The presence of biased estimators also has an effect on the assessment of the both the t-statistics and the F-statistics challenging the validity of the statistical significance of any analysis. To confront this problem, an additional regression methodology provides heteroscedasticity-consistent standard errors, which allows for a more rigorous assessment of the statistical significance of the regressors’ coefficients provided by the analysis. Once again, when the independent variables’ standard errors obtained from this form of heteroscedasticity-consistent regression do not significantly differ from the ones obtained of the linear standard OLS regression, the possibility of heteroscedasticity in my sample may be disregarded and the accuracy of the values obtained from standard OLS linear regression analysis could be restored (Kutner, Nachtsheim, Neter, & Li, 2005).

Finally, the last type of regression that I run using my cross-sectional sample accounts for a possible lack of independence in the error terms. The main argument that one could make to justify correlation among the error terms is that mutual funds pertaining to the same family are most likely going to share characteristics with other mutual funds from the same family; for instance, in terms of corporate governance. As explained in the data section, several mutual funds from the same parent company share the same board across. Even though independent directors from one particular mutual fund board might also be members of the board of another mutual fund not belonging to the same family, the corporate culture within funds of the same family will permeate more determinedly. Failing to acknowledge the existence of correlation among the error terms, caused by group membership, may result in lack of accuracy in the estimation of the standard errors. In a linear standard OLS regression all individual observations are considered as independent. If the observations’ group influences their characteristics, the regression is going to underestimate the actual variability among observations, which is much larger outside of the mutual fund family. Without clustering, standard errors accuracy of inference decreases. Underestimating the variability of the residuals artificially boosts the statistical significance of the
coefficients in the regression prompting deceiving conclusions and spurious relationships. By clustering the observations by family group, provides more reliable standard errors. Since the clustered standard errors account for the different nature of the variability among observations sharing the same family against nonmembers, each new estimation of the clustered standard errors is going to be larger than the standard error’s from the standard OLS linear regression for the same specific variable. When the independent variables’ coefficients and standard errors obtained from this mutual fund family clustered-errors regression are not substantially apart from the ones provided by the output of the linear standard OLS regression the importance of the within family variance versus the inter family variation in the sample is not that pivotal and confidence in the validity of the standard OLS coefficients should remain (Wooldridge, 2009).

V. ii. b. Panel Models

The statistical models presented below use the panel dataset hand-collected for the purpose of this dissertation, which includes over 2,800 unique year-mutual-fund individual observations over a period of 17 years, covering the period 1998 – 2015, representing approximately 165 mutual funds per year. The intent of these analyses is to identify the determinants of mutual funds: brokerage commissions, executive compensation, and performance. This section presents the three main alternative methods designed to deal with the particularities of the data: fixed effects regression, generalized method of moments following Blundell and Bond’s (1998) methodology, and heteroscedastic regression as introduced by Harvey (1976).

In a recent article, Flannery and Hankins (2013) discuss the particularities of the type of data researchers usually face on the field of corporate finance. The authors recall an unprecedented increase in the use of dynamic models for panel data in corporate finance research parallel to the popularization of the Compustat and CRSP datasets. Corporate finance datasets have many elements that could possibly
result in biased estimates using common analytical methods such as OLS or Fixed Effects (FE). Monte Carlo simulation suggests that lengthier panels and advanced econometric techniques could correct severely biased estimation of independent variables. However, as Flannery and Hankins point out, the type of data and models that are common in corporate finance commonly include: numerous regressors, endogeneity problems, serial correlation, short time horizons, unbalanced panels, missing observations, and censored or clustered dependent variables (Flannery & Hankins, 2013).

As it is already stated in the data section, the frequency of the 485 and 497 filings is the defining factor of my data frequency. Most of the variables are only available on a yearly basis. Using yearly data carries certain connotations; mainly, my methodologies have to be robust to short-panel biases. However, increasing the frequency of the data sometimes also has detrimental consequences, particularly for corporate governance data, more frequency in the data might provide more observations of the same time-invariant variables with the same values, increasing the difficulty of estimating them accurately (Flannery & Hankins, 2013). Longer panels are better in general but having small or null innovation in the regressors is harmful and impedes estimating accurate coefficients. Towards the end of this methodology section, the Blundell and Bond (1998) model is introduced as a robustness test because it eludes some of these concerns. This methodology, praised by Plümper and Troeger (2007), is specifically tailored to deal with time-invariant or rarely changing variables in finite sample panel data with unit fixed effects.

Given the multi-year multi-fund structure of my data I need to implement panel data techniques to test my hypotheses. When using panel data, a reasonable alternative to OLS is to employ fixed effects, FE, to control for year and individual fund or family characteristics. Fixed effects controls for time-invariant differences across mutual funds. According to a recent study of dynamic panel models in corporate finance, under most circumstances FE performs quite well compared to other more complex econometric techniques if the main focus of the researcher is the estimation of the independent variables parameters, except when estimating lagged dependent variables as regressors or the panel is unbalanced (Flannery & Hankins, 2013). Fixed effects models avoid, to certain extent, an omitted variable problem
when dealing with non-experimental data. Excluding a crucial regressor in OLS regressions has severe
effects; mainly it causes biases in the estimation of the variables included. Fixed effects methodology
allows to control for fund specific time-invariant characteristics that would have been neglected in my
models because they are specific across individual observations, time-invariant and difficult to pinpoint.
One of the possible drawbacks of using FE is an increase in the sampling variability relative to alternative
methods of analysis. Fixed effects completely ignore the between-fund variation and focuses exclusively
on the within-fund variation (Wooldridge, 2009). Disregarding the between-fund variation can yield
standard errors that are considerably higher than those produced by alternative methods that consider both
within and between fund variations (Allison, 2009). This increase in standard errors might cause lack of
statistical significance in certain variables once they are estimated using the FE methodology. Since
managers and directors stay in the same position for several years it is possible that this dynamic panel
dataset is correlated over time and across funds within the same family. To circumvent this situation, FE
estimation, with fund-level clustered errors, accounts for possible temporal effects and avoids potential
considering a clustered errors approach; clustered errors are the result of using clustered data, i.e. when
one expects for the outcomes from the same cluster to be positively correlated. It is possible to assume
that I do not have completely independent observations since I am using the same mutual funds over time;
thus, one must take into consideration this possible built-in correlation. Failing to include the possibility
of correlation among the residuals that are extracted from the same fund will cause biases in the statistical
inference. OLS estimation considers each observation as independent; however, in this case that will
induce to an overestimation of the precision of the coefficients. The standard errors under the
Generalized Estimation Equation (GEE) approach will be bigger than what OLS suggests. The GEE
approach is an extension of the generalized linear model method, GLM, which allows for correlation in
the data such that valid standard errors of the parameter estimates can be drawn. Thus, I employ year and
fund fixed effects regressions on mutual funds with brokerage commission data available. I control for
multiple variables that have appeared to be significant, with respect to expense ratio determination, in the
previous literature. Hence, the initial approach is to regress brokerage fees using FE to determine the importance of corporate governance, captured by my system of corporate governance variables, after controlling for an array of fund specific and family variables. These regressions aim to establish the determinants and to clarify the impact of corporate governance structure on brokerage fees. I use this methodology to test all hypotheses. I am still left with possible endogeneity concerns between time-varying fund characteristics and the corporate governance measures that are selected as regressors.

\[ \text{Brokerage Fees}_i = \alpha_i + \beta_1 \text{Fund Characteristics}_{i,t} + \beta_2 \text{Corporate Governance}_{i,t} + \beta_3 \text{Fund Turnover}_{i,t} + \epsilon_i \] (1)

\[ \text{Brokerage Fees}_i = \alpha_i + \beta_1 \text{Fund Characteristics}_{i,t} + \beta_2 \text{Expense Ratio}_{i,t} + \beta_3 \text{Fund Turnover}_{i,t} + \epsilon_i \] (2)

\[ \text{Dir. Comp}_i = \alpha_i + \beta_1 \text{Dir. Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Corporate Governance}_{i,t-1} + \epsilon_i \] (3)

\[ \text{COB Comp}_i = \alpha_i + \beta_1 \text{COB Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Corporate Governance}_{i,t-1} + \epsilon_i \] (4)

\[ \text{Mngr. Comp}_i = \alpha_i + \beta_1 \text{Mngr. Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Corporate Governance}_{i,t-1} + \epsilon_i \] (5)

\[ \text{Dir. Comp}_i = \alpha_i + \beta_1 \text{Dir. Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Expense Ratios}_{i,t-1} + \epsilon_i \] (6)

\[ \text{COB Comp}_i = \alpha_i + \beta_1 \text{COB Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Expense Ratios}_{i,t-1} + \epsilon_i \] (7)

\[ \text{Mngr. Comp}_i = \alpha_i + \beta_1 \text{Mngr. Comp}_{i,t-1} + \beta_2 \text{Fund Characteristics}_{i,t-1} + \beta_3 \text{Expense Ratios}_{i,t-1} + \epsilon_i \] (8)

\[ \text{Performance}_i = \alpha_i + \beta_1 \text{Comp}_{i,t} + \beta_2 \text{Expenses}_{i,t} + \beta_3 \text{FundCharact}_{i,t} + \beta_4 \text{CorpGovern}_{i,t} + \epsilon_i \] (9)

Meta-papers, not common in the financial literature, are designed to perform a statistical analysis of prior papers, trying to identify common traits and contrast findings. Given the abundant research in mutual fund performance, Prather et al. (2004) present their search for the determinants of fund performance as a meta-analysis. Similarly, Flannery and Hankins (2012) masterfully analyze the methodologies, available in the field of corporate finance, dealing with dynamic panel models. Flannery and Hankins’ (2012) article is not only a thorough anthology of econometric techniques, but also performs an exhaustive number of simulation analyses, to test them. The kind of panel data that is often at the heart of the corporate finance literature carries its own set of trademarks. Corporate finance panel data models usually include at least one of the following characteristics: large number of regressors,
endogeneity problems, serial correlation, short panel biases, unbalanced panels, missing observations, and censored or clustered dependent variables. My analysis may account for: large number of regressors, missing observations, and clustered dependent variables. Developments in econometric techniques have been devised to outwit these problems; however, for the most part, even the advanced econometric models have been only tested in small panels, with only one or two regressors, taken from a pool of independent and normally distributed samples. The authors test seven econometric methods, used in corporate finance dynamic panels, on datasets altered with at least one of the possible irregularities that threats corporate finance data. To construct their Monte Carlo simulation the authors use a jointly normal distribution with a variance-covariance matrix that is derived from the most common Compustat variables. The variance-covariance matrix allows for correlation among variables and wide differences in their volatilities, i.e. heterogeneity. Furthermore, among the seven methodologies used, the authors include OLS and FE as baseline models. OLS estimation is unaffected by short panels, but provides biased and inconsistent estimators because it assumes all the observations are independent. Fixed effects estimation main flaws manifest in shorter and unbalanced panels; its accuracy is also jeopardized when the lagged dependent variable needs to be estimated among other regressors, due to autoregressive processes. There are two methods that emerge as the dominant models in Flannery and Hankins’ analysis: the Blundell and Bond’s (1998) GMM model and the Least Square Dummy Variable Correction, LSDVC, method. First, Blundell and Bond’s (1998) GMM consists of a system of two equations, a regression on the levels, and a regression on the differences to neutralize induced endogeneity concerns. Alternatively, the second method is the LSDVC model introduced by Bruno (2005); the LSDVC methodology corrects for FE biases, including biases on a categorical variable extracted from a shorter panel. Compared by their Root Mean Square Errors, RMSEs, the LSDVC method usually provides more accurate estimators. The Blundell and Bond (1998) GMM performs quite well, is either the best or second-best methodology, with the first place being taken by the LSDVC model. However, the LSDVC method requires exogenous regressors and independent errors, it is quite costly in terms of degrees of freedom, and involves a lot of computer power. When presented with unbalanced panels or high
endogeneity, the GMM outperforms the LSDVC methodology. Blundell and Bond’s (1998) methodology does well estimating processes that are slightly autoregressive; executive compensation tends to build on prior periods’ salaries. The CEO compensation literature captures the difficulty of salary reductions, which are not as prevalent as increases, with similar attributes in the mutual fund industry. Furthermore, censored dependent variable, missing observations, or even relatively sluggish variables, do not temper the performance of the Blundell and Bond’s (1998) GMM methodology. Hayakawa (2007) focuses on the performance of the Blundell and Bond’s (1998) GMM, also known as system GMM estimation, with dynamic panels characterized by small samples. The author is initially concerned with the use of Blundell and Bond’s (1998) GMM in panel data for small samples since it uses more instruments than alternative GMM methodologies, such as first differencing (Arellano and Bond, 1991), or level estimation (Arellano and Bover, 1995). The author fears that using more instruments might cause even more severe biases in small samples so he decides to compare the three GMM methodologies using Monte Carlo simulation. He finds that the bias in the Blundell and Bond’s (1998) GMM estimator has two components; the first element of the bias is the weighted sum of the biases of the first differencing and level estimators, the second element is the result of using the first difference and the level estimator jointly. Hayakawa’s (2007) findings reveal that both biases are actually of opposite sign and similar magnitude hence, they tend to cancel each other in the Blundell and Bond’s (1998) GMM estimator. Therefore, according to his simulation the system GMM estimator performs well with small samples (Hayakawa, 2007). Hence, the GMM presented by Blundell and Bond (1998) appears to be a good fit to test the hypotheses within this dissertation, specially the third and fourth ones, which are the most likely to include lagged values of the dependent variables as regressors, because current salary is not completely independent of the salary from the previous period.

\[
\text{Dir. Comp}_it = \alpha_i + \beta_1\text{Dir. Comp}_{it-1} + \beta_2\text{Fund Characteristics}_{it-1} + \beta_3\text{Corporate Governance}_{it-1} + e_{it} \quad (3)
\]

\[
\text{COB Comp}_it = \alpha_i + \beta_1\text{COB Comp}_{it-1} + \beta_2\text{Fund Characteristics}_{it-1} + \beta_3\text{Corporate Governance}_{it-1} + e_{it} \quad (4)
\]

\[
\text{Mngr. Comp}_it = \alpha_i + \beta_1\text{Mngr. Comp}_{it-1} + \beta_2\text{Fund Characteristics}_{it-1} + \beta_3\text{Corporate Governance}_{it-1} + e_{it} \quad (5)
\]
In corporate finance any estimation that attempts to tackle stock returns tend to be complex and controversial. Performance measurements for mutual funds have similarities with stock or bonds indices returns. Hence, when testing my fifth hypothesis, which encapsulates mutual fund performance around corporate governance, expenses, and fund characteristics, regardless the methodology employed, the variables tend to be only marginally significant in statistical and economical terms, and the overall explanatory power of the model nearly non-existent. In the literature review section, I report Prather’s et al. (2004) attempt to pinpoint the determinants of mutual fund performance. The authors’ approach to the task is not innovative in its methodology. Performance is regressed against a comprehensive list of fund-specific characteristics in a generalized multifactor model controlling for investment objective and period-specific variability through fixed effects. Estimating performance requires a more ambitious method; one possibility is to employ Harvey’s (1976) heteroscedastic regression, also implemented by Iannotta and Navone (2012), to explain the dispersion of fees across classes of mutual fund shares. Heteroscedasticity is the phenomenon in which the variability of a variable is unequal across the range of values of a second variable used to predict it (Wooldridge, 2009). There appears to be consensus around the idea of heterogeneity in the mutual fund industry. Explicitly, Iannotta and Navone (2012) state that the mutual fund industry is severely heterogeneous; most articles from this literature review uses investment objective as a regressor in their models. Prather et al. (2004) emphasizes that many of the anomalies find in the previous literature dealing with mutual fund performance are the consequence of using improper benchmarks to account for funds’ heterogeneity. Nevertheless, they still find that funds investing in small capitalization firms have more variability of returns and outperform the rest (Prather, Bertin, & Henker,
Thus, it seems more realistic that if one allows the average performance to possibly increase with certain investment objectives, for instance, equity versus fixed income, the variability of performance could also increase. Harvey’s (1976) heteroscedastic regression model includes a system of three equations that account for the mean and variance of the variable of interest. Harvey (1976) demonstrates that the estimation of the heteroscedastic regression using maximum likelihood estimators is superior to a two-step procedure. The variance expression assumes that the variability is proportional to one of the regressors; Harvey also provides an alternative to estimate the variance function when this proportionality is unknown (Harvey, 1976). The model consists of three equations: the variable of interest, in this case performance, conditional on the predicted mean and variance values, a linear expression for the mean, and a log-linear equation for the variance. The residuals in the equation deriving the variable of interest are assumed to be independent, and normally distributed. Prather et al. adapt Harvey’s (1976) methodology clustering by fund, given the panel dataset nature of their sample. When deciding to cluster errors by fund one can think of Carhart’s (1997) seminal paper famous finding of persistence in mutual fund performance is one of the most results in the mutual fund literature. Elton’s et al. (2003) empirical findings support persistence in prior positive and negative performance. However, their study focuses only on funds that use incentive fees; these funds although growing are a small sample of the total population of funds. On the contrary, Prather et al. (2004), using a more robust benchmark, find mean reversion on mutual fund performance instead of persistence. Following the works of Harvey (1976), Prather et al. (2004) and Iannotta and Navone (2012) although the heteroscedastic model works measuring mutual fund fee dispersion, I first apply this method to my fifth hypothesis, which relates to mutual fund performance. The results are included in the panel data results section.

\[ \text{Performance}_{it} = \mu_{it} + \sigma_{it} \epsilon_{it} \quad (12) \]

\[ \mu_{it} = \mathbb{E}(\text{Performance}_{it}) = \beta_0 + \beta_1 \text{Comp}_{it} + \beta_2 \text{Fees}_{it} + \beta_3 \text{FundCharact}_{it} + \beta_4 \text{CorpGovern}_{it} \quad (13) \]

\[ \log(\sigma_{it}) = \log(\text{Var(Performance}_{it})) = \gamma_0 + \gamma_1 \text{Comp}_{it} + \gamma_2 \text{Fees}_{it} + \gamma_3 \text{FundCharact}_{it} + \gamma_4 \text{CorpGovern}_{it} \quad (14) \]
VI. Results

VI. A. Cross-sectional data

The following section describes the results of the multivariate analyses developed to test the five hypotheses in this study. The first two hypotheses aim to clarify the relationship between brokerage commissions and alternatively corporate governance characteristics or mutual funds’ expenses. This first approach to both hypotheses is conducted in a cross-sectional sample of individual mutual fund observations for the most recent fiscal year, 2015. Each hypothesis is tested using four different models. The four regression models include a standard OLS regression, a robust regression designed to minimize the impact of outliers and high leverage observations as introduced by Huber (1973), a heteroscedastic-consistent regression, and finally, a regression in which the standard error terms are clustered according to mutual fund family membership. These four regression analyses have two additional iterations, first the models are run using the entire sample, and additionally all models are applied to two sub-samples: first excluding index funds and then focusing only on mutual funds that charge 12b-1 fees. Throughout all the four different models and all the three sample iterations, the 12 models are kept consistently the same. Following the prior financial literature dedicated to the study of mutual fund fees, if a dependent variable or regressor is log-transformed, prior to entering in the model, the same log-transformation is kept throughout the four regression analyses and the three sample iterations.
VI. A. i. Cross-sectional Hypothesis I

Hypothesis I:

In testing my first hypothesis that posits that funds with stronger corporate governance structures in place should carry smaller brokerage fees, controlling for other possible characteristics that the financial literature has suggested influence brokerage fees, I run four regression models on three alternative samples.

\[ \text{Brokerage Fees}_{it} = \alpha_i + \beta_1 \text{Fund Characteristics}_{it} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Fund Turnover}_{it} + e_{it} \quad (1) \]

Board of Directors (BOD) governance characteristics, including independent directors’ and chairmen’s traits, and mutual fund characteristics are run as regressors of brokerage fees using four regression models, though three different samples for a grand total of twelve regressions. Twelve corporate governance characteristics are included as variables of interest in this model: number of directors, number of independent directors, number of female directors, directors’ fund ownership, number of committees, committee meetings, Chairman of the Board (COB) age, COB tenure, number of funds overseen by the COB, COB fund ownership, dual CEO/COB status, and number of other officers. All the models employ the same variables of interest and also include the same mutual fund characteristics as control variables to account for mutual funds’ traits. The mutual fund characteristics included as control variables have been deemed pertinent in explaining the variation is mutual funds’ expense ratios in the prior financial literature. Statistically significant regressors are discussed below with comparisons made across regression models and sample variations.

[Insert Table VI here]

Table VI summarizes the regressions results for the relationship between brokerage commissions and board of directors characteristics, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis one and modeled by equation (1), across four different methodologies.
The regression models are very consistent with an F=28.63 (p< 0.001). The Chi-Square for the White regression model is significant ($\chi^2=240.95$, p<0.10) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain more than half of the variation in brokerage commissions for 2015, with an adjusted $R^2=0.52$ for the full sample. Eleven of the 12 board variables of interest have a statistically significant role in the regression model. The list of the eleven corporate governance regressors in the order of their contribution to explain variation on brokerage commissions are: number of independent directors, number of female directors, dual CEO/COB, number of directors, directors fund ownership, number of committees, committee meetings, COB tenure, COB age, number of funds overseen by COB, and number of other officers. The intercept is not statistically meaningful, however, seven control variables are significant, in order of their contribution to the variability of the brokerage commissions: investment objective, turnover ratio, TNA, institutional flag, index flag, family category, and fund life. All control variables regardless of their significance levels exhibit the sign and magnitude that is expected judging by the results gathered in my literature review. Even return, which is not statistically significant presents a negative coefficient indicating a negative relationship between brokerage commissions, a net expense, and portfolio return. Each control variable is individually discussed below. This overall consistency of the control variables reinforces the validity and representativeness of the sample.

[Insert Table VII here]

Table VII summarizes the regressions results for the relationship between brokerage commissions and corporate governance characteristics in the first cross-sectional sub-sample, which excludes index mutual funds, for the year 2015, as discussed in hypothesis one, and modeled in equation (1), across four different methodologies. In this sub-sample, omitting index mutual funds, the overall model is still significant but presents a lower F ratio (F=20.28, p<0.001). The Chi-Square for the White regression
model is not significant disregarding the presence of heteroscedasticity. However, there are not significant differences in the F, R², or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The percentage of the variance of brokerage fees explained by the linear combination of the corporate governance factors is also lower (adjusted R²=0.47) but still remains pivotal. Besides, this muted effect is likely due to the smaller sample size. Largely, the same independent variables are statistically significant in both samples but with muted p-values in the smaller sample that excludes index mutual funds. Eleven out of the initial 12 corporate governance regressors remain significant, and the order of their contribution to explain variation on brokerage commissions remains the same. The intercept is still statistically not significant, however, the assembly of control variables that emerge as statistically significant, once index funds and the index-fund categorical variable are excluded, has changed. There is now an additional statically significant control variable for a total of six relevant control variables, in order of their contribution to explain the variability of brokerage commissions; these are: return, investment objective, turnover ratio, TNA, family category, and fund life. Return, which is not relevant for the entire sample has now became the strongest determinant of brokerage commissions, and institutional flag, which is only marginally relevant in the entire sample has been relegated to being undistinguishable from zero in these models.

[Insert Table VIII here]

Table VIII summarizes the regressions results for the relationship between brokerage commissions and other corporate governance characteristics in the second cross-sectional sub-sample which, excludes mutual funds that do not charge 12b-1 fees, for the year 2015, as discussed in my first hypothesis, and modeled in equation (1), across four different methodologies. In this sub-sample, with mutual funds that charge 12b-1 fees, the overall model is significant, and has a higher F ratio (F=29.21, p<0.001) than the first sub-sample (excluding index funds), but still presents a lower F ratio than the full sample. The Chi-Square for the White regression model is significant (χ²=229.73, p<0.05) indicating heteroscedasticity is present. However, there are not significant differences in the F, R², or the regression
standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The percentage of the variance of brokerage fees explained by the linear combination of the corporate governance variables of interest is higher (adjusted $R^2=0.64$). Several controls and variables of interest lose their statistical significance across all four regression-models for this sample. Now, six out of the initial 12 corporate governance regressors remain significant and their order of contribution also changes slightly, in the new order they are: number of independent directors, number of directors, number of other officers, directors fund ownership, COB age, number of funds overseen by COB. In this analysis, the intercept and six somewhat different control variables are also significant; in order of their contribution to explaining brokerage commissions the control regressors are: investment objective, turnover ratio, TNA, index flag, number of other officers, and fund life.

As mentioned in the variable section, within the investment objective categories reported by CRSP there are three objective codes: domestic equity, international equity, and bonds. Two of them apply to this study since I purged the sample of funds that pursue mainly foreign investment. Hence, for this study, a categorical variable is constructed to reflect the funds’ investment objectives. Since the most numerous investment objective in my sample is domestic equity, I use it as the default value for the model. Across all 12 regressions, i.e. four models applied to the entire cross-sectional dataset and two sub-samples, investment objective is statistically significant at the highest confidence level and the control group, domestic equity, has a negative coefficient in relationship to brokerage commissions ($p<0.001$). In the full sample and the sub-sample that excludes index mutual funds, tables VI and VII, for the standard OLS and White regressions, the investment objective variable has approximately the same coefficient ($\beta=-1.9$), although it carries a slightly smaller beta in the regressions where the errors are clustered according to family membership ($\beta=-1.7$ to $\beta=-1.8$). Nevertheless, the variable has a larger magnitude, in absolute value, for the sub-sample that excludes mutual funds that avoid charging 12b-1 fees ($\beta=-2.6$) across all four regressions. This negative coefficient on investment objective indicates that, on average, the brokerage commissions paid by domestic equity funds are comparatively higher than the
commissions paid by their fixed income counterparts, after controlling for other mutual funds characteristics that might affect brokerage commissions such as turnover ratio and family membership. It seems intuitively logical to assume that domestic equity funds pay lower brokerage commissions than their fixed income counterparts, given the fact that most of the trading in fixed income securities is very fragmented given the enormous number of different bond issues available. I could not find any formal account of the differences in costs for trading bonds or equity. A 2009 Forbes’ article categorizes bond commissions as the ‘investors’ worst enemy’. Bonds’ trading is often more complex and less transparent than equity trading. This allows brokers to cash larger profits than they can secure from equity trading (Anderson, 2009). I found several practitioner editorialized articles that echo the obscurity of bond brokerage commissions and pricing, citing anecdotal evidence, they estimate the average bond trade costing between one and five percent of the total price and even reaching 20 percent for smaller municipal issues (Nikulicz and Neibart, 2011; Johnston, 2011). Throughout this analysis, including all four different regression models and the three sample iterations, investment objective remains negative and statistically significant. These results suggest that equity funds tend to charge, on average, higher brokerage commissions than other mutual funds with different investment objectives, after controlling for relevant mutual fund characteristics. This makes me believe that the consequence of higher equity trading expenses might be not purely on the transaction cost but also in the type of brokers that equity mutual funds use. If they are relying more heavily in service brokers to gain soft dollar compensation in return, then the results might make stock trading more expensive than fixed income trading for mutual fund customers.

The total net assets variable (TNA) enters into the regression as a log-transformed variable to reflect mutual fund size. Controlling for mutual fund size facilitates distilling from the regression elements of fund complexity that might be influencing variability in brokerage commissions and helps me capture a more unadulterated corporate governance effect on brokerage fees. In tables VI, VII, and VIII, throughout all four models (OLS, robust, White, and clustered regression), and across all three samples
(full, excluding index funds, and funds charging 12b-1 fees), i.e., in twelve different regressions, the effect of TNA is statistically significant at the highest confidence level (p<0.001) and it is negatively related with brokerage fees. A change of one percent in TNA accounts for a decrease in brokerage fees that of approximately half of a percent. It is remarkable that the coefficients across all 12 singular regressions are so close in value (β=−0.46 to β=−0.54). This negative relationship between mutual funds’ size and expenses has been portrayed before in the financial literature. Multiple authors suggest economies of scale, usually approximated by higher TNA, as a possible cause for a reduction in mutual fund expenses, sharing my results (Malhotra and MacLeod, 1997; Tufano and Sevick, 1997; Adams et al., 2012; Iannotta and Navone, 2012; Malkiel, 2013). In most cases, the existence of economies of scale as a fee reduction force is empirically confirmed. Therefore there is consensus surrounding the scalability of most mutual funds expenses. In the periphery of this discovery, one could hypothesize that large mutual funds may have market power to negotiate brokerage commissions and that part of these savings, obtained by executing their market power, are transferred to the mutual fund customers.

The number of other officers or executives that are employed by the mutual fund approximates for fund size while evaluating how efficiently the fund is being managed. There are two ways in which corporations can be more profitable by increasing revenues or by reducing expenses, having a lower personnel footprint fits the latter. My intent with this variable is to examine whether a fund delivers better results when it keeps the number of high-rank employees relatively low. In the full sample (Table VI) and in the sample excluding index funds (Table VII), there is a statistically significant negative relationship between the number of officers serving at the fund and brokerage commissions (p<0.001 to p<0.01); however, this relationship is very slight. Interestingly, in the sample of mutual funds that charge 12b-1 fees (Table VIII), the magnitude of the relationship is somewhat larger but also positive, with an increase in the number of officers engaging an increase in brokerage fees at a high significance level across all regressions including the clustered model (p<0.001). Hence, in the entire population and in the segment of funds that include only actively managed funds (Tables VI and VII), each additional officer
decreases brokerage commissions by a modest amount ($\beta=-0.02$, $p<0.001$ to $p<0.10$). As usual, the effects are smaller in the clustered models. Conversely, when all the funds considered charge 12b-1 fees, table VIII, each additional officer costs mutual fund customers higher brokerage commissions ($\beta=0.08$), and this effect resonates at a high confidence level across all four statistical methodologies ($p<0.01$).

**Family** membership is a categorical control variable and therefore enters the regression models as a dummy variable. In tables VI and VII, which pertain to the entire sample and to the pool of funds that are not passively managed index funds, for all regressions (OLS, robust, and White) where the family affiliation is included, the coefficient measuring the relationship between family membership and brokerage commissions is significant and signals a negative relationship. Customers from the mutual funds belonging to the family control group encounter, on average, higher brokerage fees ($\beta = -0.03$ to $\beta = -0.04$) with a high statistical significance level ($p<0.01$). In table VIII, focused on the pool of mutual funds that charge 12b-1 fees, family membership has no statistically significant connection to brokerage fees. Across all three samples (Tables VI through VIII), the family of investments variable drops out of the clustered regression since the observations are clustered in over 35 family groups.

If the analysis of mutual funds’ **return** focuses on the sample of actively managed mutual funds (Table VII), i.e., those funds that are not passively mimicking an index, the results across all four regressions indicate that mutual funds’ returns are statistically significant. Returns carve a vehemently negative relationship with brokerage commissions ($p<0.001$ to $p<0.01$). On the contrary, mutual funds’ returns are not a statistically significant factor explaining the variability of brokerage commissions as reckoned by the standard OLS analysis, robust model, heteroscedasticity-consistent regression, and the fund family-clustered estimation for the full sample (Table VI) and the sample of mutual funds charging 12b-1 fees (Table VIII). These non-statistically relevant coefficients obtained through the eight combined regressions from both cross-sectional pools however, are very close in magnitude and also identify an inverse relationship between mutual fund performance and brokerage expenses. For the sample excluding index mutual funds, across all four regressions, an increase of one percent in returns is accompanied by a
reduction in brokerage commissions of approximately 2.3 percent; the magnitude of the impact measured by the mutual fund family-clustered regression model is slightly smaller ($\beta = -2.2$). Two interesting elements converge in the relationship between performance and brokerage fees. First, the relationship is only significant once index funds have been excluded from the sample and second, it is noteworthy that the association between return and brokerage commissions is negative. Both aspects solidify the idea that professional managers tend to overwhelmingly underperform index mutual funds and that frequent trading from portfolio managers constitutes just a net expense to the average investor. Malkiel (2013) and Norton (2016) echo this situation before, the odds of professional managers outperforming the market in a given year is less than half, and is almost null for two consecutive years. Mutual fund fees are part of the explanation; if markets are efficient, frequent trading does not ensure superior performance but it guarantees higher expenses in the form of brokerage commissions and transaction costs, which erode returns even more.

Further down the list of control variables that identify mutual fund features, **fund life** has a positive connection with brokerage fees across all 12 regressions, with varying confidence levels ($p<0.01$ to $p<0.10$). The coefficient for fund life remains fairly close ($\beta = 0.02$ to $\beta = 0.03$) across all regressions for the entire sample (Table VI) and the pool of observations that excludes index mutual funds (Table VII). The statistical significance levels vary, reaching the zenith in all regressions for the entire sample, in the OLS and White regression in the actively traded funds sub-sample, and the OLS, robust, and heteroscedasticity-consistent regression models in the sample of funds with 12b-1 fees ($p<0.01$); otherwise remaining statistically significant at the five percent level for the other analyses within these two sub-samples, except for the last clustered regression model ($p<0.10$). In general, as the fund ages by another year, brokerage fees increase marginally. Hence, established mutual funds tend to charge higher transaction costs than their younger peers. This situation could be a consequence of funds deciding what brokerage firms to choose to execute their transactions based on the principle of ‘solidifying a long-term fund-broker relationship’ without cost concerns. Therefore, the empirical evidence indicates that the
consequence of pursuing long-term fund-broker relationships instead of tracking the most competitive bid, results in higher transaction costs for mutual fund customers. The empirical evidence gathered from the financial literature is divided in this matter. Even though brokerage commissions have not been approached before in this fashion, expense ratios have been juxtaposed with fund life before. Both, Tufano and Sevick’s (1997) and Iannotta and Navone’s (2012) research works confirm my results. The authors find that older funds and the worst underperformers tend to charge higher fees. Alongside, manager tenure, which predictably has a moderate positive correlation of 0.4 with fund life, has a coefficient of almost exactly the same magnitude as fund life (Please refer to Table III, which summarizes the correlation matrix for the cross-sectional dataset).

Evidently, turnover ratio has a positive association with brokerage fees for all three samples and across all four models at the highest confidence level (p<0.001). A direct and significant relationship between turnover rate and brokerage commissions might be considered the sine qua non condition of the validity of this regression analyses. Turnover rate measures the percentage of a fund's portfolio that has changed over the past year. Consequently, higher portfolio rotation translates to higher brokerage commissions. The fact that turnover ratio is statistically significant at the highest level and exhibits a positive coefficient of substantial magnitude, throughout all the models, and all the samples iterations (12 regressions), is a testimony to the validity of the manually collected cross-sectional sample of brokerage commissions. Across the complete sample of mutual funds (Table VI), the smaller population of actively managed funds (Table VII), and the even smaller sample of funds that charge 12b-1 fees to their customers (Table VIII), the increase in brokerage commissions associated with turnover ratio is approximate of the same magnitude and displays the highest significance levels (p<0.001). In general, an increase in turnover ratio of one percent triggers, on average, an increase of brokerage commissions of approximate half of a percent ($\beta =0.51$ to $\beta =0.6$). As a reflection of how interconnected turnover ratio is with brokerage commissions, the financial literature in many instances uses turnover rate to approximate brokerage commissions.
The categorical variable that identifies if a mutual fund is passively managed or designed to replicate a stock index (Index Flag) appears to be statistically significant and points towards a negative relationship with brokerage commissions varying slightly from the full sample (Table VI) to the sample that charges 12b-1 fees (Table VIII). This dichotomous variable takes a value of one when an index mutual fund is identified, and it is zero otherwise. It drops from the regression in the sample that excludes index mutual funds since all of the observations are index funds (Table VII). Despite being a smaller sample, the index fund categorical variable reaches a higher level of statistical significance in the subdivision of mutual funds that charge 12b-1 fees (p<0.001 to p<0.01); being passively managed is slightly less impactful for the entire sample (p<0.001). Albeit the slight difference on statistical significance levels between both cross-sectional datasets, the magnitude and direction of the betas is very similar across the two samples. For the total population in table VI, mutual funds identified as index funds charge less in average brokerage commissions ($\beta = -0.37$ to $\beta = -0.3$). Analogously, focusing on the population of funds that collect 12b-1 fees causes not only the statistical significance to increase, but also raises the impact of pursuing a passively managed strategy slightly ($\beta = -0.38$ to $\beta = -0.34$). Evidently, index funds trade much less than actively managed funds; according to these tables, when they do, their trades are more cost efficient. A possible explanation for this situation would be the fact that soft dollar compensation does not have a place in the internal trading done by index mutual funds managers. The purpose of directing trade through service brokers, which provide soft dollar compensation, is to obtain the research services that accompany the premium brokerage transaction. Since index funds are just trying to replicate an index, no additional research is required. Most trades in index funds should be conducted through capital brokers not service brokers, which charge non-competitive prices for trading in exchange for soft dollar compensation. This intrinsic characteristic of index funds explains the negative association and sheds light on soft dollar compensation. Furthermore, one can draw a parallelism between index mutual funds and institutional mutual funds in regards to their predisposition to charge lower fees than their retail or actively managed counterparts. The institutional dichotomous variable, included in the model, is designed to identify mutual funds from the sample that are exclusively targeting
institutional investors, i.e., large financial institutions. As explained by Adams et al. (2012), mutual funds offered to institutional investors charge lower fees because the mutual fund market for this type of investors is more competitive. Institutional investors are more knowledgeable, and usually more involved as shareholders, both traits may have a positive effect on corporate governance, aligning incentives between mutual fund managers and customers. However, in my analysis, the institutional fund identifier has not a statistically significant connection with brokerage commissions in any regression. The lack of statistical significance across the other regressions is probably the consequence of the small number of institutional funds included in the population; only approximately nine percent of all the funds included in the total population are identified as institutional funds.

The results on the variables of interest are quite notable, eleven of the twelve corporate governance characteristics, including: number of independent directors, number of female directors, dual CEO/COB, number of directors, directors fund ownership, number of committees, committee meetings, COB tenure, COB age, number of funds overseen by COB, and number of other officers, are almost unequivocally statistically significant in the full sample (Table VI) and both sub-samples of mutual funds (Tables VII and VIII) across all four regression models (12 regressions total). Furthermore, in the full sample, these regressors are statistically significant at the highest levels (p<0.001 and p<0.01). As the number of observations decreases from one cross-sectional population into the next, the strength of the statistical significance also decreases. For the largest sub-sample, which excludes index mutual funds (Table VII), the same 11 corporate governance characteristics remain relevant but their statistical importance varies by regressor. Moreover, in the smallest fund population among all three, designed to identify mutual funds that charge 12b-1 fees to investors (Table VIII), now six of the corporate governance regressors are significantly associated with brokerage commissions; the short list according to the magnitude of impact on brokerage commissions includes: number of independent directors, number of directors, number of other officers, directors fund ownership, COB age, and number of funds overseen by the COB.
There is no consensus on the ideal board size. Setting the **number of directors** is affected by the tradeoff between efficacy and supervision. Too many directors may increase board expenses unnecessarily and could potentially lack a unified vision. Contrariwise, a board without enough members may fall short ensuring proper supervision of management, particularly, when directors are busy, populate small boards, or experience an astronomical increase in the number of funds supervised, as seen on table IV. For this analysis, the number of directors has a statistically significant relationship with brokerage fees, across eight of all 12 regressions (p<0.01 to p<0.001). In the full sample (Table VI) and the sub-sample omitting index funds (Table VII), for each additional director, there is a half of a percent increase in brokerage commissions. The impact of this board characteristic decreases in parallel with the number of observations in the sub-sample, when the analysis concentrates on mutual funds charging 12b-1 fees (Table VIII); now brokerage commissions grow much less for each additional director in this smaller pool of mutual funds (β=-0.2; p<0.01). How the number of directors on the board affects other areas of the firm is a topic that has sparked the interest of researchers before; Ferris and Yan (2007) also test the effect of board size on expense ratios. Ferris and Yan (2007) employ a cross-sectional sample of approximately 530 mutual funds for one single year, 2003, to primarily identify how board design and director compensation influence mutual funds’ corporate governance. The authors’ empirical results offer moderate support for a positive relationship between the number of directors in a mutual fund board and its level of expense ratio (Ferris & Yan, 2007).

For this analysis, the **number of independent directors** shows a statistically significant inverse relationship with brokerage commissions across all 12 regressions, at varying confidence levels (p<0.001 to p<0.05). Across three of the four models tested for the entire sample of mutual funds (Table VI), as the number of independent directors increases brokerage commissions decrease, on average, between 3.25 and 3.7 percent (p<0.001). This relationship is slightly muted for the methodology that clusters errors according to family membership (β=-2.55, p<0.001). The impact of independent directors on brokerage commissions is even more pronounced across all four regression-models once index funds are eliminated.
from the sample despite the fact that the population size is smaller (Table VII). In three of the four statistical models, an additional independent director is associated with a decrease in brokerage commissions of approximately 6.5 percent (p<0.001 to p<0.01). The regression that clusters errors by family provides a smaller six percent decrease in brokerage fees per additional independent director (p<0.01). The sample absorbed by mutual funds with 12b-1 fees carries the least number of observations among the three population iterations and also carries a smaller bond between board independence and brokerage fees. The increase in board independence caused by an additional non-interested director would reduce brokerage commissions, on average, by almost two percent in the OLS and White regression models (p<0.01). However, its effect is somewhat smaller according to the robust and clustered models, quantifying a 1.5 percent decrease in brokerage commissions (p<0.01 to p<0.05).

Ferris and Yan (2007) fail to find evidence linking board independence and expense ratios (Ferris & Yan, 2007). However, this study focuses particularly on brokerage commissions, and its sample size is considerable smaller, which could explain the departure from my findings.

In the midst of board structure, the next explanatory variable examines the connection between board gender diversity and brokerage fees. This nexus is examined by measuring the impact of having additional women on the board of directors. According to my statistical analyses, the number of female directors is inversely related to brokerage fees and statistically significant in six regressions: OLS, robust, and White, for both: the entire sample and the sub-sample of funds that are actively managed (p<0.01 to p<0.10). For the whole sample in table VI, the output coefficients indicate that having one additional female director serving on the board are linked to a decrease in average brokerage commissions of 2.2 to 2.5 percent (p<0.01). This outcome is more moderate in the dataset that omits index funds (Table VII), where additional women on the board reduce average brokerage fees by 1.7 to 2 percent (p<0.05 to p<0.10). Perhaps, the relatively small number of boards that have female representation is responsible for the disappearance of the statistically significant effect of this variable on brokerage commissions for the smallest cross-sectional population, the sample that ignores funds not charging 12b-1 fees (Table VIII).
The role of women in boards has not raised too much interest in the corporate governance literature in general much less on the mutual fund financial literature.

The categorical variable that identifies if an independent director is invested in the mutual fund he serves; directors fund ownership is statistically significant and suggests a direct relationship with brokerage commissions, across all twelve regressions, varying slightly from sample to sample. As revealed in the data section, director fund ownership is reported in intervals. The categorical variable takes five values to identify different levels of investment in the mutual fund in hand: from zero, which indicates no investment, to five, which corresponds to more than $100,000 of personal assets deposited in the fund. The strongest impact of this relationship, across all four statistical linear regression methodologies implemented, appears in the pool of mutual funds that charge 12b-1 fees (Table VIII) and in the full sample (Table VI). The statistical strength fades slightly in the sub-set of actively managed mutual funds (p<0.05), but improves for the clustered model within this sub-sample (p<0.01) (Table VII). The magnitude of the positive relationship between fund ownership and brokerage commissions is most pronounced in table VIII, which contains the results from the sub-sample with only funds charging 12b-1 fees (β=0.06, p<0.001 to p<0.01). Next, in caliber, the results for the full sample (Table VII) show an increase in brokerage fees (β=0.05, p<0.001 to p<0.01), which can be traced to an increase in director ownership of the supervised mutual fund. Finally, a vested interest in the mutual fund where the director provides his services reveals an increase in brokerage commissions (β=0.04, p<0.001 to p<0.01), for the sample that disregards passively managed mutual funds (Table VII). Simultaneously, the same type of categorical variable is built to trace Chairman of the Board (COB) investment in the mutual funds. The coefficients, although of largely similar magnitude, appear statistically irrelevant but mostly suggest the same direct relationship with brokerage commissions. Hence, it seems that independent directors’ but not COB’s personal investments in the mutual funds they are managing is statistically significant and positively related to brokerage fees. Given the fact that the number of directors that holds ownership on the mutual funds they supervise is relatively small, the results suggest that directors tend to seek and
prefer funds that are more actively managed when they make decisions in regards to where to allocate their money. It is unlikely that this may indicate a lack of understanding surrounding the expenses involved with actively traded funds; since directors are very strategic about where they place their own money. Ferris and Yan (2007) consider the effect of mutual fund ownership from both insider and independent directors on expense ratios to no avail. Alternatively, another article from a year later shows results that moderately align with mine; Kong and Tang (2008) look at the effect of corporate governance in mutual funds, focusing on funds with unitary boards, which are widely spread across the industry. They manually collect information and analyze almost 970 large domestic mutual funds from 126 different fund families for the year 2003. The authors identify two groups within their sample: families with highly incentivized directors and other families. Parent companies with highly incentivized directors are characterized as families where directors invest more than $100,000 in the entire mutual fund family or where directors’ annual salary exceeds $100,000. Their findings reveal that there is a positive relationship between highly incentivized directors and components of mutual fund expenses, separated in: expense ratios, management fees, and 12b-1 fees. However, the magnitude of this positive relationship is even stronger for other families, where directors have less than $100,000 invested in the family of funds or with annual independent director pay below $100,000 (Kong & Tang, 2008). The authors approach to directors’ level of investment in the funds and their salary to determine their involvement is not anomalous. Morningstar looks into ‘board quality’ as one of the five criteria for their star rating. One of the measures used to assess board quality tries to identify whether mutual fund board’s incentives are aligned with shareholder’s success; to make this determination, Morningstar uses an algorithm that rewards funds with directors that have more invested in the fund than the annual compensation they receive to serve its board (Morningstar Fund Research Group, 2011).

The ICI’s (2015) Overview of Fund Governance Practices, 1994–2014 reveals that 97 percent of mutual funds have at least one committee. When mutual funds only have one committee the audit committee prevails. The function of any committee is to focus board attention on a relevant subject that
requires additional time or resources (audit, governance, compensation, etc.) (Investment Company Institute, 2015). This increase in committees is parallel to the increase in the time directors need to allocate to their job. Fiduciary responsibility is also demanding more accountability from boards, amplifying the level of risk that directors are exposed to, while requiring higher professional standards. One of the ways in which these higher expectations manifest is in the form of committee meetings. Table IV, the descriptive statistics for panel data, uncovers an outburst on the number of committee meetings over the last couple of decades. A positive relationship between the number of committee meetings and brokerage commissions emerges from this analysis across all 12 regressions, even for the last four statistical analyses, when the coefficients are no longer significant. Table VI includes all cross-sectional observations; in this setting, an additional committee meeting significantly links to an increase in the brokerage commissions, across all of the regression models ($\beta=0.02$ to $\beta=0.04$, $p<0.001$ to $p<0.01$). The impact of the relationship between the number of committee meetings and brokerage commissions diminishes for the population excluding passively managed index-funds (Table VII), while maintaining an increase in brokerage commissions with every additional committee-meeting ($\beta=0.01$ to $\beta=0.03$, $p<0.001$ to $p<0.05$). The relationship is not statistically significant for the sample of mutual funds charging 12b-1 fees (Table VII); however, the coefficients maintain the same direction than their forerunners. The ICI in its Overview of Fund Governance Practices, 1994–2014, reports that between 1998 and 2014, the average number of committee meetings, in which independent directors participated, doubled. Interestingly, during the same period the majority of the mutual funds studied stop paying fees for attendance at board or committee meetings (Investment Company Institute, 2015). Nili (2015) looks into mutual funds’ boards from the perspective of corporate governance and law compliance. Albeit the author believes committee-meeting fees have boosted attendance in the past; he reports that mutual funds are required to report in the funds’ statement of additional information whether their directors attend at least 75 percent of meetings, and that nowadays, attendance no longer an issue because of the new pressure that director reputation brings (Nili, 2015)
The age and tenure of the Chairman of the Board (COB) are statistically significant across 23 of the 24 total regressions, in all three samples, with only a considerable decrease in statistical significance for the COB tenure variable in the segment of funds that do charge 12b-1 fees (Table VIII). Within the full sample, table VI reflects that the age and tenure of the COB are each negatively related with brokerage commissions for all of the regression models; with a slightly lower impact in the clustered statistical analysis but overall sharing the highest significance level (p<0.001). As the age of the COB increases by one year average brokerage commissions decrease (β=-0.08, p<0.001) in three out of the four regressions (standard OLS, robust, and White models) the impact is more modest in the clustered model (β=-0.06, p<0.001). Longer COB tenure is also statistically significant in the full sample (Table VI) and is connected to a decrease in the brokerage fees paid by mutual fund customers (β=-0.05, p<0.001). In the clustered regression model (Table VI), the impact is smaller again (β=-0.03, p<0.10). These connections are very similar in the sample excluding index funds from table VII. Focusing again on the actively managed population of mutual funds, an additional year in COB age is parallel to a reduction in brokerage commissions (β=-0.08, p<0.001), for all regressions except the clustered statistical model, which sees a smaller decrease on brokerage fees (β=-0.06, p<0.001). Similarly, in table VII, increasing the COB tenure by one year is reflected by a reduction in brokerage commissions (β=-0.06, p<0.001), in the standard OLS, robust, and heteroscedasticity-consistent regression models. According to table VII, additional COB experience decreases brokerage fees by a smaller amount in the clustered model (β=-0.04, p<0.001). The results in table VIII, reflect the behavior of the population of mutual funds that charge 12b-1 fees, this section has the smallest number of observations among the three cross-sectional samples considered and accordingly it commands smaller coefficients, and in the case of COB tenure also a substantial reduction in the confidence level (p<0.10). In table VIII, an additional year in the COB age is mirrored by a decrease in brokerage commissions across all four regressions maintaining a high level of statistical significance (β=-0.04, p<0.001 to p<0.01). A more muted confidence level (p<0.1) materializes in the sample of mutual funds charging 12b-1 fees (Table VIII) when the impact of COB tenure is concerned. In three out of the four models considered in this sample, there is a statistically significant
decrease in brokerage commissions accompanying one additional year of COB service to the board ($\beta=-0.04, p<0.10$). As per usual, the smallest connection with having the same chairman for one additional year appears in the clustered regression model performed on mutual funds charging 12b-1 fees ($\beta=-0.03, p<0.10$). In regards to the effect of boards longevity and specifically of directors’ tenure on corporate governance and board efficiency, Del Guercio et al. (2003) focus on closed-end funds to find that longer tenure reduces directors’ independence and their ability to serve customers’ interest. Simultaneously, the authors also contemplate possible gains in board efficiency resulting from longer serving directors with more experience to no avail (Guercio, Dann, & Partch, 2003). Ferris and Yan (2007) find a similar relationship to the one just reported from my findings when considering the number of years an independent director serves on the board and turnover ratio. However, they are disappointed since they cannot establish a statistically significant relationship between tenure and the probability of mutual funds suffering an accounting scandal (Ferris & Yan, 2007). Furthermore, the authors find a direct and statistically significant relationship between director’s tenure and expense ratios. Nonetheless, in Ferris and Yan’s (2007) study as it happens in my analysis, the magnitude of the impact of tenure on turnover ratio is among the smallest in their regression. It could be extracted from my results that COB that retain their position over a longer period of time exercise a positive role maintaining brokerage fees at a lower level. If they can in fact exercise any influence on managers to limit their trading through service brokers or to reduce their overall trading activity that would have a positive impact on mutual fund customers, which should be the COB’s main focus.

Continuing the debate around busy boards, the number of funds supervised by the chairman of the board appears to be statistically significant across all twelve regressions. The relationship between the number of funds supervised by the COB and brokerage commissions is negative, indicating that an increase in the number of funds overseen by the chairman does not limit his capacity to exercise any kind of pressure to reduce or limit brokerage fees. Starting with table VI, which includes all the mutual funds in the cross-sectional sample, and table VII, focused around actively managed funds, any additional fund
supervised by the COB accompanies a miniscule decrease in brokerage commissions ($\beta=-0.02$, $p<0.001$); as usual a more mitigated impact exists according to the results obtained by the regressions with clustered standard errors ($\beta=-0.01$, $p<0.01$). Finally, deriving results from funds that charge 12b-1 fees in table VIII, suggests also that additional fund supervised by the chairman reduces brokerage commissions ($\beta=-0.01$, $p<0.001$ to $p<0.05$). Perhaps, the results lack intuitive appeal; however, the magnitude of the increase might not be worthy of practical significance. Hence, higher COB activity might not have the collateral effect of increased commissions on mutual fund customers. An early study coauthored by Ferris in 2003, looks into the ‘director busyness hypothesis’ approximated by the number of external board appointments held by independent directors. This study’s results partially corroborate my findings; their empirical results suggest that the fact that directors serve on multiple boards has no discernable effect in their responsibilities to serve shareholders. The authors affirm that their findings debunk prior notions that propose to put limits on the number of directorships held by independent directors (Ferris, Pritchard, & Jagannathan, 2003). Nevertheless, Ferris revisits this topic in a more recent work, Ferris and Yan (2007), here the authors line up against the conclusions reached in my regression analyses. They study the effect of the number of funds overseen by independent directors, instead of chairmen of the board, on expenses. They share a statistically significant and positively association between the number of funds overseen by independent directors and mutual fund expense ratios; suggesting a reversal on the ‘director busyness hypothesis’ from Ferris’ et al. (2003) initial position and the results that I have uncovered.

On June 23, 2004, newly proposed SEC regulation required every mutual fund to have an

**independent chair** and at least three-quarters of independent director in their boards. This rule is widely controversial; it raised questions about the efficacy of independent boards. Congress requested the SEC to provide evidence demonstrating that mutual funds’ customers benefit from having independent chairmen. By 2006 the SEC had refused to contest the decision and the federal court of appeals invalidated the 2004 regulation. However, the ICI, in its Overview of Fund Governance Practices 1994–
2014, reports that at year-end 2014 sixty-five percent of all fund boards have independent chairs. In my study, the CEO also serves as the non-independent COB in 44 percent of my cross-sectional sample, approximately 560 mutual funds. Having the same executive sharing the roles of CEO and COB, which is frequently known as dual CEO, appears to be statistically significant across seven of the twelve regressions considered under the three different samples; with the usual decrease in statistical significance in the clustered methodology. The statistically significant regressors indicate a sizable increase in brokerage commissions for mutual funds that lack independent COBs. Table VI shows the results from four regressions conducted against the entire population of mutual funds collected, the dichotomous variable that identifies if the CEO occupies also the role as the board chair (Dual CEO) appears to be statistically significant and suggests a direct relationship with brokerage commissions; the magnitude and statistical significance decreases for the clustered error regressions. In the full sample, having an interested COB that also serves as CEO of the mutual fund is connected to an increase in average mutual fund brokerage fees of approximately one percent (p<0.001 to p<0.05). Similar effects are observed in the sample that excludes index mutual funds, table VII; now a dual CEO also relates to an increase in brokerage commissions, which are 0.8 percent higher (p<0.01), for the standard OLS, robust, and heteroscedasticity-consistent regressions. In all other models, the results do not grant statistical significance. Kong and Tang’s (2008) findings indicate that boards with more independent members charge higher fees, have higher director pay, and rank lower in the Morningstar stewardship score. Mutual funds with boards composed by more than three-quarters of independent directors reach a lower stewardship score, 3.15 starts, than those with less independent boards, which average stewardships of 3.85 stars. Furthermore, the authors find that boards led by an independent COB receive on average a lower score on stewardship (2.77 stars) compared to boards that have an affiliated executive in charge, which receive a higher stewardship score (3.56 stars). Kong and Tang (2008) also include a categorical independent COB variable in all their regression models and they find a positive but not statistically significant effect on expense ratios, and 12b-1 fees, which therefore align with my own results (Kong & Tang, 2008).
VI. A. ii. Cross-sectional Hypothesis II

Hypothesis II:

In testing my second hypothesis that posits that, after controlling for other influential factors, funds with higher expense ratios would tend to also have higher brokerage fees, I run four regression models on three alternative samples, a total of 12 regression analyses.

\[
\text{Brokerage Fees}_{it} = \alpha_{it} + \beta_1 \text{Fund Characteristics}_{it} + \beta_2 \text{Expense Ratio}_{it} + \beta_3 \text{Fund Turnover}_{it} + e_{it} \tag{2}
\]

Expense variables and mutual fund characteristics are run as determinants of brokerage fees using the standard OLS, robust, White, and clustered regression models. The four expense characteristics included in this model are: the leftover portion of the expense ratio after excluding management fees and 12b-1 fees, management fees, 12b-1 fees, and the percentage of the mutual fund’s total assets that the portfolio manager keeps as cash. The models also include mutual fund characteristics as control variables to account for mutual funds’ traits that the prior financial literature finds relevant explaining variation is mutual funds’ expenses. In addition, three sample variations are employed for each of these four regressions models: the full sample, a sub-sample excluding index mutual funds, and a second sub-sample of mutual funds that charge 12b-1 fees. Statistically significant regressors are discussed below with comparisons made across regression models and across sample variations.

[Insert Table IX here]

Table IX summarizes the regressions results for the relationship between brokerage commissions and other mutual fund expenses, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in my second hypothesis and modeled by equation (2), across four different methodologies. The regression models are very consistent with an F=44.5 (p< 0.001). The Chi-Square for the White regression model is not significant disregarding the presence of heteroscedasticity. Furthermore, there are
not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explained more than half of the variation in brokerage commissions for 2015, with an adjusted $R^2=0.52$ for the full sample. All of the expense variables included have a statistically significant role in the regression model. The list of the four expense regressors in order of their contribution to explain variation on brokerage commissions is: 12b-1 fees, fund cash holdings, management fees, and the leftover portion of expense ratio after excluding management fees and 12b-1 fees. The intercept and three additional control variables: investment objective, family category, and turnover ratio, are also significant. Furthermore, the control variables are consistent with the prior literature in the direction and magnitude of the relationship, and even when they are not significant, as is the case for the index categorical variable they exhibit a sign, negative, that is logical given what is known in regards to how mutual funds operate.

[Insert Table X here]

Next, table X summarizes the regressions results for the relationship between brokerage commissions and other mutual fund expenses in the first cross-sectional sub-sample, which excludes index mutual funds for the year 2015, as discussed in the second hypothesis, and modeled in equation (2), across four different methodologies. In this sub-sample, clear of index mutual funds, the overall model is still significant but commands a lower F ratio ($F=40.29$, $p<0.001$). The Chi-Square for the White regression model is significant ($\chi^2=106.91$, $p<0.01$) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The percentage of the variance of brokerage fees explained by the linear combination of the expense ratio regressors is also nominally lower (adjusted $R^2=0.43$). However, this muted effect is likely due to the smaller sample size. Largely, the same independent variables are statistically significant in both samples but with muted p-values in this smaller sample that excludes index mutual funds. Three out of the initial four expense regressors remain significant, in order of their contribution to explain variation on brokerage commissions the statistically
relevant explanatory variables are: 12b-1 fees, and the remaining expense ratio after excluding management fees and 12b-1 fees. Additionally, the intercept and now four control variables: investment objective, family category, return, and turnover ratio, are also significant. The control variables are consistent with the prior literature in the direction and magnitude of the relationship to the dependent variable.

[Insert Table XI here]

Finally, table XI summarizes the regressions results for the relationship between brokerage commissions and other mutual fund expenses in the second cross-sectional sub-sample, which focuses on mutual funds that purposely charge 12b-1 fees for the year 2015, as discussed in hypothesis two, and modeled in equation (2), across four different methodologies. This third sample, which focuses on a pool of mutual funds that charge 12b-1 fees, has the most similarities with the sample excluding index mutual funds, with the F statistic (F=41.52, p<0.001) likely due to a similarly smaller sample size. The Chi-Square for the White regression model is not significant disregarding the presence of heteroscedasticity. Furthermore, there are not significant differences in the F, R², or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. However, the overall variance explained in brokerage commissions by the linear combination of expense factors and control variables reaches 66 percent, which is much higher than the adjusted R² for the sample excluding index mutual funds that only explains 44 percent of the variance. Six variables are statistically significant regressors of brokerage fees across all three samples and all four models: objective, family, turnover ratio, management fee, 12b-1, and percentage of cash. Among these statistically significant variables, all except one of the expense regressors, the fund’s cash holdings, remain relevant throughout.

The investment objective regressor behaves similarly in the regressions run for hypothesis 2 as it does in the regressions run across all 12 regressions for hypothesis one; only small variations are found in the coefficients and the p-values are largely identical. As mentioned in the introduction for tables VI, VII, and VIII, there are three investment objective categories reported by CRSP: domestic equity, international
equity and bonds. Only domestic equity and domestic bonds are part of this study. I introduce domestic equity as the baseline investment category in the model. Across all four models, investment objective is a statistically significant and the control group, domestic equity, has a negative association with brokerage commissions ($p<0.001$). For three of the four models, the investment objective variable shares the same coefficient ($\beta=-2.31$) with a slight difference in the clustered model ($\beta=-2.20$). As in the prior three tables that relate corporate governance characteristics with brokerage commissions, the investment objective’s negative beta signals that, on average, domestic equity funds paid higher brokerage commissions than the rest of mutual funds with competing investment goals, after controlling for other mutual funds characteristics that might affect brokerage commissions. For three out of the four models, an investment objective of domestic equity increases brokerage commissions by 2.3 percent with respect to the other investment objective category; in the clustered regression model the impact of investment objective on brokerage fees is slightly smaller in absolute terms, 2.2 percent, and in statistical significance but the coefficient statistically differs from zero at the five percent level. This relationship remains in the smaller sample excluding index mutual funds, although with a smaller coefficient ($\beta=-1.45$, $p<0.001$) for the first three regression models tested and for the clustered regression, which again presents a slightly smaller impact in absolute value ($\beta=-1.4$, $p<0.01$). Alternatively, in the smaller sample of mutual funds that charge 12b-1 fees, investment objective has a more dramatic negative relationship with brokerage fees ($\beta=-3.09$, $p<0.001$) for the OLS, robust, heteroscedasticity-consistent, and clustered regression models.

Overall, through the four different regression models and the three sub-sample iterations investment objective remains statistically significant and with a negative coefficient, which indicates that equity funds tend to charge, on average, higher brokerage commissions than their fixed income counterparts after controlling for relevant mutual fund characteristics.

The second relevant control categorical variable listed in the regression models, family membership, is also categorical and therefore enters into the regression models as a dummy variable. Considering first the entire cross-sectional sample, family membership is statistically relevant for all three
of the four models (OLS, robust, and White) in which it is introduced as an independent variable. For the control group, the regressions indicate higher brokerage fees, (β=-0.027) with respect to the rest of the families in the entire sample. The statistical significance of this coefficient peaks with the standard OLS regression (p<0.01); the next two methodologies (robust and heteroscedasticity-consistent regressions) account for a smaller statistical significance of results (p<0.05). Similarly, for table X, focused in non-index mutual funds, the family categorical has a smaller negative impact on brokerage fees (β=-0.01), which translates to a nominal change in the percentage of brokerage fees, and exhibits a more muted statistical significance (p<0.05). Finally, family membership is not a statistically significant regressor of brokerage fees for the mutual funds that charge 12b-1 fees. As it is customary, across all three samples (Tables IX through XI), the family membership variable drops out of the clustered regression, since the variable is introduced as in the form of over 35 clusters representing each mutual fund family.

As it occurred in the initial 12 regressions that try to illuminate the relationship between corporate governance characteristics and brokerage commissions around my first hypothesis, exposed in the prior section, mutual funds’ returns do not show a statistically significant association with brokerage fees for the full sample (Table IX) nor the sample of mutual funds charging 12b-1 fees (Table XI) for any of the eight regression models. However, as it also happens in the corporate governance approach to brokerage commissions, mutual funds returns are statistically significant and negatively related to brokerage fees for the sample excluding index mutual funds (Table X). The coefficient is negative and reaches a higher statistical significance outside of the OLS regression where it remains significant at the five percent level. The effect of mutual fund performance on brokerage commissions (β=-1.4, p<0.01)) remains constant in the OLS, robust, and heteroscedasticity-consistent regression models. However, the coefficient is slightly smaller in absolute value for the clustered model (β=-1.3), but still enjoy the same degree of statistical significance (p<0.01). It is not coincidental that the inverse relationship between return and brokerage commissions is only significant once the regressions focus on non-index mutual funds, which are actively managed. This relationship, combined with the fact that the average and median performance of all the
funds in the sample is notably negative, reaffirms the failure of professional mutual fund managers, with their frequent trading, to generate persistent positive returns. The negative and significant coefficient accompanying actively managed mutual funds returns indicate that frequent trading constitutes a net expense for investors and could be consider proof of market efficiency.

As expected, across all three samples (full, minus index mutual funds, and funds charging 12b-1 fees), turnover ratio is a positive statistically significant regressor (p<0.001). Turnover ratio identifies the portion of a fund's investments that has been bought and sold over the past year. Thus, a higher turnover rate translates to higher brokerage commissions. For my full population of mutual funds (Table IX) and the sample of mutual funds charging 12b-1 fees (Table XI) there is a very similar effect of turnover rates on brokerage fees; an increase in turnover ratio of one percent prompts, on average, an increase in brokerage fees that ranges from six to seven percent. The impact is smaller in the sub-sample that isolates non-index mutual funds. This effect is also approximately equal to the impact that turnover ratio has on brokerage commission on the regression considering governance characteristics. Table X summarizes these results for the actively managed funds and establishes that, on average, increasing turnover ratio by one percent correspondingly increases brokerage commissions by three percent. Additional mutual fund characteristics included as control variables and tested throughout all the twelve models include: fund life, an index categorical variable (Index Flag), and an institutional categorical variable (Institutional Flag). These three control variables have coefficients close to zero (little to no linear relationship) and are not statistically significant regressors of brokerage fees. Although, not statistically relevant both fund life and the index categorical variable show consistently negative coefficients. The negative sign and the magnitude of the coefficient accompanying fund life is similar to the one found in the prior twelve regressions conducted around corporate governance and brokerage expenses where, fund life appears moderately significant. The expense coefficients in the variables of interests are probably capturing much of the variation in brokerage commissions that is previously encapsulated in the index categorical variable. The lack of soft dollar compensation when dealing with index funds is probably responsible for
the lack of statistical significance. The possibly inefficient behavior surrounding service broker trades is captured well by the expense variables of interest.

All four expense characteristics (expense ratio, management fee, 12b-1, and percentage of cash) are statistically significant in the full sample (Table IX) across all four regression-models. As stated in my second hypothesis, I expect to find a significant relationship between other mutual fund expenses and brokerage commissions. It is reasonable to assume that funds that have, on average, higher expenses than their peers might also have structural characteristics in place that cause their brokerage commissions to be higher. The results mostly confirm my results, albeit the peripheral mutual fund expenses (12b-1 fees and cash holdings) have different relationships with brokerage commissions, which make the understanding of the interconnections among mutual funds expenses and brokerage commissions even richer.

For the full sample, across most of the first three regression models, an increase of one percent in the expense ratio excluding management fees and 12b-1 fees is significantly linked to a 0.09 percent increase in brokerage commissions. This coefficient is statistically significant at the five percent level in the robust and heteroscedasticity-consistent regressions and at the one percent level for the standard OLS and clustered-errors regressions. Both amounts are relatively small; however, table II, the cross-sectional dataset descriptive statistics, reveals that median expense ratio, excluding management fees and 12b-1 fees, is 0.02 percent and the median brokerage commission reaches 0.08 percent. Therefore a one percent and a 0.09 percent are very large increases relative to their magnitude. Besides, the median fund has over $220 million dollars in net asset value and these commissions’ and fees’ percentages are computed with respect to net asset values. Hence, combining both median figures anchors the one percent change in expense ratios at about $2.2 million dollars and the change in brokerage commission very close to two million dollars. Analogously, for the entire sample analysis, the impact of the relationship between brokerage commissions and the expense ratio slightly decreases in magnitude for the clustered-error regression model (0.07 percent) but regains statistical significance (p<0.01). This link is similar in the sample of mutual funds charging 12b-1 fees (Table XI) with a one percent increase in the expense ratio
suggesting a 0.07 percent increase in brokerage fees, reaching a high statistical significance level for the standard OLS and the clustered-error regressions (p<0.01). The relationship is even stronger for the first three regressions (OLS, robust, and heteroscedasticity-consistent models) in the sub-sample excluding index mutual funds, where a one percent increase in the expense ratio is associated with a 1.15 percent increase in brokerage fees (p<0.01 and p<0.001). The fact that this analysis shows such a decisive relationship between the remaining portion, after excluding management fees and 12b-1 fees, of mutual funds’ expense ratios and brokerage commission might be signaling a lack of efficiency on how the fund manages its costs.

The behavior of management fees is consistent across all three samples and all four regression models with an overall statistical significance of p<0.001 and similar regression coefficients for the 12 analyses. In the full sample (Table IX), a one percent increase in manager fees is associated with an average 0.86 percent increase in the brokerage commissions (p<0.001). Similarly, in the analysis excluding index mutual funds (Table X), a one percent increase in management fees accompanies a 0.7 percent increase in brokerage commissions (p<0.001). Finally, the largest increase appears in the sub-sample charging 12b-1 fees (Table XI) with a 0.9 percent increase in the brokerage commissions for each one percent increase in management fees (p<0.001). The fact that brokerage commissions’ relationship is particularly strong and constant with management fees, hints again to corporate culture or underlying fund or family structures guiding the level of brokerage commissions and tipping them towards higher than necessary levels. These results indicate that mutual fund managers are compensated more just for the volume of transactions they execute in the fund. If management compensation is tied to their productivity, or the amount of work they do, how actively they trade has to influence their pay. It is reasonable to assume that somehow their salary is related to their performance and the fund’s return. However, as discussed before, trading more frequently does not help funds’ performance, on the contrary, most likely it tempers it. The fact that now one can see this positive relationship between management fees and brokerage commissions solidifies the idea that frequent trading should be discouraged.
Management fees are paid to mutual fund families in exchange for selecting someone to run the fund and providing them with the infrastructure for portfolio investment, research, distribution, etc. (Freeman, Brown, & Pomerantz, 2008). Mutual fund parent companies charge all the mutual funds they have created several commissions in exchange for providing all the services listed before. The sponsor also retains board presence since no mutual fund board is fully independent. Freeman et al. (2008) finds management fees excessive and the result of the captive boards and what it is known in the industry as ‘external management’. External management relates to the fact that virtually all mutual funds are run by outside manager-service providers, which are usually the sponsors. The authors compare management fees charged by Vanguard’s funds, which have a truly independent board vetting funds fees, with management fees charged by mutual funds from the rest of the industry. Management fees charged outside of Vanguards’ funds are comparatively larger compared to similar fees accrued for management services in competitive markets and enable mutual fund families to secure ‘economic rents’, profits reserved to companies conducting business in markets with low competition or market power (Freeman, Brown, & Pomerantz, 2008). As mentioned in the data section, brokerage fees do not operate in a standard competitive setting. Fund managers are not required to transact selecting the most cost-effective bid, they have free range to pick non-competitive bids to solidify a long-term fund-broker relationship or in exchange for soft-dollar compensation. Seeing such solid link between the non-competitive brokerage commissions and the possibly inflated management fees through the 12 different models may suggest that the same transversal underlying forces maybe resulting from corporate culture are helping to shape both.

The coefficient on 12b-1 fees is negative and mostly a statistically significant determinant of brokerage fees across all three samples and all four regression-models with variation in the level of statistical confidence (ranging from 90 percent to 99.9 percent). In the full sample (Table IX), a one percent increase in 12b-1 fees is significantly associated with an over 0.8 percent decrease in brokerage fees. The significance level is stronger in the robust and heteroscedasticity-consistent models (p<0.05) than in the standard OLS or clustered-error regressions (p<0.10). Within the second sub-sample, which
excludes index mutual funds, the magnitude of the coefficient increases and the significance level remains constant through the standard OLS, robust, and heteroscedasticity-consistent regression models (p<0.05). In this case (Table X), non-index funds, a one percent increase in 12b-1 fees, on average, is significantly related to a 1.5 percent decrease in brokerage fees. The significance levels (p<0.001) exceed all the prior models for the sub-sample of mutual funds that specifically charge 12b-1 fees (Table XI). In this case, a one percent increase in 12b-1 fees, on average, is significantly connected with an almost 0.8 percent decrease in brokerage commissions. It is particularly well suited that the effects of 12b-1 fees became so much prevalent in the sample that zeroes in on the mutual funds that specifically charge them.

Like 12b-1 fees, the percentage of cash in the fund has varying levels of confidence in its connection with brokerage fees across the three samples and the four regression models. The fund cash holdings is a statistically significant negative regressor of the brokerage fee in the full sample (Table IX) at the p<0.05 level for all but the clustered model, where the confidence level is higher (p<0.01). In the full sample, a one percent increase in the percentage of cash held by the fund accompanies approximately a 0.12 percent decrease in the brokerage fees. In the sample excluding the index mutual funds, the percentage of cash is not a significant regressor and the coefficients are virtually zero. Finally, the percentage of cash is a significant regressor of brokerage fees (p<0.10), in the sample charging 12b-1 fees (Table XI) for the robust, heteroscedasticity-consistent, and clustered regression models, with an average 0.08 percent decrease in brokerage fee for each one percent increase in the percentage of cash. It is logical to have brokerage fees decreasing as a consequence of increasing the portion of cash remaining in the portfolio. If nothing else, having more cash in hand means less money invested in securities, fewer transactions, and lower brokerage commission. Furthermore, cash holdings must also limit the need to transact and the impact of brokerage commissions because it should undermine the impact of withdrawals. Sometimes brokerage commissions are not originated by a manager’s desire to vary the composition of the portfolio of investments but to satisfy the requirements of mutual fund customers that demand redemptions in their investments from the fund. Having cash available should significantly
reduce the need to exit costly investment to satisfy customers’ requests to withdraw their positions in the fund. Although this result is not terribly revealing, it is a confirmation of the validity of this hand-collected sample and increases the confidence in the insight gained from this study.

VI. A. iii. Hypothesis III

Hypothesis III:

Higher executive compensation, controlling for other possible characteristics that influence executive salaries according to the prior financial literature, is prone to appear in mutual funds with weaker corporate governance structures in place.

\[ \text{Dir. Comp}_{it} = \alpha_{it} + \beta_1 \text{Dir. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \quad (3) \]

\[ \text{COB Comp}_{it} = \alpha_{it} + \beta_1 \text{COB Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \quad (4) \]

\[ \text{Mngr. Comp}_{it} = \alpha_{it} + \beta_1 \text{Mngr. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + e_{it} \quad (5) \]

In testing my third hypothesis, which posits that funds with stronger corporate governance culture in place should present lower executive pay, controlling for other possible characteristics that the financial literature has suggested influence executive compensation, I run four regression models: standard OLS, robust, White, and clustered errors. I employ three alternative mutual fund samples when approaching independent director compensation, and alternatively the entire sample of funds for chairman of the board compensation and manager compensation.

Mutual fund characteristics and board of directors or corporate governance characteristics, including independent directors’ and chairmen’s traits, are included as regressors of executive compensation using the OLS, robust, White, and clustered regression models, though five iterations for a
grand total of twenty regressions. Ten corporate governance characteristics are included as variables of interest in this model: number of independent directors, number of female directors, number of funds overseen by the director, directors’ fund ownership, committee meetings, Chairman of the Board (COB) age, COB tenure, COB fund ownership, dual CEO/COB status, and number of other officers. All the models employ the same variables and also include mutual fund characteristics as control variables to account for mutual funds’ individual traits. The mutual fund characteristics included as control variables are reliable explaining variation in mutual funds’ expense ratios in the prior financial literature and they comprise: fund investment objective, TNA, return, fund life in years, categorical variable related to family membership, dichotomous variable to identify index funds, binary variable assigned to institutional funds, and manager tenure. Centered around director pay as dependent variable, each of the four regressions models are tested using three sample variations: the full sample, a sub-sample excluding index mutual funds, and a second sub-sample that only includes mutual funds that charge 12b-1 fees. COB pay and manager compensation are only tested in the entire manually collected cross-sectional population of mutual funds for 2015. Statistically significant regressors are discussed below with comparisons made across regression models and across sample variations.

Table XII summarizes the regressions results for the relationship between independent director compensation and board of directors characteristics, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis three and modeled by equation (3), across four different methodologies. The regression models are very consistent with an F=47.8 (p< 0.001). The Chi-Square for the White regression model is significant ($\chi^2=421.11$, p<0.01) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. Nine of the ten governance variables of interest have statistically significant roles in the regression model. The independent variables explain more than half of the variation of director compensation for 2015, with an adjusted $R^2=0.6$ for the full
sample. The list of the nine corporate governance regressors in order of their contribution to explain variation on director compensation is: number of female directors, dual CEO/COB status, number of independent directors, committee meetings, COB tenure, COB age, and the number of funds overseen by the COB. The intercept is statistically meaningful, and five control variables are also significant, in order of their contribution to the variability of the director pay: institutional flag, TNA, investment objective, fund life, and family category. Most control variables regardless of their significance levels exhibit the sign and magnitude that is expected judging by the results gathered in my literature review. Each statistically significant variable is individually discussed below. This overall consistency of the control variables reinforces the validity and representativeness of the sample.

[Insert Table XIII here]

Table XIII summarizes the regressions results for the relationship between independent director compensation and corporate governance characteristics in the first cross-sectional sub-sample, which excludes index mutual funds for the year 2015, as pictured by my third hypothesis, and modeled by equation (3), across four different methodologies. In this sub-sample, excluding index mutual funds, the overall model is positively significant with a higher F statistic (F=53.12, p<0.001). The Chi-Square for the White regression model is significant ($\chi^2=299.95$, p<0.01) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The percentage of the director pay variance explained by the linear combination of the corporate governance regressors is technically lower (adjusted $R^2=0.57$) but still remain above 50 percent. Largely, the same independent variables are statistically significant in both samples and even show higher statistical significance in this smaller sample that excludes index mutual funds. All but one of the initial ten corporate governance regressors emerge as statistically significant at least in one of the regression models. The intercept and five of the control variables also appear statistically significant once index funds are excluded.
Table XIV summarizes the regressions results for the relationship between independent director compensation and corporate governance characteristics in the second cross-sectional sub-sample, which excludes mutual funds that do not charge 12b-1 fees, for the year 2015, as discussed in my third hypothesis, and modeled by equation (3), across four different methodologies. In this sub-sample, of only mutual funds that charge 12b-1 fees, the overall model is significant, albeit has a lower F ratio (F=31.67, p<0.001) than its two predecessors. The Chi-Square for the White regression model is significant ($\chi^2=222.45, p<0.01$) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The percentage of director compensation variance explained by the linear combination of the corporate governance reaches a higher level (adjusted $R^2=0.62$). Largely the same number of control variables remain significant compared to the full sample while there is slightly less consistency in regards to the variables of interest across all four regression-models for this sample. Again, nine out of the initial ten corporate governance regressors remain significant but the order of their contribution changes slightly: number of female directors, number of independent directors, CEO duality, directors fund ownership, COB fund ownership, COB age, COB tenure, and manager tenure. In this analysis the intercept and all but one control variable are also significant; in order of their contribution to explaining director compensation the controls are: institutional dichotomous variable, investment objective, index flag, TNA, number of other officers, family category, and fund life. Statistically significant controls and variables of interest are presented below

Table XV summarizes the regressions results for the relationship between independent COB compensation and corporate governance characteristics, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis three and modeled by equation (4), across four different methodologies. The regression models are consistent with an F=55.88 (p< 0.001). The Chi-
Square for the White regression model is significant ($\chi^2=113.05, p<0.05$) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain more than half of the variation in COB compensation for 2015, with an adjusted $R^2=0.66$ for the full sample. Four of the six corporate governance variables of interest have statistically significant roles in the regression model. The list of the four corporate governance regressors in order of their contribution to explaining the variation in COB compensation is: COB ownership, number of independent directors, COB age, and number of funds overseen by COB. The intercept is statistically valid, and only one other control variable, TNA, is significant. All of the control variables regardless of their statistical significance exhibit the direction in their relationship to COB compensation that is expected according to the prior literature; each variable is individually discussed below.

[Insert Table XVI here]

Table XVI summarizes the regressions results for the relationship between mutual fund manager compensation and Board of Directors (BOD) or corporate governance characteristics, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in my third hypothesis presented by equation (5), and across four different methodologies. The regression models are reliable with an F=33 ($p<0.001$). The Chi-Square for the White regression model is significant ($\chi^2=239.30, p<0.05$) indicating heteroscedasticity is present. However, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain more than half of the variation of manager compensation for 2015, with an adjusted $R^2=0.52$ for the full sample. Half of the ten corporate governance variables of interest have statistically significant roles in the regression model. The list of the five BOD regressors in order of their contribution to explaining the variation on manager compensation are: number of independent directors, committee meetings, directors’ fund ownership, COB tenure, and the number of funds overseen by COB. The intercept is statistically meaningful, and all but one of the eight control variables is statistically
significant, albeit at varying degrees depending on the model considered. All control variables regardless of their significance levels exhibit the sign and magnitude that is expected judging by the prior literature. Each significant variable is individually discussed below. The strong overall consistency of the control variables reinforces the validity and representativeness of the sample.

One could expect the determinants of independent directors or independent chairman compensation to be intrinsically different from the determinants of mutual fund manager compensation given the largely different roles that both figures play in the functional organization of mutual funds. Mutual fund managers are involved in determining and executing the primary investment strategy of the mutual fund portfolio. The COB acts as a liaison between the board of directors and fund executives; and the directors of the board are ultimately responsible for ensuring that the interests of the mutual fund customers are prioritized. Nevertheless, for the purpose of this analysis and to reveal and contrast the similarities and differences in the way corporate governance plays a role on the variation of the compensation of these three different roles, the effects are observed across all three dependent variables. CEO compensation has become more performance based over the past few decades (Lowenstein, 2012); similarly, I expect mutual fund manager compensation to be to a greater extent performance based. With respect to how the subjects of this study relate to each other, management fees are inversely related to director and COB compensation. Almost 97 percent of the funds in their sample, which include 5,000 mutual funds in 2011, report paying their portfolio managers variable compensation (Ma, Tang, & Gómez, 2015). However, as mentioned earlier in the literature review, the SEC prohibits incentive fees to be paid to mutual fund managers unless they are symmetric. On the contrary, there is no reason to suspect that director or COB compensation, whose primary focus is to protect the interests of shareholders and to supervise the firm's executive officers, has moved towards more variable or performance-based pay because the focus of their role is not as dynamic as the one faced by portfolio managers. Therefore, the differences in compensation among mutual fund managers, directors, and COB
are expected to be partly driven by differences in the overall importance of the sources of their salaries, which may be largely fixed or rely on variable incentives (Oxelhein & Clarkson, 2015).

The **investment objective** categories reported by CRSP distinguish among three objective codes; only domestic equity, and bonds apply to this analysis. The most numerous investment objective, i.e. equity, is used as the control group for the model. Across half of the 20 regressions considered, which are the result of four statistical models applied to the entire cross-sectional dataset in three occasions for three different dependent variables, and the same four statistical models applied to two more different sub-samples dealing with director compensation exclusively, investment objective remains statistically significant throughout. The control group, equity, shows a negative coefficient in its relationship to compensation. Even when the control variable lacks statistical significance the negative sign still remains. In two of the full sample analysis, the one centered on director compensation and the one related to manager compensation, tables XII and XVI, the magnitude of the relationship between investment objective and compensation is strong. However, it reaches its zenith in the sub-sample for the analysis of director compensation that exclusively considers funds charging 12b-1 fees, table XIV. When the entire sample is used to analyze director compensation, table XII, for the standard OLS analysis, robust estimation, and heteroscedasticity-consistent regression model, the investment objective variable shares the same coefficient and statistical significance ($\beta=-0.19 \ p<0.05$). However, the objective variable has a larger magnitude, in absolute value, for the sub-sample that only includes mutual funds that charge 12b-1 fees ($\beta=-0.22 \ p<0.05$) across the standard OLS, robust, and heteroscedasticity-consistent regression models (Table XIV). This relationship between investment objective and compensation is more relevant in the entire sample that deals with manager compensation in table XVI. The impact of investment objective on manager pay has a stronger statistical significance ($\beta=-0.14 \ p<0.01$), which carries through the clustered error methodology ($\beta=-0.16 \ p<0.05$). The negative coefficient identified for investment objective indicates that, on average, the compensation paid to directors and managers from equity funds is comparatively higher than the compensation they receive from fixed income mutual funds, after
controlling for other mutual funds characteristics that might affect compensation, such as mutual fund size, longevity, or performance. It seems innately reasonable to assume that domestic equity funds pay higher compensation than their fixed income counterparts. Specially, if one assumes that trading in equity securities is more complex, dynamic, and competitive than trading in fixed income securities. Since McDonald’s (1974) classic paper on the relationship between mutual fund objectives and performance, other authors have identified investment objectives as a proxy for the risk level of a portfolio (Modigliani & Pogue, 1975; Starks, 1987). Khorana (1996) mainly focuses on determining how effective mutual funds boards are in replacing badly performing portfolio managers. She shares that equity funds are more volatile than debt funds. One would expect less risky funds to offer lower pay, because less complexity requires lower effort or skill from managers or directors. The biggest support to my results comes from Deli (2002). From a sample of over 5,000 open-end and closed-end funds for one year, 1997, he finds a strong link between marginal mutual fund manager compensation, scaled by TNA, and the funds’ investment objective. According to the author, the marginal compensation of equity funds managers is noticeably greater than debt fund managers pay, and the effect is even more significant for closed-end funds (Deli, 2002).

In order to control for size, which has proven to have direct consequences in mutual funds investment opportunities and performance, I regress compensation against total net assets. Accounting for the effect of mutual fund size allows me to eliminate from my regression analyses part of the idiosyncrasies that are inherent to larger funds and that might be influencing variability in compensation, which are competing with the effects of corporate governance on compensation, the focus of my analysis. In tables XII through XVI, comprising several iterations of all four models (OLS, robust, White, and clustered regression), across all three dependent variables (director compensation, COB compensation, and manager compensation), and through three samples in the realm of director compensation (entire, excluding index funds, and funds charging 12b-1 fees), i.e., in twenty different regressions, the effect of TNA is statistically significant in all but one of the regression models and it always suggests a direct
relationship to compensation. In my models, a change of one percent in TNA accounts for an increase in director and COB compensation, tables XII, XIII and XV respectively, of approximately 0.2 percent at the highest level of statistical significance (p<0.001), with diminishing significance for the clustered models (p<0.05). In the sample of mutual funds that charge 12b-1 fees, table XIV, the positive effect of fund size on director compensation is closer to 0.1 percent (p<0.05). In table XVI, a one percent increase in TNA has a negligible effect on manager compensation, causing a three basis point increase in compensation (p<0.10). Although the percentages changes in compensation associated with increases in TNA appear to lack economic significance, it is important to notice that TNA experiences very high variability. Table II, the cross-sectional descriptive statistics table, shows that the variance of the TNA variable for 2015 is almost three and a half times its mean. Hence, the small amounts in the percentage changes might be underestimating the economic importance of the variable. There are possibly contrarian forces that might be reflected in the effect of mutual fund size. Larger portfolios could be more complex and difficult to manage. Larger mutual funds might require additional effort from the manager in order to perform well and a deeper understanding from the board to supervise properly. However, larger portfolios could be also highly diversified and hence less risky, which might alleviate part of the pressure on management and the board. Contrary to my results, Deli (2002) uses a sample of over 5,000 management fees extracted from open-end and closed-end funds for the year 1997 to portray a negative relation between directors’ marginal management compensation and TNA. The author defines marginal compensation by taking the aggregate director compensation by family and scaling it by each of the individual funds’ TNA contained in the family. Although I am sure the author made provisions to ensure statistical soundness, it appears almost impossible to expect that marginal management compensation, scaled by TNA, would be anything but negatively related to TNA. Furthermore, Del Guercio et al. (2003) find a negative but not statistically significant relationship between director compensation and premiums from TNA on closed-end funds. However, according to the authors, premiums on closed end funds are not only a reflection of marker value but also may reflect possible agency concerns so comparing it my results might be potentially deceiving.
An alternative measurement for size in many disciplines is the number of employees or a qualified number of employees. A recent article by Gaffeo et al. (2003) analyze the size distribution of several groups of firms from the seven most developed nations as reported by the International Monetary Fund, i.e. the Group of Seven, from 1987 to 2000. The authors find several proxies for firm size, including the number of employees, which works particularly well identifying the connection between firm size and economic business cycles (Gaffeo, Gallegati, & Palestrini, 2003). In this analysis, number of other officers, a qualified number of employees type measure, identifies the number of high rank executives listed in the SAI of the mutual fund. The number of other officers only gathers limited statistical significance in the OLS model across the entire sample for director compensation. Hence, in table XII according to the standard OLS regression, increasing the number of officers is related to a minor reduction in director compensation ($\beta=-0.004 \ p<0.10$). For the sub-sample excluding index funds (Table XIII), there is a larger change in director compensation across the standard OLS and the clustered regression model ($\beta=-0.005 \ p<0.05$). The effect of additional officers gets stronger for the sub-sample of funds that charge 12b-1 fees (Table XIV; $\beta=0.03; \ p<0.05$). Finally, for managers in the full sample (Table XVI), there is a smaller but positive change in average compensation that is experienced across all four regression models and reaches the highest levels of statistical confidence ($\beta=0.005; \ p<0.001 \text{ to } p<0.01$).

To control for mutual fund performance I use the percentage increase in net asset value with respect to the year prior, 2014. Return, measured as the increase in NAV, is probably the most widely used profitability indicator by mutual fund customers. It captures the growth of the fund from the point of view of its direct investors. It should be the manager responsibility to ensure that investors are getting a continuous return in exchange for the capital they have provided to the mutual fund. The most important manager task from the mutual fund customers’ point of view is that they are getting a fair return in their investment. Furthermore, since the board of directors should act as the nexus between mutual fund managers and customers, is reasonable for the COB and independent directors, who by law are required to
exclusively occupy the seats in the compensation committee, to be concerned with mutual fund returns when making compensation decisions. Outside of the mutual fund vernacular, in the realm of the general corporate finance literature that deals with CEO compensation, it is frequent to encounter criticism in the way executives are compensated; often CEO pay is considered excessive and the CEO performance-based part myopic, because it largely focuses on the stock value over a short time-horizon. In my analysis however, coming from the almost complete statistical significance across all models that accompanied TNA’s influence on executive pay, just above, return is not associated with compensation in any of the twenty regressions considered across the five tables that relate COB, independent director, and manager compensation to corporate governance characteristics. Coles et al. (2000) find that in closed-end funds, the positive effect of TNA premiums paid by investors is a stronger determinant of mutual fund manager compensation for funds where manager compensation is relatively immune to performance. The authors employ the theory behind the standard moral hazard problem to highlight the importance of managerial compensation systems that are sensitive to performance as an incentive alignment mechanism and to avoid abuses on mutual fund investors (Coles, Suay, & Woodbury, 2000). Perhaps as Golec (2003) fears, the incentives put in place by the compensation schemes set by mutual fund families are more effective maximizing the sponsors’ fees, and therefore their revenue, than providing investors with higher returns. Based on my analysis, there seems to be a misalignment between the interest of mutual funds’ investors and the financial institutions managing their funds, judging by the way their executive salaries respond to TNA instead of performance. Khorana et al. (2007) studies the role of mutual fund boards in mutual fund mergers between 1999 and 2001. Indirectly, the authors are capable of carving a negative relationship between fund underperformance and director pay. They find that as board independence increases, their members are less likely to allow for underperformance and they are prone to initiate a merger. Although these types of mutual fund mergers benefit mutual fund investors, they are costly to fund directors, who frequently experience a substantial loss of their compensation following the merger (Khorana, Tufano, & Wedge, 2007).
To control for the number of years the mutual fund has been active, fund life, is included in the regressions. As presented in tables XII, XIII, and XIV, there is a very small positive and statistically significant relationship between mutual funds’ age and independent director compensation. However, although the same positive coefficient accompanies fund life in the regression against COB compensation the connection is no longer statistically significant. For the full sample, table XII, every additional year in the funds’ life conveys a minuscule increase in director compensation ($\beta=0.02$, $p<0.01$); the statistical significance slightly recedes for the clustered regressions model ($p<0.05$). Similarly, table XIII, concentrates on the sample excluding the index funds, reflects that for every additional year in the funds’ life, director compensation experiences an even smaller increase ($\beta=0.01$), which statistical significance falls considerably ($p<0.10$) and escapes completely the clustered model. This relationship gets revived in the sample of mutual funds charging 12b-1 fees, table XIV, fund life is a significant regressor in all but the clustered model ($\beta=0.02$, $p<0.01$). Although the magnitude and direction of the relationship remains stable, no statistical significance is found for fund life and COB compensation across the four regression models for the entire sample (Table XV). On the contrary, a smaller negative relationship is only significant for the impact of fund life on manager compensation within the White model with decrease in manager pay for each one year increase in the fund’s life ($\beta=0.03$, $p<0.10$); a similar pattern is found at an almost marginally significance level for the robust regression model (Table XVI). In terms of the relationship between the director compensation and the number of years since fund inception, Coles et al. (2000) derives statistically significant results from a sample of closed-end funds (CEF). The authors’ findings partly confirm mine; they establish a lower sensitivity of managerial compensation to CEF performance as the fund becomes older. Furthermore, in their small sample of 32 CEFs, the authors share that applicable marginal compensation, which is manager compensation scaled by TNA, is almost monotonically increasing with every additional year in their sample (Coles, Suay, & Woodbury, 2000).

The family of funds categorical variable demonstrates limited statistical significance across the entire sample for compensation of independent directors, independent COBs, and mutual fund managers.
Statistical significance is present most frequently in the OLS model across all samples and executive roles. For instance, in table XII, the difference in average director compensation from the family control group to the other mutual fund families is a negligible increase ($\beta=0.012$, $p<0.10$). In table XVI, a change in the funds family conveys an even smaller increase in the average manager compensation compared to the family control group ($\beta=0.007$, $p<0.05$). For mutual funds in the sample excluding index funds (Table XIII), the change in average director compensation is larger than the one present in the entire sample for director compensation. This larger effect is experienced across all four regression models and reaches the highest levels of statistical confidence ($\beta=0.03$ $p<0.001$). In table XIV, for the sample of mutual funds that charge 12b-1 fees, the magnitude and direction of this relationship also holds across three of the four regression models ($\beta=0.02$ $p<0.05$ to $p<0.10$). There is no significant relationship across the four regression models for COB compensation and family of funds. The regressions indicate that the family control group on average pays lower salaries to its directors and mutual fund managers than the rest of the families in the sample.

**Index flag** is a dichotomous variable designed to identify whether a mutual fund is actively managed or merely intends to replicate a stock index. As such, it varies in the way it impacts the compensation of independent directors, independent COBs, and managers. As noted in table XII, when examining the impact of index funds passive management on director compensation, while a strong negative relationship is present, index flag almost reaches statistical significance at the ten percent level in two of the four regression models (robust and White) ($\beta=-0.1$). This relationship, when observed in table XIV, is larger in magnitude and more robust in statistical significant for the sample of director compensation extracted from funds that charge 12b-1 fees. Table XIV shows a decrease in average director compensation of 1.6 percent when comparing index funds to actively managed funds across OLS, robust, and White regression models ($p<0.01$ to $p<0.05$). On the contrary, index flag does not appear to be a significant regressor of COB compensation. The index categorical variable is a negative regressor of manager compensation in the entire sample at the highest significance levels, identifying an average
lower pay for managers in charge of index funds compared to those from actively run mutual funds ($\beta = -0.283$, $p<0.001$). However, most index funds, at least according to their prospectus are under the management of an individual or a team. Frino and Gallagher (2001) find that index funds still manage to underperform their benchmark, although only slightly, by the amount of the management fees and other expenses charged by the mutual fund parent companies (Frino & Gallagher, 2001).

Similarly, the institutional dichotomous variable, which takes the value of one if a mutual fund is targeted exclusively to institutional investors, is to a certain extent a negative regressor of compensation. The institutional flag is consistent in direction and relatively consistent in magnitude across all 20 regressions, but acts erratic in terms of statistical significance. In table XII, average independent director compensation decreases when switching from a retail fund to a fund marketed to institutional investors for the OLS, robust, and White regression models ($\beta = -0.34$, $p<0.05$ to $p<0.10$). This pattern holds consistent for the robust and White models for the average director compensation of actively managed mutual funds (Table XIII), where directors of institutional funds obtain a lower salary than directors serving on boards of retail funds ($\beta = -0.25$, $p<0.10$). The effect is stronger for all but the clustered regression model in the sample of funds charging 12b-1 fees (Table XIV), with an almost half of a percent average pay-cut director salary for institutional funds ($p<0.01$ to $p<0.05$). Nonetheless, in table XVI the negative impact of institutional funds on mutual fund manager compensation is relatively stronger in statistical significance ($\beta = -0.34$, $p<0.001$ to $p<0.01$) across OLS, robust, White and clustered regression model. Part of the reason of a decrease in compensation for institutional funds might transcend from the increased scrutiny applied by institutional investors. Institutional mutual funds might not require as much due diligence from mutual fund boards because active institutional investors might increase external supervision. Adams et al. (2013), in their analysis of the impact of organizational structure on managerial turnover in a large sample of U.S. mutual funds, find that institutional holdings effectively affect all aspects of the mutual fund organizational structure, and they are linked to average lower expenses. Furthermore, institutional investor accelerate manager turnover on underperforming funds,
regardless of sponsor ownership, the kind of fund considered, or the type of management (individual or team) in place (Adams, Mansi, & Nishikawa, 2013).

The next portion of this analysis focuses on the variables that try to capture the effect of corporate governance on compensation. One of the main roles of mutual funds’ boards in the last decade has been to keep mutual funds away from litigation (Guercio, Dann, & Partch, 2003). Between 2003 and 2005 the SEC brought 24 enforcement actions against investment advisers and other financial intermediaries for mutual fund trading abuses. The fines collected in these settlements are among the agency's highest monetary penalty collections, averaging $56 million per fine compared to an average of under $20 million per fine from other settlements related to securities law violations before 2003. By the end of 2005, the collective value of the penalties obtained from these settlements surpassed $3.1 billion. Over this period, among other abuses, the SEC identifies several instances of late trading charges, and market timing. The most common crime, market timing, involves mutual funds families allowing favored customers to trade frequently violating stated mutual fund trading limits while ramping up transaction costs, which hurts the returns of other mutual fund customers. Alternatively, late trading, involves mutual fund families facilitating trades only for preferred customers at the NAV, the daily calculated mutual fund shares closing price, after new information becomes available, which provides preferred customers with substantial profits (U.S. Government Accountability Office, 2005). Most likely no other period in recent history has brought as much attention to mutual funds’ corporate governance practices as the years following the 2003 mutual fund scandals. These criminal cases are a manifestation of several abuses that are hurting mutual fund investors for a while and signal possible corporate culture or organizational problems at the core of mutual fund families. Hence, one could expect to possibly see mutual fund corporate governance influencing independent director and independent COB compensation. As I discuss below, the results on the board of directors variables of interest are quite notable, all ten corporate governance characteristics (number of independent directors, number of female directors, number of funds overseen by directors, directors fund ownership, committee meetings, COB tenure, COB age, COB
fund ownership, dual CEO/COB, and manager tenure) are almost unequivocally statistically significant regressors of independent director, independent COB, and mutual fund manager compensation, across all 20 regression models.

As mentioned earlier, board independence is a controversial topic in corporate finance. In this cross-sectional sample, the number of independent directors is a consistently negative regressor of independent director, independent COB, and manager compensation across all 20 regressions. However, the magnitude and statistical relevance of those relationships varies substantially. Board independence, for the entire sample (Table XII), is a statistically significant regressor in the OLS model and borderline significant in the robust and White regression models, with an additional independent director decreasing average director compensation by 1.1 percent (p<0.10). The impact of additional board independence on director compensation is larger for the sample of mutual funds that excludes index funds (Table XIII) and carries the highest level of statistical significance (p<0.001), with additional independent directors reducing director compensation by over four percent. Table XIV, which excludes funds without 12b-1 fees in their expense ratios, shows a large effect of additional board independence on director compensation with an average decrease in compensation brought by each additional independent director of 1.7 percent for all but the clustered regression model (p<0.10). Accordingly, in table XV, the effect remains negative while the magnitude of the coefficient is much lower for the COB compensation models (β=−0.1, p<0.001). However, in table XVI, the negative impact of board independence on mutual fund manager compensation is much broader; with an increase in the number of independent directors manager compensation decreases by 2.6 percent at the highest statistical significance level (p<0.001). Conversely, the number of female directors is also a reliable but positive regressor of independent director, independent COB, and manager compensation. It is a strong regressor of director compensation when considering the entire sample of mutual funds, table XII, across three of the four regressions, with a two percent increase in director pay accompanying every additional woman joining the board (p<0.01). In terms of magnitude and statistical significance, board gender diversity is a stronger regressor of director
compensation for the sub-sample excluding index funds (Table XIII), with a 2.12 percent increase in director compensation associated with more women on the board (p<0.001). Finally, women on the board is both strong and statistically significant regressor across OLS, robust, and White regression models for the sub-sample of mutual funds that charges 12b-1 fees, with approximately a three percent increase in average director compensation resulting from higher board gender diversity (p<0.01 to p<0.05). The number of female directors is not a meaningful or statistically significant regressor of COB compensation or of manager compensation (Tables XV and XVI). Sevick and Tufano (1997) are part of the group of pioneer researchers that look into the effect of corporate governance in the mutual fund industry. Confirming my findings, the authors report an inverse relationship between board independence and directors compensation, which also translates into lower average expense ratios. Also aligned with my results, Del Guercio et al. (2003) demonstrate a relationship between board independence, relatively low director compensation, and lower fees.

The number of funds overseen by directors has a consistently small, negative connection with independent director and manager compensation across samples and regression models. An increase in the number of funds overseen by the director for the entire sample (Table XII) is slightly indicative of a decrease in director compensation (β= -0.01, p<0.001). This pattern and the high statistical confidence holds for the sub-sample excluding index funds (Table XIII), which projects a small decrease in director compensation across all four regression models for every additional fund overseen by the board (β= -0.01, p<0.001). Table XIV shows that an analogous pattern for director compensation in the sample excluding funds that do not charge 12b-1 fees (β= -0.01, p<0.001). Similarly, the number of funds overseen by COB, table XV, has a small negative impact on COB compensation across all four regression models (β= -0.008, p<0.001). The number of funds overseen by directors has also a negligible impact on manager compensation (Table XVI) suggesting a slight decrease (β= -0.002, p<0.01). Tufano and Sevick (1997) use three different constructions of director compensation: organized by fund type, scaled by fund size, or divided by number of independent directors on the board. Unequivocally, they reach the conclusion that
the number of mutual funds overseen by the average director has a positive impact on its compensation. Alternatively, Ferris and Yan (2007) report that a combination of well-paid directors and high number of funds overseen could be lethal for mutual fund investors. This combination intensifies the funds likelihood to be involved in a financial scandal, increasing the likelihood of litigation. From the point of view of corporate governance it might be interesting to combine the idea of busy boards, in which directors oversee a large number of mutual funds, and a marginally decreasing pay as more funds are overseen by the board, both trends are observed in my sample for 2015, with the increase in litigation for funds served by directors with a higher number of funds under supervision, argued by Ferris and Yan (2007). Overextended directors, who are not necessarily receiving a commensurate pay, might be more likely to become negligent and therefore turn mutual funds into vulnerable targets for mismanagement litigation. Alternatively, it is possible that number of funds overseen is capturing the effect of sponsor size and that directors working for mutual funds belonging to larger families are receiving relatively lower pay with respect to their workload. A similar effect might be captured also by the negative effect of the number of other officers mentioned earlier.

While the number of funds overseen by the average director having a moderate negative impact on independent director compensation, might seem a bit puzzling, finding that directors fund ownership is a slightly positive regressor of compensation might prove itself more revealing. A recent article in The Wall Street Journal by Moyer (2015) prompts investors to pursue the funds that count with large number of mutual fund board members among their investors as a winning investment opportunity. This article, citing similar findings from Morningstar’s Kinnel, reveals significant differences in performance for the board-approved funds (Moyer, 2015). In my analysis, directors fund ownership is a slightly positive regressor of compensation ($\beta = 0.05$, $p<0.001$) across all four regression models in the entire cross-sectional population (Table XII). Similarly, for the sample excluding index mutual funds (Table XIII), directors fund ownership is a statistically significant regressor of director compensation for all but the clustered model ($\beta = 0.03$, $p<0.01$ or $p<0.05$). In the last realm of director compensation, from the sub-
sample that identifies mutual funds charging 12b-1 fees (Table IV), directors fund ownership is a statistically significantly and positive regressor of director compensation through all four regressions (β=0.09, p<0.001). The same way that Moyer (2015) suggests that identifying the funds picked by directors with their own money might be a path to pick well-performing funds; directors are also usually in charge of picking the highest ranked officer of the board, the chairman. Hence, as one would expect, COB fund ownership is also a significant regressor of COB compensation (β=0.28, p<0.001). In terms of the impact of board ownership on managerial compensation, directors fund ownership has little impact on manager compensation (Table XVI) carrying a small negative impact (β=-0.01, p<0.05); while COB fund ownership has no effect on manager compensation from a statistical point of view. An innovative research paper by Butler and Gurun (2012) looks at CEOs and mutual fund managers from the same educational network, which is defined as sharing an educational background. The authors provide several fascinating empirical findings. First, the authors reveal that CEOs with higher level of investments in mutual funds in which they share educational background with the mutual fund manager receive higher levels of compensation than CEOs without the same educational network or level of mutual fund investments. Furthermore, the authors detect that mutual fund managers perceive higher levels of management quality in the firms led by CEOs with whom they share the same educational background, followed by abnormal trading levels in these same firms. Although carving a slightly different arch, the authors are capable of identifying the same connection I extract from my statistical analysis: a positive connection between fund ownership and executive compensation (Butler & Gurun, 2012). Alternatively, as I present in the next section, for the cross-sectional analysis of hypothesis five, which explores the determinants of mutual fund performance, there is a positive and significant relationship between performance and board ownership, so it is possible that the higher compensation is somewhat the consequence of enhanced performance and TNA growth.

The analysis presented in this section includes the number of committee meetings as one of the variables of interest in place to explain independent director compensation. Table III, the correlation
matrix for all the variables in this cross-sectional analysis, reveals an almost perfect correlation coefficient between the number of board committees and the number of committee meetings \((r=0.92)\). I anticipate a positive relationship between the number of committees meetings and director compensation. Given the close relationship between number of committees and committee meetings, a considerable portion of a director’s salary might result from increments obtained from serving on a specific board, or due to meeting fees, included as a consequence of attending committee and regular board meetings. It is also one of the most direct approaches to measure board effort but perhaps overly simplistic. A higher number of committee meetings or committee memberships require directors to devote more time and more effort to the mutual fund. According to self-reported data from a PwC’s (2016) survey-type study, the number of mutual funds committees is presumably a direct consequence of the challenges and crucial decisions faced by the fund. In my sample, after controlling for the effect of other governance variables, I detect a positive relationship between director compensation and the number of committee meetings. However, such association is not always statistically significant. An increase in committee meetings is associated with a small increase in director compensation \((\beta=0.04, p<0.01)\) across all four regression models while employing the entire cross-sectional sample (Table XII). This pattern only holds for the clustered model of the sample excluding index funds (Table XIII), with an almost identical positive impact \((\beta=0.03, p<0.01)\). Once the attention turns into mutual fund manager compensation (Table XVI), three regression models, OLS, robust, and White, share a positive impact of committee meetings on manager compensation \((\beta=0.02, p<0.001)\). While, there is a slightly stronger positive relationship across the four regression models for the sample charging 12b-1 fees, committee meetings variable is not a significant regressor of director compensation. These results are largely consistent with the idea of higher pay following higher measurable activity or involvement.

With regards to COB characteristics the results are not so cohesive. I expected to see a positive relationship between chairman and manager tenure and their respective compensations. One should expect that if a chairperson or a mutual fund manager has kept his position for a longer period of time, it
should be because he is performing well, and thus, is being compensated accordingly. However, the relationship that emerges in these regressions between tenure and compensation is not statistically significant for either of the two roles: COBs and managers. This lack of significance might be the consequence of several factors. First, it might reflect the fact that mutual fund managers are receiving an increasing portion of their salaries as variable compensation, where the impact of longevity although still carrying a positive effect is comparatively small. It also could be capturing the fact that executives that have retain their position for longer periods of time are more likely to have a higher ownership stake in the mutual fund sponsor where they work, hence they no longer need for compensation to be the main factor ensuring interest alignment with their principal. The financial literature provides empirical evidence that suggest that CEOs with higher ownership interests in a firm tend to have lower salaries (Demsetz & Lehn, 1985; Brick, Palmon, & Wald, 2006). On the contrary, the relationship between the COB age and the COB compensation is negative and statistically significant. Such an apparent paradox suggests that the mutual fund industry does not reward COBs for experience. Across 15 of the 20 regressions, the current age of the COB has a slight negative impact on independent director and independent COB pay with varying levels of statistical resonance. For the entire sample of mutual funds (Table XII) and for the sub-sample that excludes index funds (Table XIII), COB age is a small negative regressor of director compensation for all but the clustered model (β= -0.02, p<0.01 to p<0.05). For the sample of funds sample charging 12b-1 fees (Table XIV) across all four regressions, COB age has a larger negative impact with higher statistically significance on director compensation (β= -0.06, p<0.001 to p<0.01). This same pattern holds too for the entire sample of funds dealing with COB compensation as a dependent variable (β= -0.02, p<0.001). In contrast, as shown in table XVI, COB age has a non-significant, and therefore negligible positive impact on manager compensation (β= -0.005). In regards to COB tenure, director compensation increases slightly with increases in COB tenure increases across the entire sample (Table XII), the sample excluding index funds (Table XIII), and the sample charging 12b-1 fees (Table IV) with a consistent coefficient and statistical validity across all but the clustered models (β=0.02 to β=0.04; p<0.01 to p<0.10). Similarly, in table XVI, COB tenure is still a significant, small,
and positive regressor of manager compensation for all but the clustered model ($\beta = -0.01, p<0.05$).

Finally, manager tenure is only a significant regressor of director compensation in the sample of funds charging 12b-1 fees (Table IV), across the OLS, robust, and White regression models ($\beta = 0.04, p<0.05$ to $p<0.10$). It is not a significant regressor neither across the other director compensation samples, nor across the manager or the COB compensation samples.

**Dual CEO** status is not a statistically significant regressor of independent COB or mutual fund manager compensation, but it is a marginally significant negative regressor of independent director compensation across all four regressions and three samples, at the highest statistical confidence level ($\beta = -1.15$ to $\beta = -1.34, p<0.001$). Dual CEO is a dichotomous variable, which takes the value of one if the CEO and COB roles are shared by the same executive and zero otherwise. By definition when the CEO and COB share the same role, the COB is not an independent member of the board. The importance of COB independence in the highly regulated mutual fund industry has been controversial. In the 2004 Amendment to the Investment Company Act of 1940, the SEC requires mutual funds to populate their boards with at least 75 percent of independent members and to name a non-interested chair. In 2006, shortly before the new rules were about to get implemented, the D.C. Court of Appeals repeals the request for increase mutual funds’ board independence. The SEC was required to provide evidence to justify this requirement, delivering a cost-benefit analysis to prove that it is beneficial for mutual fund customers to have independent boards. The SEC declined to provide evidence or to contest the appeal. Consequently, several researchers have attempted to identify an empirical relationship between COB independence and performance (Ferris and Yan, 2007; Linck et al., 2008; Brick and Chidambaran; 2010). The closest evidence that I could find in the mutual fund industry for a link between COB independence and compensation comes from Meschke (2007), which partly provides encouragement for my claims. He empirically proves that mutual funds led by an independent chair or overseen by highly independent boards, approve lower compensation, account for a larger number of directors among their investors, and have more at stake in terms of their reputation because of longer executive tenures (Meschke, 2007).
VI. A. iv. Hypothesis IV

Hypothesis IV:

After controlling for other influential factors identified in similar settings by the financial literature, funds with higher expense ratios tend to pay higher average salaries to their executives.

\[
\text{Dir. Comp}_i = \alpha + \beta_1 \text{Dir. Comp}_{i-1} + \beta_2 \text{Fund Characteristics}_{i-1} + \beta_3 \text{Expense Ratios}_{i-1} + e_i \quad (6)
\]

\[
\text{COB Comp}_i = \alpha + \beta_1 \text{COB Comp}_{i-1} + \beta_2 \text{Fund Characteristics}_{i-1} + \beta_3 \text{Expense Ratios}_{i-1} + e_i \quad (7)
\]

\[
\text{Mngr. Comp}_i = \alpha + \beta_1 \text{Mngr. Comp}_{i-1} + \beta_2 \text{Fund Characteristics}_{i-1} + \beta_3 \text{Expense Ratios}_{i-1} + e_i \quad (8)
\]

I expect to find similarities between the determinants of mutual fund manager compensation and the determinants of CEO compensation, as established by the financial literature. This parallelism strikes from potential agency conflicts and the existence of asymmetry of information. The problems from the far-removed agent-principal relationship between mutual fund managers and customers strikes from the prospects of moral hazard and the presence of asymmetric information (Starks, 1987). The average mutual fund investor cannot easily and inexpensively monitor how the mutual fund manager runs his portfolio, or the suitability of the resources that the manager decides to spend implementing his investment strategy. Although arguably, most investors are mainly concerned with the end results, investors cannot distinguish whether their mutual funds’ performance is the consequence of the managers’ skills or the result of favorable odds. Simultaneously, managers’ investment strategies might carry too much risk unbeknown to investors. Consequently, the board’s role consists on mainly ensuring that the mutual fund managers actively trade within the confines established by the sponsor and on mitigating the impact of the absence of costless, complete information from part of the investors.

Some of the CEO compensation literature highlights how switching to variable compensation is making executives myopic and does not completely eradicates agency problems. A similar problem
arises from the most common types of mutual funds fees, accrued as a percentage of assets and immune to performance. Since mutual fund fees are the substance of sponsor profits, it is possible that mutual funds manager compensation is tied to mutual fund families’ profits. Sponsor profits are maximized when the amount of assets under management increases regardless of the source of this growth (Golec, 2003). Independent directors approve all mutual fund fees and form the compensation committee, so they are in charge of approving management fees and all other salaries, including their own. If directors do not tie mutual fund managers compensation to the only viable indication of managers’ investment skills, i.e. portfolio performance, then one should question the role of the board as the mutual fund customers’ advocate.

Expense variables and mutual fund characteristics are run as regressors for independent director, independent COB, and manager compensation using the standard OLS, robust, White, and clustered regression models in five different settings. Between four and five mutual fund expenses are included in the statistical models: the remaining of the expense ratio after excluding management fees and 12b-1 fees, management fees (except for the regression that entails manager compensation), 12b-1 fees, brokerage fees, and the percentage of the mutual fund’s total assets that the portfolio manager keeps as cash. The models also include mutual fund characteristics as control variables to account for mutual funds’ traits that the prior financial literature finds relevant explaining variation is mutual funds’ expenses. Furthermore, five sample variations are employed to form each of these four regressions models: to further understand the relationship between director compensation and expenses, the regressions are run using the full sample, a sub-sample excluding index mutual funds, and a second sub-sample of mutual funds that charge 12b-1 fees. When the focus turns to manager and COB compensation only the entire sample is considered. Statistically significant regressors are discussed below with comparisons made across all regression models and across all sample variations.
Table XVII summarizes the regressions results for the relationship between independent director compensation and mutual fund expenses, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis four and modeled by equation (6), across four different methodologies. The regression models are very consistent with an $F=16.16$ ($p<0.001$). The Chi-Square for the White regression model is significant ($\chi^2=133.14$, $p<0.01$) indicating heteroscedasticity is present. However, there are not significant differences in the $F$, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain more than one quarter of the variation of director compensation for 2015, with an adjusted $R^2=0.28$ for the full sample. Three out of the five expense variables included have a statistically significant role in the regression model. The list of the four expense regressors, in order of their contribution to explaining the variation on director compensation, is: 12b-1 fees, management fees, brokerage fees, and the fund’s cash holdings. The intercept and all but one of the control variables are also significant; investment objective, family category, and turnover ratio are among the strongest regressors. Furthermore, the control variables are consistent with prior analyses in the financial literature focused around CEO compensation and firm value.

Table XVIII summarizes the regressions results for the relationship between independent director compensation and mutual fund expenses in the first cross-sectional sub-sample, which excludes index mutual funds for the year 2015, as discussed in my fourth hypothesis, and modeled in equation (6), across four different methodologies. In this sub-sample, free of index mutual funds, the overall model is still significant but with a lower $F$ value ($F=14.16$, $p<0.001$). The Chi-Square for the White regression model is significant ($\chi^2=91.94$, $p<0.10$) indicating heteroscedasticity is present. However, there are not significant differences in the $F$, $R^2$, or the regression standard errors from the OLS, robust, and
heteroscedasticity-consistent regression models. The percentage of the variance of director compensation explained by the linear combination of the expense ratio regressors is also technically lower (adjusted $R^2=0.27$); this muted effect could be the consequence of a smaller sample. Largely, the same independent variables remain statistically significant in this sub-sample with respect to the full sample but with significant inclusions and omissions. Still four out of the initial five expense regressors appear significant, in order of their contribution to explaining variation on director compensation, the statistically relevant explanatory variables are: 12b-1 fees, the leftover expense ratio after excluding manager fees and 12b-1 fees, management fees, and brokerage fees. Additionally, the intercept and now four control variables: investment objective, family category, fund life, and institutional flag, are also significant. The control variables are consistent with the prior analysis and the financial literature in the direction and magnitude of the relationship to director compensation.

[Insert Table XIX here]

Table XIX summarizes the regressions results for the relationship between independent director compensation and mutual fund expenses in the second cross-sectional sub-sample, which focuses on mutual funds that transfer the expense of 12b-1 fees to their investors in 2015, as discussed in hypothesis four, and modeled in equation (6), across four different statistical methodologies. This third setting has the highest F statistic ($F=20.07$, $p<0.001$) although it deals with the smallest sample size. The Chi-Square for the White regression model is not significant suggesting lack of heteroscedasticity. Furthermore, there are not significant differences in the F, $R^2$, or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. Similarly, the overall model, by the linear combination of expense factors and control variables, explains 45 percent in director compensation variance. It doubles the adjusted $R^2$ from each of the other two samples previously considered. Again, four out of the initial five expense regressors remain significant, in order of their contribution to explaining variation on director compensation the statistically relevant explanatory variables are: 12b-1 fees, the remaining expense ratio after excluding manager fees and 12b-1 fees, management fees, and brokerage fees.
commissions. Additionally, the intercept and five control variables are also significant, including:
investment objective, return, fund life, index flag, and institutional flag. Among these statistically
significant regressors, all except one of the expense regressors, the fund’s cash holdings, remain relevant
throughout all four models.

Table XX summarizes the regressions results for the relationship between independent COB
compensation and mutual fund expenses, in the entire cross-sectional sample of mutual funds for the year
2015, as discussed in hypothesis four and modeled by equation (7), across four different methodologies.
The regression models are consistent with an F=11.81 (p< 0.001). The Chi-Square for the White
regression model is not significant disregarding the presence of heteroscedasticity. Moreover, there are
not significant differences in the F, R², or the regression standard errors from the OLS, robust, and
heteroscedasticity-consistent regression models. The independent variables explain more than one third
of the variation in COB compensation for 2015, with an adjusted R²=0.37 for the full sample. Three out
of the five mutual fund expenses considered have a statistically significant role in the regression model.
The list of the four expense regressors in order of their contribution to explaining the variation on COB
compensation is: the leftover portion of the expense ratio after excluding manager fees and 12b-1 fees,
management fees, and brokerage fees. The intercept and all but one of the control variables are also
significant; the strongest factors among list of relevant control variables include: investment objective,
family category, fund life, and index flag. Furthermore, the control variables are consistent with my prior
analyses focused around the impact of corporate governance on compensation using similar variables
considered in the financial literature as discussed below.
Table XXI summarizes the regressions results for the relationship between mutual fund manager compensation and mutual fund expenses, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis four and modeled by equation (8), across four different methodologies. The regression models are consistent with an F=11.81 (p< 0.001). The Chi-Square for the White regression model is not significant disregarding the presence of heteroscedasticity. Similarly, there are not significant differences in the F, R², or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain more than one quarter of the variation in manager compensation for 2015, with an adjusted R²=0.28 for the full sample. Three out of the four expense variables included in the regression model are statistically relevant. The list of the three expense regressors in order of their contribution to explaining the variation on manager compensation is: the remaining expense ratio after excluding manager fees and 12b-1 fees, 12b-1 fees, and the fund’s cash holdings. The intercept is not statistically different from zero but four of the control variables are significant: investment objective, family category, returns, and fund life. As expected, the control variables are consistent with my prior analysis focused around the impact of corporate governance on compensation and similar variables considered in the financial literature as developed below.

The first control variable distinguishes among mutual funds’ possible investments pursuits. The investment objective variable keeps the same profile it shows in the regressions run for my third hypothesis, previously discussed, where compensation is paired against corporate governance characteristics. Only small variations are found in the coefficients, and the p-values are largely identical across models. Although investment objective maintains its negative sign, carried in the previous analyses, investment objective now emerges statistically significant throughout all 20-regression models that relate compensation and mutual funds expenses. Aforementioned, of the three investment objective categories reported by CRSP two apply to this study: domestic equity, and domestic bonds. Domestic equity is the baseline investment category in the model. In the full sample seeking to establish a
relationship between mutual fund expenses and independent director compensation, table XVII, across all four regression models, the investment objective categorical variable is statistically significant; the control group, domestic equity, has a positive relationship with director compensation ($\beta=-0.44$ to $\beta=-0.55$; $p<0.05$). For three of the four statistical models, in the sub-sample that excludes index mutual funds, table XVIII, the investment objective variable maintains the same coefficient ($\beta=-0.54$; $p<0.01$) with a slight increase in the clustered model ($\beta=-0.74$; $p<0.01$). The magnitude of the relationship between director compensation and investment objective continues to increase, as the sub-sample of funds considered gets smaller, showing the same positive link between equity funds and director compensation ($\beta=-0.64$; $p<0.05$) in the sub-sample of funds charging 12b-1 fees, table XIX. Restoring the entire sample once again, the positive link between equity funds and independent COB compensation gets even stronger (Table XX; $\beta=-0.8$; $p<0.01$). Lastly, in table XXI the relationship between investment objective and manager compensation is at its nadir in terms of magnitude and statistical validity ($\beta=-0.43$; $p<0.001$). As in the prior five tables, which relate corporate governance characteristics with compensation, the investment objective’s negative beta signals that, on average, domestic equity funds pay higher compensation than the rest of mutual funds, after controlling for other mutual funds characteristics that might explain compensation. Perhaps this suggests higher complexity or skill level associated with managing or supervising equity funds.

As established on the cross-sectional analysis of compensation and governance, to control for mutual fund performance, the increase in net asset value with respect to 2014, $\Delta$NAV, is introduced in the regression. I argued before that mutual fund performance should be at the forefront of mutual funds corporate culture. Perhaps one of the main reasons for the existence of mutual funds and for mutual fund managers in particular, beyond inexpensive diversification, is wealth creation. Hence, one should expect that, at the bare minimum, return is going to affect manager compensation. Mutual fund managers are in charge of conceiving investment strategies that are going to outperform a passive benchmark. Given the roles of COBs and independent directors as investors’ advocates, they are in charge of promoting and
protecting investor interests. Return should be on the board members’ minds when setting all mutual fund payments, which include both: approving the asset-based expenses to be accrued and ruling the compensation committee. However, as it happened in my analysis of hypothesis three, using largely a different set of variables, return is once again a non-influential factor in the determination of mutual fund manager, independent COB, or independent director compensation.

The effect of the control variable fund life, which measures in years for how long a fund has been active, is even more significant in this setting than it appears to be in the regressions dealing with the effect of corporate governance on compensation. Tables XVII and XVIII, report a small and very similar positive relationship between mutual funds’ age and director compensation at the highest statistical significance (β=0.03; p<0.001). This relationship does not remain as strong for the sample of mutual funds charging 12b-1 fees (Table XIX); fund life is only a moderately significant regressor in the standard OLS, robust, and heteroscedasticity-consistent regression models but with a magnitude of influence that is close to zero (β =0.011, p<0.10). In table XX despite the smaller sample size, there is an increase in the relationship when the focus shifts towards independent COB compensation, albeit it remains miniscule (β =0.02, p<0.05). Once again, this relationship completely flips when the analysis centers around manager compensation (Table XXI), now fund life is no longer a positive regressor of compensation but a possible deterrent of higher manager salary; fund life is only a significant regressor of manager pay in the standard OLS, robust, and heteroscedasticity-consistent regression models but with a lesser influence (β =-0.004, p<0.05). As mentioned earlier, Coles et al. (2000) provides empirical support for the claims sustained in this analysis. The concept of wages inertia, or salaries increasing through time is not new to economists; wage stagnation is usually blamed for unemployment and slow adjustments in the labor market. Keynes (1936) introduces the idea of nominal rigidity in the labor markets, prolonged periods in which salaries do not adjust to downturns. Labor markets nominal rigidity is usually caused by employee dismissal of wage reductions, resulting in labor market unbalances due to excess supply (Keynes, 1936).
Belonging to a specific family of funds proves again to be a significant determinant of compensation. The family of funds categorical variable shows strong statistical significance across the entire mutual fund sample with respect to independent director and mutual fund manager compensation. For the entire cross-sectional sample centered on director compensation for the year 2015 (Table XVII), moving from the control group family to the rest of the mutual fund families illustrates a moderate increase in average director compensation ($\beta = 0.03$, $p<0.001$ to $p<0.01$). Table XVIII, dedicated to actively traded funds, displays a small difference in the average director compensation from family control group to the other mutual fund families, at the highest statistical significant level ($\beta = 0.04$, $p<0.001$). On the contrary, statistical significance is present only in the OLS model across the four independent COB compensation regressions in table XX, where switching from the family control group to the other of the mutual fund families conveys a decrease in COB compensation ($\beta = -0.02$, $p<0.10$). As in the director compensation analysis, higher average manager compensation (Table XXI) can be found after leaving the family control group for the manager compensation regressions, at the highest statistical significance levels ($\beta = 0.011$, $p<0.001$).

As in the previous set of tables, the index fund categorical control variable is a statistically significant and negative regressor of compensation across most of the twenty statistical models. In table XVII, all regression models dealing with independent director compensation for the entire cross-sectional sample suggest that director compensation from index funds is on up to half of a percent lower than director compensation from their actively managed counterparts ($p<0.001$ to $p<0.01$). In table XIX, this pattern holds for all four regression models run on director compensation from the sample of from funds that charge 12b-1 fees, suggesting a small decrease on average director compensation for index funds ($\beta = -0.3$, $p<0.01$). Table XX reconsiders the entire sample and concentrates on COB compensation; here the absolute magnitude of the coefficient on the index flag regressor is slightly smaller, showing statistical significance on three regression models (robust, White, and clustered) and displaying lower average COB compensation for index funds ($\beta = -0.2$, $p<0.01$ to $p<0.05$). Judiciously, executive
compensation is lower for index funds in comparison to compensation from actively managed mutual funds; since index funds should require a lower tier of monitoring and supervising. Elton et al. (2008) confirm my results, demonstrating that index mutual fund expenses are significantly lower than the expenses from any type of actively managed fund. The authors provide significant evidence of risk-adjusted underperformance, net of expenses, for actively managed funds, in comparison to after expenses risk-adjusted index funds return. Elton et al. (2008) associate the recent surge in index fund popularity to the increase in investment options offered for index funds; several of these choices were only initially available to institutional investors. This explosion in index funds alternatives allows them to match passively and actively managed mutual funds in terms of risk, investment objective, or investment style with more accuracy. Elton et al. (2008) insist that the recipe for index funds success strikes from their ability to cut any of the expenses from actively managed mutual funds, by a considerable margin. They confront the choices of any investor that does not unquestionably resort to index funds (Elton, Gruber, & Blake, 2008).

Similarly, the institutional dichotomous variable is consistent in direction and relatively consistent in magnitude across all 20 regressions, and shows revived statistical significance with respect to its performance in the previous set of tables. In table XVII, covering the entire sample, the institutional categorical variable accompanies a decrease in independent director compensation, for all but the clustered model, of approximately half of a percent for directors serving on the board of institutional funds (p<0.01). For the sample of directors excluding index mutual funds (Table XVIII), the reduction on average director pay is smaller within the White regression model (β=-0.4, p<0.10) and it is almost significant in the robust regression model. The magnitude and direction of the relationship is relatively consistent for director compensation in the sample charging 12b-1 fees (Table XIX), but with much greater statistical significance. (β =-0.30, p<0.001). One possible reason for the significant increase of institutional funds’ impact on the funds that charge 12b-1 fees might be the consequence of the rarity of institutional funds that charge 12b-1 fees. In 2015 from a sample of approximately 8,000 funds, only
three percent of all institutional mutual funds charge 12b-1 fees compared to 78 percent of retail actively traded mutual funds that do. No statistical significance is noted for institutional flag as a regressor of COB or fund management compensation.

Boards of directors in any type of corporation have a fiduciary responsibility for effectively supervising the firm top executives and protecting shareholders interest, haltering any possible agency problem. Del Guercio et al. (2003) go even further to establish that for closed-end funds in particular, the role of the board is even more specific: the chairperson and directors of the board have no need to concern themselves with offering expertise, or advising the mutual fund managers on how to invest their portfolio, all the board needs to do is to keep mutual fund fees as low as possible for investors. Hence, board efficiency in the closed-end fund industry is very easy to measure, one just needs to consider the expenses approved by the board and that are charged by mutual funds families to investors (Guercio, Dann, & Partch, 2003). It would make sense then to tie director compensation to expenses and to expect an inverse relationship between the two; since all most mutual fund investors want from the mutual fund manager is to grow the money they invest in the fund, at a fair rate, based on their risk tolerance. However, as Chevalier and Ellison (1997) remind us, agency conflicts in the mutual fund industry are like a genetic disorder, they affect the industry by design. Furthermore, one can add the shadow of information asymmetry to aggravate agency concerns. The information mutual fund managers convey to execute their investment strategies is almost by definition secret and how they execute their trades is not directly observable by mutual fund investors. Alternatively, mutual fund families, are motivated by the interests of their own shareholders, and want their own profits to grow. Mutual fund family profits are the product of mutual fund fees, at the exact opposite side of the spectrum from mutual fund customer returns, which are computed net of mutual fund fees. As a result, the same actions that maximize mutual fund families’ net income are in direct conflict with the actions that maximize mutual fund investors’ risk-adjusted return (Chevalier & Ellison, 1997). Hence, on one side there is the connection between board compensation and mutual fund expenses, and alternatively, the relationship between mutual fund manager
compensation and expenses, both approved by the board. The results on the variables of interest are quite robust; almost in any of the twenty regression considered in this analysis at least four of the five expenses considered emerge as a statistically significant factors in connection with independent director, independent COB, and mutual fund manager compensation, across all four regression models.

Most cited expense ratios components account for: investment, management, distribution, administrative costs, 12b-1 fees, and other marketing expenses. Although expense ratios do not include all the customers’ costs associated with purchasing or owning a mutual fund; expense ratios are most likely the most widely recognized expense associated with mutual fund investment. This analysis dissects expense ratios in three parts: management commissions, 12b-1 fees, and the leftover cost of conducting business for the mutual fund after the expense ratio has been stripped of management commissions and 12b-1 fees. The first variable considered for the analysis is this last remnant of the expense ratio distilled of management commissions and 12b-1 fees. The remaining portion of the expense ratio, as an expense variable of interest, is inconsistent in magnitude and significance across the 20 regressions. For the entire sample of mutual funds (Table XVII), the remaining portion of the expense ratio is not a significant regressor of independent director compensation. However, the leftover expense ratio is a significant regressor of director compensation with the robust and White regression models for the sample excluding index mutual funds (Table XVIII), suggesting a substantial negative relation between the censored expense ratio and director compensation ($\beta = -1.35$, $p<0.001$ to $p<0.01$). This relationship is above par with a one percent increase in the leftover expense ratio accompanying a 1.35 percent reduction in director compensation. Similarly, although smaller in absolute magnitude, the remaining portion of the expense ratio is still a consistent and statistically significant regressor of director compensation across three of the regression models for the sample of mutual funds charging 12b-1 fees ($\beta = -0.66$; $p<0.05$). The effect is no longer above par, a one percent increase in the reduced expense ratio carries a 0.66 percent reduction in director compensation (Table XIX). Conversely, when considering the entire cross-sectional sample of mutual funds again, the leftover expense ratio has a higher absolute value and the
highest statistical significance as a regressor of independent COB compensation ($\beta = -2.4$, $p<0.001$). In table XX, a one percent increase in the remaining portion of expense ratio is associated with a multiplicative 2.4 percent reduction in chairman compensation. Finally, in table XXI, expense ratio is also a significant negative regressor of fund manager compensation ($\beta = -0.76$, $p<0.001$) with a slightly more muted impact in the clustered model ($\beta = -0.64$, $p<0.001$). Tufano and Sevick (1997) in many ways the precursors of this research paper, present slight evidence that contradicts my findings by hinting towards boards with relatively higher pay approving relatively higher fees. Against my initial intuition, the evidence presented in my analysis results suggests that the social contract between mutual fund boards and mutual fund customers actually works, and that higher salaries incentivize independent directors and independent COBs to approve lower expense ratios. Further aligning with my results, Ferris and Yan (2007) find a positive and consistent relationship between independent director compensation and all the components of expense ratios using three alternative measures of fund fees.

Mutual fund managers’ compensation, contained in management fees, is paid to mutual fund managers in exchange for researching and implementing optimal strategies to run the investment portfolio preferably generating a sustained risk-adjusted return. **Management fees** are accrued as a percentage of the fund’s total net assets. Since the 1970s the majority of mutual funds sponsors preferred asset-based management fees instead of performance-based commissions. Although not necessarily called performance-based, according to a recent study of management fees, over 95 percent of a sample of 5,000 in 2011 funds report paying their portfolio managers variable bonus-type compensation on top of their fixed salary (Ma, Tang, & Gómez, 2015). As far as the behavior of management fees in this study, management fees are inversely related to independent board compensation. The coefficients remain relatively close albeit the statistical significance behaves more inconsistently. The same pattern holds for all three mutual fund samples dedicated to the study of director compensation (Tables XVII, XVIII, and XIX), with a one percent increase in management fees associated to reduction in director pay of 27 basis points on average ($\beta =-0.26$ to $-0.28$, $p<0.001$ to $p<0.10$). Across the full sample employed to derive the
COB compensation (Table XX), management fees are negatively linked with COB compensation across all four regression models with varying coefficients and statistical significance levels ($\beta = -0.37$ to $-0.42$, $p<0.01$ to $p<0.10$). Meschke (2007) largely provides substantial support for my findings; the author presents a clear positive relationship between above-median compensation and lower expense ratios, which in turn translates into above-median performance for the same funds.

Introduced in the 1970s initially, Rule 12b-1 is approved with good intentions, it is supposed to help increase the penetration of mutual funds among Americans, to facilitate savings, and contribute to retirements. Rule 12b-1 allows mutual funds to take a percentage of their investors’ assets to cover the expenses of marketing the fund. The mutual fund industry markets 12b-1 fees to investors as a savings mechanism: by attracting new investors, existing investors would benefit from economies of scale that would be passed down to everyone. Walsh (2004), in a study commissioned by the SEC, reveals that the 12b-1 rule succeeds in its original intent of growing mutual funds through marketing efforts, however, mutual fund investors allocating their money to funds charging 12b-1 fees are not experiencing any of the promised benefits associated with 12b-1 fees, such as lower fees or a reduction in flow volatility. Walsh (2004) is one more of the numerous researchers, several of them previously mentioned in this paper, that describe 12b-1 fees as a net expense to mutual fund investors with no clear benefits. Hence, the relationship between compensation and 12b-1 fees strikes as particularly revealing. The weight and significance of the 12b-1 fee variable vary from sample to sample and across regression models. In the full sample of mutual funds, a decrease in 12b-1 fees is linked with an increase in independent director compensation for the entire sample across all but the clustered regression model ($\beta = -1.06$, $p<0.10$). The effect captured by table XVII reveals an above par effect, with a one percent increase in 12b-1 expenses accompanying a 1.05 percent decrease in director compensation. However, 12b-1 fees are even a stronger positive regressor of director compensation in the sub-sample excluding index mutual funds (Table XVIII), with three of the models reaching the highest statistical significance ($\beta = -3.18$, $p<0.001$) and the clustered model demonstrating still high statistical confidence in this regressor ($\beta = -3.0$, $p<0.01$). The
effect of 12b-1 fees on compensation triples in this sample, with an increase of one percent in 12b-1 fees decreasing director compensation by three times as much. A similar effect is captured in the sub-sample of funds charging 12b-1 fees (Table XIX); here the expense variable, 12b-1 fee, is again a strong regressor of a decrease in director compensation ($\beta = -1.77$, $p<0.001$). Finally, 12b-1 fees have a small positive impact on fund manager compensation (Table XXI) across all but the clustered regression model, almost reaching statistical significance at the one percent level ($\beta = 0.32$, $p<0.05$), and are not a significant regressor of independent COB compensation. The combined results suggest that better paid directors are doing a better job keeping 12b-1 fees low and ensuring value for mutual fund customers. On the contrary, mutual fund managers benefit from 12b-1 fees, albeit perhaps indirectly; Walsh (2004) documents the power of 12b-1 fees to attract more investors to the mutual funds and more investors usually mean higher TNA, which would cause management fees and management compensation to rise. A couple of recent articles also offer support for my findings. Coles’ et al. (2000) results, obtained from a sample of closed-end funds (CEF), offer evidence of a positive relationship between manager marginal compensation and above average expenses. Suggesting a positive relationship between 12b-1 commissions and manager compensation. Their results are especially significant for equity funds while they reverse for CEFs invested in bonds. Also in unison with my results, Ferris and Yan (2007) find a similar effect of 12b-1 fees on board compensation. The authors use three alternative measures for expense ratios. The main two measurements are: the expense ratio as reported in the prospectus and what they call the fund's operating expense ratio, which is defined as the fund's expense ratio net of 12b-1 fees. The impact of compensation on the expense ratio including the 12b-1 fees is twice as large as the impact of the operating expense ratio, suggesting that the role of 12b-1 fees on director compensation is largely significant.

One of the strongest motivations of this dissertation is the analysis of brokerage fees. Brokerage fees are one of the transaction costs incurred by mutual funds as a result of conducting trades on securities either with the intent of outperforming a benchmark, hedging a position, or adjusting the portfolio to
replicate an index. Brokerage fees are not one of the mutual fund expenses that require approval by the board of directors. Directors are not legally required to minimize brokerage fees as a mean to defend investors’ interests. Mutual fund managers are in charge of brokerage expenses and not even they are required to minimize brokerage commissions. They can pick a non-competitive price for transacting in exchange for research services. Since trades within the mutual fund are not conducted as mere transactions that mechanically need to be matched with the lowest possible bid, there is room for brokerage fees to reflect something else about the internal culture of mutual funds or the level of alignment between managers and the interests of mutual funds investors. In my analysis, brokerage fees are a statistically significant regressor for 16 of the 20 regressions with fund manager compensation being the only dependent variable that is not significantly affected by brokerage fees. Surprisingly, these regressions capture commonalities between brokerage commissions and board compensation, although independent COBs and directors are most likely complete detached from any decision regarding brokerage fees. In table XVII, an increase in brokerage fees is associated with a decrease in independent director compensation for the entire sample across all four-regression models ($\beta = -0.11, p<0.01$). In the sub-sample excluding passively managed mutual funds (Table XVIII), brokerage commissions predict roughly the same decrease in director compensation ($\beta = -0.12$ to $\beta = -0.14, p<0.001$). In table XIX, the impact of brokerage fees on director compensation remains negative but it is slightly muted for the sample charging 12b-1 fees ($\beta = -0.08, p<0.05$ to $p<0.10$). Finally, from table XX, the impact is slightly higher than the one experienced in director compensation when the regression focus turns to COB compensation ($\beta = -0.14, p<0.01$). If brokerage commissions are completely removed from the board and unrelated to mutual fund efficiency, or how the mutual fund is run, then one would not expect to have a consistent association between the selection of the type of brokerage firm used and the board compensation. Although caution is always required when analyzing any of the results drawn from several regressions trained to shed light on the relationship of potentially unrelated variables, it is possible also that behind all this consistency there might be several core governance principles that are influencing the choice of a specific broker. However, Deli (2002) finds empirical evidence that partly contradicts my
results, using turnover instead of brokerage fees, the author is capable of capturing the positive relationship between management compensation and portfolio turnover, which I expect to appear between brokerage commissions and manager compensation. Butler and Gurun (2012) also find a similar relationship between abnormal trading intensity and CEO compensation.

Mutual funds calculate the expense ratio on the total net assets invested in the mutual fund, which also includes the portion of the fund that is not actually invested but is kept in the fund in the form of cash. So mutual funds also charge investors to hold their money even when that money is not being put to a profitable use. In 2015, the average mutual fund, from a sample of almost 8,000 funds in the U.S., kept approximately 3.5 of its portfolio in cash, up by 20 basis points from the prior year. Investors still pay the average percent expense ratio of 1.27 percent on for these non-investments. According to the ICI, the penetration of mutual funds in the U.S reaches to about 50 percent of households with an accumulated value of $15.7 trillion by year-end in 2015. The commissions paid in this idle cash represent a net loss of seven billions for mutual fund investors, which they paid in exchange for no services. In my analysis, table XVII exposes that the percentage of cash is a relatively small, negative regressor of director compensation for the entire sample ($\beta = -0.09$, $p<0.05$) for all but the clustered model. Furthermore, in table XXI, the percentage held in cash is a positive regressor for fund manager compensation ($\beta = 0.05$; $p<0.01$). It remains a statistically not significant regressor of independent COB compensation in the entire sample and of independent director compensation for the two sub samples (mutual funds excluding index funds and charging 12b-1 fees, respectively). Yan’s (2006) extended analysis, of the determinants and implications of mutual fund cash holdings, offers support for my findings. The author finds that equity mutual funds need to keep part of the portfolio in cash to satisfy multiple purposes: cover redemptions, make dividends and capital distribution payments, take advantage of future investment opportunities but also to satisfy the payment of mutual fund expenses including salaries and management fees. Hence, there is an intrinsically negative relationship between the amount of cash a mutual fund holds and the salaries it has to pay.
VI. A. v. Cross-sectional Data Hypothesis V

Hypothesis V:

In testing my fifth hypothesis, that posits: poor mutual fund performance could be linked to higher fees such as brokerage commissions or generous executive compensation, I run four regression models on three alternative samples, after considering the effect of other possible influential factors.

\[ \text{Performance}_{it} = \alpha + \beta_1\text{Comp}_{it} + \beta_2\text{Expenses}_{it} + \beta_3\text{FundCharact}_{it} + \beta_4\text{CorpGovern}_{it} + e_{it} \quad (9) \]

Four different regressions on mutual fund return are performed on my entire cross-sectional sample, and two sub-samples: the first one excluding index funds, and the second one focusing on mutual funds charging 12b-1 fees. The four regression models start with a standard OLS regression, followed by a robust estimation of the coefficients and the standard errors against outliers and leverage points and appears as ‘Robust’ on tables XVI- XVIII; while the third one focuses on robust estimation of the residuals when heteroscedasticity concerns are present, referred as ‘White’ on the tables, and lastly, a final regression with errors clustered with respect to family membership is also run on all three samples, and it is labeled as ‘Clustered’ on tables XVI- XVIII.

[Insert Table XXII here]

Table XXII summarizes the regression results for the relationship between mutual fund performance and mutual fund traits, board of directors characteristics, and mutual fund expenses including brokerage commissions, manager and board compensation, in the entire cross-sectional sample of mutual funds for the year 2015, as discussed in hypothesis five and modeled by equation (9), across four different methodologies. The regressors measuring corporate governance, manager and director compensation, brokerage fees, and control variables are significantly associated with the variance in
mutual fund performance (F=10.39, p<0.001). The Chi-Square for the White regression model is significant ($\chi^2=245.02$, p<0.05), indicating heteroscedasticity is present. However, there are not significant differences in the F, R², or the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models. The independent variables explain almost one quarter (22 percent) of the variance in mutual fund returns (adjusted R²=0.22). Five of the eight corporate governance variables of interest have statistically significant roles in the regression model. The list of the five corporate governance regressors in order of their contribution to explaining the variation on mutual fund returns is: dual CEO/COB status, number of committees, independent director fund ownership, manager tenure, and COB tenure. Four of the five expense variables included have a statistically significant role in the regression model. The list of the four expense regressors in order of their contribution to explaining variation on performance is: 12b-1 fees, cash holdings, the leftover portion of expense ratio after excluding management fees and 12b-1 fees, and management fees. The intercept is not significant, however, five additional control variables are, including: investment objective, institutional flag, index flag, family category, and fund life. Furthermore, all control variables are consistent with the prior literature in the direction and magnitude of their relationship with mutual fund performance; even when they are not significant the control variables exhibit a beta that is logical given what is known in regards to how mutual funds operate.

[Insert Table XXIII here]

Table XXIII summarizes the regression results for the relationship between mutual fund performance and mutual fund traits, board characteristics, and mutual fund expenses including brokerage commissions, manager and board compensation in the first cross-sectional sub-sample, which excludes index mutual funds, for the year 2015, as discussed in my fifth hypothesis, and modeled in equation (9), across four different methodologies. The regression models are significantly predictive of the variance in mutual fund performance and very consistent with an F=11.23 (p<0.001). The Chi-Square for the White
regression model is not significant indicating the sample is homoscedastic. The F, $R^2$, and the regression standard errors from the OLS, robust, and heteroscedasticity-consistent regression models remain largely stable. Again, the independent variables explain almost one quarter (24 percent) of the variance in performance (adjusted $R^2=0.24$). Now seven of the eight corporate governance variables of interest have statistically significant roles in the regression model. The list of the seven corporate governance regressors in order of their contribution to explaining variation on mutual fund returns is: board independence, dual CEO/COB status, number of committees, number of directors, independent directors fund ownership, manager tenure, and COB tenure. Once more, four of the five expense variables included have a statistically significant role in the regression model. The list of the four expense regressors in order of their contribution to explaining variation on performance is: cash balances, 12b-1 fees, the leftover portion of expense ratio after excluding management fees and 12b-1 fees, and management fees. The intercept is mostly not significant, however, three additional control variables are significant: investment objective, fund life, and family membership. Statistically significant regressors are discussed below with comparisons made across all four regression models.

[Insert Table XXIV here]

Table XXIV summarizes the regressions results for the relationship between mutual fund return and corporate governance characteristics, and mutual fund expenses including brokerage commissions, manager and board compensation in the second cross-sectional sub-sample, which excludes mutual funds that do not charge 12b-1 fees, for the year 2015, as discussed in my fifth hypothesis, and modeled in equation (9), across four different methodologies. In this sub-sample, with mutual funds that charge 12b-1 fees, the regression models consistent with an $F= 5.04$ ($p<0.001$). The Chi-Square for the White regression model is not significant indicating the sample is homoscedastic. The F, $R^2$, and regression standard errors are also consistent across the OLS, robust, and heteroscedasticity-consistent regression models. As the sample size is lower, the independent variables explain less than 15 percent of the variance in performance (adjusted $R^2=0.14$). Half of the eight board of directors variables of interest have
statistically significant roles in the regression model. The list of the four corporate governance regressors in order of their contribution to explaining variation on mutual fund returns is: dual CEO/COB status, number of committees, independent directors fund ownership, and COB tenure. Still four of the five expense variables included have a statistically significant role in the regression model, albeit at varying confidence levels. The list of the four expense regressors in order of their contribution to explaining variation on performance is: cash balances, management fees, the leftover portion of expense ratio after excluding management fees and 12b-1 fees, and for the first time, brokerage commissions. The intercept is not significant, however, now four more control variables are significant (in order of the absolute value of their coefficients): investment objective, institutional flag, family membership, and fund life. Statistically significant regressors are discussed just below with comparisons made across all four regression models from the three cross-sectional samples.

As noted in hypothesis I through IV, the investment objective is a categorical variable equipped with three investment objective groups as reported by the CRSP mutual fund dataset: domestic equity, international equity, and bonds. The categorical variable included in this model reflects these funds’ investment objectives, which represent what is known as asset allocation. Asset allocation refers to the placement of the portfolio’s fund across large investment categories, mainly equity, debt, and money markets. This decision precedes the selection of individual securities such as specific stocks or bonds. In my model, domestic equity is introduced as the baseline investment category in the model. Across all four models, investment objective is statistically significant and the control group, domestic equity, has a positive association with performance (p<0.001). In table XXII, for three of the four models measured against the full sample of funds, the investment objective variable has the same coefficient (β=-0.69), with a slightly higher magnitude in the clustered regression (β=-0.72, p<0.001). Therefore, funds vested in bonds see approximately a 0.7 percent decrease in performance relative to those investing in equity. The relationship is similar, for the sample excluding index mutual funds (Table XXIII) with a slightly larger magnitude (β=-0.76- β=-0.80, p<0.001); and for the sample of mutual funds charging 12b-1 fees
(Table XXIV) with a significantly smaller magnitude (β=-0.50, p<0.001). Therefore, equity mutual fund customers in this sample experience approximately a 0.8 percent decrease in performance when switching to mutual funds investing in domestic bonds, and customers from mutual funds charging 12b-1 fees see a half of a percent decrease in performance when venturing into funds invested in or bonds.

It is clear that performance is largely not affected by the size of the mutual fund as measured by total net assets, TNA. Except for the results reflected in table XXIV, which pertain to the sub-sample of funds that accrue 12b-1 fees, TNA appears with a persistent negative sign and almost identical coefficients through the eight models that are tested in the full sample and the sub-sample that focused on actively managed funds (β=-0.020 and β=-0.026). In fact, although of opposite sign, the statistically non-significant coefficients remain largely unchanged for three out of the four models, in the sample of mutual funds that charge 12b-1 fees (β=0.026). The financial literature portrays this relationship in many occasions in the past with varying degrees of statistical success and, as it happens in my tables, with mixed results. In the camp that shows a negative relationship, Jensen (1993), Edelen et al. (2002), Prather et al. (2004), Chen et al. (2004) and more recently Bhojraj et al. (2012) connect larger funds to lower mutual fund performance. Consequently, Prather et al. (2004) and Berk and Green (2004) offer a very similar reason for the negative returns associated with increases in TNA. Positive past returns attract additional investors until the mutual funds reach a certain size and they cannot longer pursue the same investment objectives that made them successful in the first place. In terms of suggesting a positive association between TNA and performance, multiple authors have fund economies of scale as a possible fee reduction force in mutual fund expense ratios (Malhotra and MacLeod, 1997; Tufano and Sevick, 1997; Walsh, 2004; Adams et al., 2012; Iannotta and Navone, 2012; Malkiel, 2013). Furthermore, direct evidence of a negative link between asset size and performance are found in Haslem et al. (2008) and more recently in Elton et al. (2012). Finally, with similarities to the results derived in my analysis, Carhart (1997) and Kinnel (2010) find no significant relationship between asset size and performance.
Fund life, as a control variable, is a small positive, statistically significant regressor of performance in the full sample (Table XXII) and the sample excluding index funds (Table XXIII) at the highest significance levels. For every additional year that the fund remains in operation, performance increases across all four regression models in the full sample (β=0.34, p<0.001). Similarly, table XXIII, zeroes in on in the sample excluding the index funds, reflects that there is a negligible increase in performance with every additional year in the funds’ age (β=0.04, p<0.001 to p<0.01). This relationship does not hold true for the sample of mutual funds charging 12b-1 fees, fund life is only a significant regressor in the clustered model but with a magnitude of influence that is even closer to zero (β =0.011, p<0.10). Carhart’s (1997) classical financial paper is set to discern the origins of superior performance among mutual funds, while igniting the debate around persistence in the industry. Among his early discoveries, the author determines that age, size, or fees are not defining factors in the conquest to explain large spread in performance. However, I believe his findings might align with mine because although there are not discernable differences in fund age for funds in the in the top and bottom decile. There is a steady increase in funds age going from the worst performers to the middle decile. Further, average mutual fund age for the group of highest performers but remains higher than the average fund life in the group of worst performers. The author makes a case for performance persistence, which also reinforces the idea that fund life is related to performance. According to the author poor performance tends to linger for as long as five years (Carhart, 1997).

Family membership enters the regression models as a categorical control variable. Family membership (β=0.04) is a significant factor across all three regression models for the full sample (Table XXII) and for the sample excluding index mutual funds (Table XXIII), its statistical significance varies widely (p<0.001 to p<0.1). This relationship and the impact of family membership onto performance are dramatically muted for the sample of mutual funds charging 12b-1 fees (β=0.02,) and the confidence level is consistent but somewhat lower (p<0.001 to p<0.05). Customers invested in the mutual funds from the family control group in the full sample and in the sub-samples, experience, on average, lower
performance. Interestingly, as a categorical control variable, institutional flag is only a significant positive regressor of performance in the robust and White regression models ($\beta=0.3$, $p<0.05$) in the full sample (Table XXII). While the magnitude and direction of the relationship is comparable in the OLS and clustered regression models, the regression coefficients are not statistically significant (Table XXII). It is not a significant regressor of performance across any of the four regression models for the sample excluding index mutual funds (Table XXIII); however, institutional flag is again a significant regressor of performance in the robust, White, and clustered regression models ($\beta=0.35$, $p<0.05$ to $p<0.10$) in the sample of mutual funds charging 12b-1 fees (Table XXIV). Institutional investments have captivated the attention of the financial literature. Part of the focus has been on the effects that institutional ownership has in equity prices and investors flows. Edelen and Wagner (2001) decide to verify if the impact that institutional trades have on stock prices would translate to the trading of aggregate investment vehicles, such as mutual funds. As it is suggested by my analysis, they also share a positive and statistically significant relationship between institutional trades and aggregate daily flow, with a collateral effect on returns for U.S. equity funds. Their findings are derived from a smaller sample of approximately 420 U.S. equity funds over two consecutive years, 1998-1999 (Edelen & Warner, 2001). Further evidence in favor of my findings appears also in a study by Christoffersen (2001). She identifies superior performance for institutional money market mutual funds, MMMF, compared to their retail counterparts. Christoffersen (2001) traces this superior performance not to superior investment strategies but to the willingness of most managers to waive management fees in institutional MMMF, an occurrence that is not common in retail MMMF. She finds a significant difference in the likelihood of fee adjustments if the end beneficiary is an institutional investor. Given the competitive environment for MMMF, small fee waivers are ultimately responsible for performance differences between retail and institutional funds (Christoffersen, 2001).

The dichotomous variable that identifies index mutual funds in the full sample is positively linked with performance (Table XXII) across all four regressions with similar magnitude for the OLS,
robust, and White models ($\beta=0.18$) but varying confidence levels ($p<0.01$ to $p<0.05$). The magnitude of the index flag coefficient for the clustered model is higher ($\beta=0.27$, $p<0.05$). According to the regressions performed in this analysis, investors in passively managed index mutual fund enjoy higher average returns relative to those invested in actively managed funds. Several studies have shown the hegemony of passive management strategies against the skill of professional portfolio managers behind active investment, corroborating my results. According to the Morningstar Direct database for 2014, across almost 8,000 mutual funds, the average expense ratio for actively managed funds is 1.38 percent compared to 1 percent for the index funds, this directly translates into a 38-basis points reduction in performance. Other authors have attempted to quantify the costs of active management, from the 67 basis points proposed by French (2008) to over seven percent according to Miller (2007) and Smith (2014). In my analysis, the categorical index fund variable loses its significance in the models run against the sub-sample of mutual funds that do charge 12b-1 fees to their investors (Table XXIV). Behind the lack of significance of the index flag among the mutual funds changing 12b-1 fees is probably the fact that only a small proportion of index funds get away with charging 12b-1 fees, and that most index funds derive their competitive advantage from charging lower fees. In the 2014 Morningstar Direct mutual fund report 62 percent of index mutual funds charged 12b-1 fees compared to 78 percent of actively managed funds. Index mutual funds innate popularity does not require extensive marketing campaigns, moreover, one of their most sought after attributes derives from the fact that index mutual funds tend to have lower expense ratios in general (Ashford, 2015).

As a regressor of mutual fund performance, manager tenure is only marginally significant across the 12 regressions. It emerges as a significant positive regressor of performance in the full sample (Table XXII) for the standard OLS regression ($\beta=0.02$, $p<0.05$) but not in the other three statistical models. This relationship is similar in the sample excluding the index mutual funds (Table XXIII); again manager tenure in the standard OLS model is a significant indicator of performance with a slightly larger
magnitude, albeit, the same statistical significance level ($\beta=0.03$, $p<0.05$) and is not a significant regressor in the other three statistical models. Finally, manager tenure is not a significant regressor of performance in the sample of mutual funds charging 12b-1 fees (Table XXIV). Several studies confirm the timid relationship that appears to exist within the confines of, only of the simplest statistical models in, my analyses. First, Golec (1996) also considers the relationship between mutual fund fees, performance, and risk. Using three simultaneous equations, he finds that managers’ tenure, but not the managers’ age, has a positive impact on the performance of the funds he controls. Second and more recently, Porter and Trifts (2014) and Berk and van Binsbergen (2015), also find manager tenure to cause a positive impact on mutual funds performance. Berk and van Binsbergen’s (2015) model is set to demonstrate how mutual fund managers’ skills might be responsible for persistent differences in mutual funds return. They find that differences in managers’ skills remain for as long as a decade and that skill differences are amplified by the manager’s tenure in a mutual fund, with substantial increases in skill over time (Berk & Binsbergen, 2015).

Inevitably, the relationship between the expense ratio, excluding management commissions and 12b-1 fees, and mutual fund performance is negative, albeit it stands at varying confidence levels. The lower the expense ratio, the higher performance for the full sample (Table XXII) across three of the four regression models ($\beta=-0.48$). However, this modified expense ratio is not a significant regression coefficient in the clustered regression model for the full sample (Table XXII). Similarly, lower remaining expense ratios are associated with higher performance in the sample excluding index mutual funds ($\beta=-0.52$, $p<0.05$) for the standard OLS, robust, and white regression models, but once again not for the clustered regression model. Curiously, though for the sample of mutual funds charging 12b-1 fees, a lower net expense ratio is significantly connected with higher performance for just the clustered regression model ($\beta=-0.30$, $p<0.10$). Although, this association is not significant across all models and samples, throughout all twelve regressions, the magnitude and the direction of the relationship are similar.
with an increasing expense ratio accompanying a decrease in performance. For the full sample (Table XXII) and the sub-sample excluding index mutual funds (Table XXIII), an increase of one percent in the remainder of expense ratio is significantly linked to a decrease in performance of approximately half of a percent according to the standard OLS estimation (p<0.05), the robust model (p<0.10), and the White regression (p<0.10). In all cases, the leftover expense ratio has a performance reduction effect. Edelen et al. (2007) captured a similar phenomenon; the authors share an above par effect of residual commissions, scaled by TNA, on mutual fund performance. The residual portion of fund commissions distils several of same components that remain in the expense ratio after it has been stripped of management costs and 12b-1 fees. Carhart (1997), which focuses on persistence in mutual fund performance, also finds an above par negative effect of expense ratios on performance. Although the magnitude of the effect is not quantified, Kinnel’s works, both in 2010 and 2014, follow the relationship between performance and expense ratios through a combined period of five years starting in 2005. The author shares that, especially during the Great Recession, the mutual funds that are most likely to survive are the ones that at the lowest range of the expense ratio continuum. He believes that the easiest explanation for the low mortality rates among funds with low expense ratio can be found in their proclivity to outperform all other funds. Against all odds, low expense ratio is the best predictor future positive abnormal returns; it outperforms manager turnover, overall riskiness, or the asset size or even the Morningstar ratings (Kinnel, 2010; Kinnel, 2014).

There are similarities in the way statistical significance emerges for specific samples and regression models for the aforementioned leftover expense ratio and management fees below. Lower management commissions are also associated with higher performance for the full sample (Table XXII) in the standard OLS regression (p<0.05) and the White regression model although only marginally significant, coming short of the 90 percent confidence level by only one percent. Manager commissions in the standard OLS model statistical significance is also at one percent of reaching the next confidence level (β=-0.45, p<0.05). In the Table XXIII for sample excluding index mutual funds, lower management commissions accompany higher performance across three of the four regression models, OLS, robust, and
White, ($\beta=-0.50$, $p<0.05$ to $p<0.10$) but not in the clustered regression model. The inverse outcomes are found for the sub-sample of mutual funds charging 12b-1 fees with only the clustered model finding management fees to be significantly associated with performance ($\beta=-0.39$, $p<0.05$). Once again, as it happened with the leftover portion of the expense ratio, as management fees increase by one percent, performance significantly decreases by approximately half of a percent only in the OLS regression model ($p<0.05$, albeit closer to $p<0.01$) and just marginally in the White heteroscedastic-consistent error model (close to $p<0.10$). This relationship is slightly stronger across three regression models in the sub-sample excluding index mutual funds with a decrease in mutual fund return of half of a percent for each one percent increase in management fees at varying degrees of confidence levels in the OLS ($p<0.05$), robust ($p<0.10$), and White ($p<0.10$) regression models (Table XXIII). Inversely, in the sub-sample of mutual funds amassing 12b-1 fees (Table XXIV), an increase of one percent in the management fees is significantly linked to a 0.4 percent decrease in performance in the clustered regression model ($p<0.05$).

The relationship between management fees and mutual fund performance has also been explored in the financial literature. First, Golec (1996) initially contradicts my results. According to his findings, mutual funds’ administrative expenses negatively affect performance but a reverse relationship is observed with respect to management fees. From the author point of view, high management fees reward superior investment skills, which in return provide superior performance. Later on, the Golec’s findings align with my when he observes the changes in mutual fund performance and expense ratios caused by changes in regulation, around 1970, that indirectly incentivized the adoption of asset-based commissions and the demise of performance-based fees. Golec (2003) finds asset-based fees, which are mostly spent in management compensation and marketing, erode mutual fund performance and misalign the interests of mutual funds’ investors and managers. Adams et al. (2012) questions the fairness of management commissions, echoing a 2010 Supreme Court decision related to Jones versus Harris Associates case. Although the authors do not specifically explore management fees, their findings align with mine in a sense, since they verify an inverse relationship between the magnitude of management fees and the
quality of corporate governance in mutual funds (Adams, Mansi, & Nishikawa, 2012). Malkiel (2013) finds that while management fees continue to escalate, the trend observed in most mutual fund investors’ returns is of continuous deterioration. His conclusions marry my findings because he finds increases in management fees are not parallel to superior performance of actively managed funds or superior market efficiency (Malkiel, 2013).

For the full sample (Table XXII), the **12b-1 fees** have a negative connection with performance across all four regression models with variable degrees of statistical strength (p<0.01 - p<0.10). The 12b-1 fees has a similar negative impact on performance but with a lower significance level (p<0.10) across three of the regression models, standard OLS, robust, and White, for the sample excluding index mutual funds and they are not a significant regressor for the clustered regression model in the sample excluding index mutual funds (Table XXIII) nor are they a significant regressor of performance across all four regression models for the sample charging 12b-1 fees (Table XXIV). Table XXII reflects how performance increase by 1.47 percent for each one percent decrease in the 12b-1 fees across three of the regression models (OLS, robust, and White) in the full sample (p<0.01 to p<0.05). Similarly, performance increases 1.44 percent for each one percent decrease in 12b-1 fees in the sample excluding index mutual funds across three of the four regression models (OLS, robust, and White) but with a significance of just ten percent (Table XXIII). This relationship is somewhat attenuated for the clustered regression model in the full sample as performance significantly (p<0.10) increases only 1.15 percent for each one percent decrease in 12b-1 fees (Table XXII) and is not statistically significant in the clustered regression model in the sample excluding index mutual funds (Table XXIII). As might be expected, the 12b-1 expense variable is not a statistically significant regressor of performance across the four models in the sample of mutual funds that charge 12b-1 fees. Ferris and Chance (1987) and, a decade later, Malhotra and McLeod (1997) are among the pioneers to study 12b-1 fees. Against the lobbyists’ arguments portraying 12b-1 fees as a cost reduction mechanism, both sets of authors’ findings reveal that 12b-1 fees are a net expense to investors. More recently, Walsh (2004) and Freeman (2007) share that
12b-1 charges only benefit mutual fund sponsors by increasing the asset size of most mutual funds that employ them. As it has been reflected also in my findings, the marketing expense has resulted in a net decrease in performance for mutual fund customers.

For two out of the three pools of mutual funds considered, the entire sample (Table XXII) and the sub-sample of actively managed mutual funds (Table XXIII), brokerage fees are not a significant hindrance to performance. However, focusing on the pool of funds that charge 12b-1 fees (Table XXIV) provides with slightly more promising results. In the population of funds that charge marketing commissions to their investors in the form of 12b-1 fees, increases in brokerage commissions decrease performance marginally ($\beta=-0.04$), with varying confidence levels ranging from the OLS model carrying the lowest ($p<0.10$) to the robust and White regressions, which carry higher confidence levels ($p<0.01$); in the clustered regression model the impact of brokerage fees on performance is slightly larger in absolute terms ($\beta=-0.05$, $p<0.01$). Carhart (1997), seminal paper, which focuses on persistence in mutual fund performance, also finds a small effect of trading expenses on performance. Since brokerage commissions are only available in the SAI, the author uses turnover ratio as a proxy. More recently, Edelen’s et al. (2013) work is interested in the hidden costs of mutual fund investing, beyond the reported expense ratio. The authors develop a method to estimate trading costs, their model accounts for turnover rates, also bid–ask spreads, and price impact. As in the results listed above in my sub-sample, funds are not able to recover transaction costs with superior returns; the authors find a strong negative relation between aggregate trading cost and mutual fund’s return (Edelen, Evans, & Kadlec, 2013).

The last one of the expenses considered from my analysis of performance is the percentage of total assets that the mutual funds retain in cash. Cash holdings, as a variable of interest, are a significant regressor of an increase, not a decrease, in performance across all 12 statistical models. The magnitude and significance levels differ by sample and regression model. For three of the four regression models in the full sample (Table XXII), the regression coefficient is $\beta=1.23$ ($p<0.01$) and it is slightly higher for the
clustered regression model $\beta=1.36$ (p<0.05). Similarly, for the sample excluding index mutual funds (Table XXIII), the regression coefficient is also slightly higher ($\beta=1.66$) with a higher p-value (p<0.01) for the OLS than the robust and White regression models (p<0.05). The magnitude of the positive bond between the percentage of cash and performance is higher in the clustered model ($\beta=1.82$) while its p-value remains lower (p<0.10). Finally, the magnitude of the relationship of the percentage of cash on mutual fund performance is still positive and statistically significant in the sample of mutual funds taking 12b-1 fees from investors, but its impact is overall smaller ($\beta=0.88$, p<0.05) in three of the regression models although slightly higher ($\beta=0.92$) with a higher p-value (p<0.01) in the clustered regression model. An increase of one percent in the percentage of cash held by the mutual fund is significantly connected with a 1.23 percent increase in performance for the standard OLS model (p<0.01) as well as the robust and White models (p<0.05) for the full sample (Table XXII). The impact of the percentage of cash is slightly higher when confined in the sample excluding index mutual funds, probably caused by the common tendency of index funds to outperform actively managed funds. Hence, in table XXIII, performance increases by 1.66 percent for each one percent increase of cash in the portfolio of the mutual funds according to the OLS (p<0.01), robust, and White models (p<0.05). The percentage of cash remains a statistically significant regressor of performance in the sample of mutual funds charging 12b-1 fees, table XXIV, albeit a muted regressor compared to the other two samples. An increase of one percent in the mutual fund cash balances is connected to an increase of 0.88 in performance for OLS, robust, and White regression models (p<0.05) and a slightly stronger and more statistically confident relationship in the clustered regression model where a one percent increase in the percentage of cash specifies a 0.92 percent increase in performance (p<0.01). The traditional argument in the financial literature is that cash holdings are costly to investors because they strip them from the future earning potentials of active investments. Both mentions of cash holdings in the financial literature already cited in my initial review, Malhotra and McLeod (1997) and O’Rielly and Preisano (2010) find that cash holdings positively relate to higher expense ratios or to a large portion of the funds’ underperformance.
Cash balances in mutual funds even if they do not cause higher expense ratios as supported by Malhotra and McLeod (1997) are inherently a burden to investors who are expected to pay all of the same commissions in these liquid assets even though they are not earning any return on them. In my sample however, according to table II, descriptive statistics for the cross-sectional dataset, the return on the average mutual fund in 2015 is actually negative and below the average expense ratio. Even the annual return on the S&P 500 that year, only 1.38 percent, is only slightly above the average mutual fund expense ratio, which does not include trading costs and management fees. Hence, for the year 2015, on average, investors are obtaining negative returns from their actively traded portfolios. Under such conditions, as seen on my regression analysis, a cash position might actually be beneficial.

The next set of regressors considers the link between mutual fund performance and corporate governance. The first out of the seven governance variables to consider is the size of the board. There is a negative relationship between performance and the number of board members, although this relationship only manifests significantly once mutual funds have been clustered according to families. It makes sense given that most mutual fund families group their mutual funds boards in two forms: either under a unitary board or under a small cluster of boards (Investment Company Institute, 2015). In the full sample (Table XXII), the number of directors is only a significantly negative regressor of performance in the clustered model ($\beta=-0.11$, $p<0.05$), the coefficients in the other three regression models maintain the same sign but they are much smaller in magnitude ($\beta=-0.02$) and do not reach statistical significance. Likewise in table XXIII, the clustered model is the only output for the sample excluding index mutual funds that yields statistically significant returns. With the smaller sample, the coefficient diminishes in magnitude although it remains at the same statistical confidence level ($\beta=-0.09$, $p<0.05$). The sample of funds that make their investors subject to 12b-1 fees produce coefficients for the number of director regressors that are not statistically significant different from zero (Table XXIV). Table XXII, featuring the full sample, specifies a small decrease of 0.11 percent in performance, on
average, for each one additional director that holds a seat on the board of directors (p<0.05). Excluding index funds from the analysis (Table XXIII), increasing the number of directors marginally decreases performance (β=-0.09 percent p<0.05). In line with my findings, Yermack (1996), one of the pioneers in the study of corporate governance, first introduces the idea of board effectiveness associated to smaller boards. His findings do not emerge from the study of mutual funds’ returns but from the value, approximated by the Tobin’s Q, of large U.S. Industrial corporations between 1984 and 1991. A year later, Tufano and Sevick (1997), in many ways precursors to this thesis, are able to relate the size of the boards to higher expense ratios and lower fund returns, endorsing smaller boards as being more focused and effective negotiator of lower fees, which confirms my results as well. Also supporting my findings, Del Guerico et al. (2003) reaches the same conclusion, relating higher number of directors to increases in expense ratios, with the consequent reduction of mutual funds’ returns.

While the number of independent directors is not a statistically significant regressor of performance in the full sample (Table XXII), or in the sub-sample of mutual funds that externalize their marketing expenses (Table XXIV), it is a significant negative regressor of performance in the sample excluding index mutual funds (Table XXIII). In the statistical significant realm, with every additional independent director occupying a chair in the board, performance in the actively traded mutual funds decreases by 2.02 percent. This relationship is significant in the OLS model, at the ten percent level, and in the robust and White models, at the five percent level. In the clustered regression, the coefficient suggests a relationship is somewhat stronger, a 2.33 percent decrease in performance for every additional independent director, but this relationship is barely significant not reaching the ten percent threshold. Several findings from the prior financial literature align with my results. Although their main focus is to clarify the importance of board independence, Ferris and Yan (2007) attain inconclusive results. One of the authors’ main conclusions is that board design influences the quality of the mutual funds corporate governance. However, their results suggest that the degree of board independence does not carry enough weight to predict the level of fund fees charge, or influence fund performance (Ferris & Yan, 2007).
Focusing on firm value, not mutual fund returns, Bhagat and Bolton (2008) establish a negative relationship between the level of independence in the board of directors and firm performance. Brick and Chidambaran (2010) also provide support for my findings while focusing again on firm performance, not mutual fund return. The authors combine the number of independent directors and the number of board meetings in the same variable to capture the level of monitoring carried by the firms’ boards. Hence, monitoring will be higher for boards with similar number of meetings and similar number of members but a higher proportion of independent directors. According to Brick and Chidambaran (2010), monitoring activity, which could be driven by the number of independent directors, is inversely related to performance. Increasing pressure from the board, a consequence of frequent meetings or higher independence, translates into higher meeting fees and other expenses for shareholders, which could cause a decrease in firm value (Brick & Chidambaran, 2010). Most of these findings are particularly ironic from the point of view of regulators, given the fact that new laws are increasingly requiring more board independence. For instance, the Sarbanes-Oxley Act of 2002 (SOX), the New York Stock Exchange Listed Company Manual, and the NASDAQ Stock Market Internal Listing Guide, recommend that all members of a firm’s audit committee and the majority of board directors be independent.

For each of the standard OLS regressions across the three scenarios set by the different sections of mutual funds considered, directors’ fund ownership plays a role in performance (p<0.05). The magnitude of the impact that directors’ ownership has on performance remains largely close (β≈0.03) although it increases as the number of funds considered diminishes and when funds’ are clustered according to families in the most restrained sample (Table XXIV). Hence, the relationship between directors' ownership and mutual fund performance appears relevant only in four of the twelve regressions. This is not necessarily a sign of a weak relationship, although one should be prone to interpret any of these connections carefully, but it is surprisingly reassuring given the fact that performance is much more time-variant and has much less within-fund persistence than directors’ ownership, which tends to be largely stable. In the full sample, table XXII, although reflected only for one of the regression models
(OLS), funds that are performing well are more likely to be supervised by directors who have a stake in those funds. For each category of ownership above zero, performance increases (β=0.03, p<0.05) in the OLS regression model for the full sample. This pattern holds for the sample excluding index mutual funds (Table XXIII), but is slightly stronger; here for each category of ownership above zero, performance increases by almost four percent (p<0.05) for the OLS regression model. In the population of funds that claim marketing expenses from their investors (Table XXIV), there is also an increase in performance for each category of fund ownership above zero (β=0.04, p<0.05) in both the OLS and clustered regressions models. Both models’ p-values are close to the p<0.01 levels. In the financial literature, Chen’s et al. (2008) results confirm my own. They find that, against anecdotal evidence reported in the media, a majority of mutual fund directors hold shares in several of the funds they supervise. The authors report modest evidence to support a positive relationship between director fund ownership and performance. They suspect this link is driven by superior information on managerial ability possessed by the board (Chen, Goldstein, & Jiang, 2008). Finally, Cremers’ et al. (2009) main purpose is to dissect the relationship between director ownership and fund performance. The authors’ findings align perfectly with mine; they are able to show that director ownership is positively related to fund’s performance. Their explanation for the outperformance of funds that harvest a largest portion of directors’ ownership is dualistic. First, they contemplate the possibility that low ownership accounts for director’s lack of alignment with the interests of mutual funds’ investors. Alternatively, high director ownership might be the consequence of directors’ superior private information if it aligns with superior future mutual fund performance (Cremers, Driessen, Maenhout, & Weinbaum, 2009).

Performance is inversely related to the number of committees in the OLS regression model of the full sample (Table XXII). Still, this relationship is not significant across the other three regression models of the full sample. There is a larger relationship between performance and the number of committees for two of the regression models in the sample excluding index mutual funds (Table XXIII). Yet, in the sample of mutual funds charging 12b-1 fees (Table XXIV), performance is inversely related to
the number of committees only in the clustered regression model. Thus, the relationship between the number of committees and mutual fund performance appears relevant only in four of the twelve regressions at varying degrees of statistical significance but largely at the five percent level. Caution is required when interpreting any statistical results; however, it is remarkable to find these links stretching across samples and methodologies since performance is a widely time-variant variable and has much less within-fund persistence compared to the number of committees variable, which tends to be constant within the large groups of mutual funds belonging to the same mutual fund family and across time. Specifically in table XXII, in the OLS regression model for the full sample, performance is inversely related to the number of committees ($\beta=-0.06$); this association is statistically significant at the ten percent, albeit closer to the five percent level. In the standard OLS and clustered regression models for the sub-sample of actively managed mutual funds (Table XXIII), a decrease in the number of committees is linked to a decrease in performance ($\beta=-0.1$, $p<0.01$ to $p<0.05$). Finally, for the sub-sample charging 12b-1 fees (Table XXIV), an increase of the number of committees is associated with a decrease in performance ($\beta=-0.05$, $p<0.05$) in the clustered regression model. This relationship is not statistically significant in the rest of regressions models from both sub-samples. According to the conclusions from a recent survey conducted by Price Waterhouse and Coopers, most U.S. mutual funds have three committees. The business environment, specifically risks and regulations, drive the configuration and nature of the committees (PwC, 2016). The frequency of board meetings has been used as a metric of board activity in the literature. As noted in table III, there is an almost perfect correlation between the number of committees and the number of committee meetings ($r=0.92$, $p<0.001$). Vafeas (1999) is one of the first authors to analyze the determinants and consequences of board meetings’ frequency. Departing from a sample of 307 firms, not mutual funds, from 1990 to 1994, he finds that the level of board meetings is important for firm value. Although he mostly focuses on past performance, the author is capable of tracing a negative relationship between board monitoring and firm performance, confirming the results that I obtain in my analysis (Vafeas, 1999). Once again, Brick and Chidambaran’s (2010)
findings partly provide support for mine. The authors are interested in how board-monitoring activity affects firm value for a broad panel of firms, not mutual funds, over a six-year period from 1999 to 2005. Their measure for board activity is tied to the number of annual board and committee meetings. Brick and Chidambaran (2010) reveal that higher board monitoring, measured by the number of director meetings, is inversely related to the firm's performance. The number of director meetings is a direct consequence of the number of board committees. The authors focus on prior performance to conclude that poorly performing firms increase their boards future monitoring activity. Although the authors’ focus is on meetings and firm value, approximated by past performance, their discoveries also align with mine (Brick & Chidambaran, 2010). Increasing board monitoring, measured by the number of meetings or committees, erodes firm value or mutual fund performance.

The age of the chair of the board for funds is neither a statistically significant regressor of performance in the full sample nor in the sub-samples excluding index mutual funds or funds charging 12b-1 fees across all the regression models. Only two variables, one control and one variable of interest, are not statistically significant regressors of fund performance across the twelve regressions. To varying degrees, the remaining variables of interest are significant regressors of performance for some of the samples and regression models. While COB age is not a significant regressor of performance, the tenure in years of the chairperson of the board is a statistically significant positive regressor of performance in the full sample (Table XXI) for the OLS model (β=0.02, p<0.05). Similarly, for the sub-sample excluding index mutual funds (Table XXIII), for each additional year of tenure for the COB, there is an increase in performance (β=0.02, p<0.10) in the standard OLS regression. This relationship is not significant across the other three regression models in either sample. However, COB tenure is a statistically significant regressor of performance across all four models for the sub-sample of mutual funds charging 12b-1 fees (Table XXIV). The OLS, robust, and White regression models identify an increase in performance for each additional year the chairman serves the board (β=0.025, p<0.01 to
p<0.05) while the clustered model suggests a slightly smaller increase in performance for each additional year of COB tenure (β=0.02, p<0.10). Although COB age does not emerge as a relevant regressor, it hints towards the same type of positive relationship towards performance that is captured by COB tenure, and the magnitude of its coefficient is about half the one accompanying tenure (β=0.01). Meschke (2007) confirms my results; he finds that mutual funds with longer average director tenure charge lower fees and present higher performance. His results are stronger when he focuses on the 2002-2004 period, but remain statistical significant throughout the entire time horizon of his study, which covers from 1995 to 2004 (Meschke, 2007). Interestingly, as it happens in my regressions, it is only average director tenure and not average director age, the variable that remains relevant with respect to fund fees and performance.

Finally, the last variable of interest that is included in the analysis is one of the most controversial and frequently cited measurements of corporate governance, CEO duality. In the 2004 Amendment to the Investment Company Act of 1940 scheduled to become effective January 16, 2006, the SEC required that mutual funds held at least 75 percent of independent directors and had an independent chair. The 2004 Amendment is never implemented because the SEC failed to provide evidence to link the proposed changes to enhanced investor surplus. In my analyses, funds with a CEO who also serves as the chairperson of the board are more likely to see lower performance reaching statistical significance in 11 of the 12 regression models. In the full sample (Table XXII), across the OLS, robust, and White regression models, there is a half of a percent decrease in average mutual fund performance for those boards with dual COB/CEO status compared to those without dual status (p<0.01 to p<0.05). This relationship is slightly attenuated in the clustered model within the full sample, with a 0.4 percent decrease in average performance for funds with dual CEO/COB status versus independent COB status (p<0.05). This inverse relationship is stronger for the sub-sample excluding index mutual funds (Table XXIII), with a decrease in performance of almost 0.7 percent for those funds in which the same executive shares the CEO and COB roles (p<0.01) in the OLS, robust, and White regression models; in the clustered model a 0.63 percent decrease in performance accompanies those funds with CEO/COB dual
status (p<0.01). With varying degrees of statistical significance, ranging from p<0.01 to on the cusp of p<0.10, the OLS, robust, and White regression models for the sub-sample of funds charging 12b-1 fees (Table XXIV) confirm that funds with COB/CEO dual status have lower performance to the order of 0.6 percent versus funds without dual status; the clustered model maintains the same sign but is the only model where CEO duality is not statistically significant. In the corporate world, Brickley et al. (1997) bring corporate governance and firm valuation together, could not find a statistically relevant relationship between a firm’s leadership structure, approximated by the split in the CEO/chairman roles, and its performance. Meanwhile, Vafeas (1999), using 307 businesses between 1990 and 1994 as his sample, which includes a minuscule three percent of firms with a non-interested chairperson, finds a negative relationship between an independent COB and firm value. On the contrary, Linck et al. (2008) finds CEO duality to be a symptom of CEO entrenchment, causing a lower level of board activity and losses in firm value, which aligns with my results. More recently, Brick and Chidambaram (2010) also provide support for my findings; the authors reveal that firms that move to completely independent committees or hire an independent COB lose value, as measured by the Tobin’s Q. Among the possible explanations for firm value losses that can transcend to mutual funds is the possibility that independent boards might be more inefficient given the need of independent directors and an independent COB to gather knowledge. Alternatively excessive monitoring might also be to blame for managerial restrictions that reduce return potential.
VI. B. Panel data

The following section describes the results of multivariate analysis developed to test the five hypotheses in this study using panel data. This dissertation seeks to build on the work of Tufano and Sevick (1997) using more observations and a longer panel data and addressing several of the limitations noted by the authors of their influential study twenty years ago. The first four hypotheses are intended to increase my understanding of the relationship between mutual funds’ brokerage commissions or executive compensation and alternatively mutual funds’ corporate governance characteristics or expenses. The last hypothesis looks at mutual funds’ performance in its relationship to brokerage commissions and executive compensation plus the rest of the mutual funds’ expenses or corporate governance characteristics that have captured the interest of the financial literature before. In regards to this study, framed within the confines of mutual funds and corporate finance, fixed effects regression models address the endogeneity concerns that could derive from the unobserved time invariant effects that affect the same mutual funds over time. Furthermore, to account for possible biases on the estimators that result from non-linearity, following the prior financial literature dealing with mutual fund expenses, a log transformation is applied to several variables described below. Fixed Effects (FE) regressions can be used to control for year effects, i.e. timely events that affect a wide spectrum of individual mutual funds. For instance, if a recession affects performance across many funds on a specific year within the panel and yearly categorical variables are not included in the model, this macroeconomic event could translate into a positive correlation between several regressors affected by the recession and the error term. The fixed effects models by design introduce a dummy variable per year to capture this kind of timely effects that could affect multiple regressors simultaneously. Hence, fixed effects regressions are also useful in addressing the limitations of non-experimental studies and the potential omission of variables that are difficult to measure. Further considerations on the FE methodology request to contemplate possible serial correlation in the error process. According to Kezdi (2004), failing to acknowledge heteroscedasticity on the error terms can cause biases in the error estimates especially in situations like the one discussed in this
thesis, characterized by a large number of observations per period but potentially not a very long panel. Kezdi (2004) tests robust fixed effects models, implementing numerous Monte Carlo simulations, to debunk the idea that robust standard errors are only valid asymptotically or that robust fixed effects estimators do not perform well in finite samples. In terms of goodness of fit and reliability the author’s simulations reveal that the number of individuals per period is much more decisive than the time-series dimension in panel datasets (Kezdi, 2009). While the Newey-West robust FE may correct for heteroscedasticity and serial correlation, clustering might be useful to reduce the impact of the correlation between a regressor and the error. Consequently, two Newey-West robust FE regressions clustering the funds by family and investment objective are also performed. Funds might share certain traits inherited from the structure that they absorb from the mutual fund family that sponsors them; for instance, mutual fund families hire most mutual funds employees, set up the fund boards, run the mutual funds’ portfolios, market them, etc. so the shadow that mutual fund families cast on mutual fund is long. Alternatively, there are possibly characteristics that are shared by mutual fund belonging to the same investment objective. It would be deceiving from the point of view of this analysis not to account for the possibility that those links might exist and to consider all the observations independent. However, the resulting changes in the estimates of standard errors logically result in decreases of statistical significance for several of the variables. Standard fixed effects estimators overlook correlation or heteroscedasticity in the errors; the cluster-adjusted standard errors from the Newey-West robust fixed effects models do consider these possible deviations. Furthermore, according to Petersen (2009) estimating clustered standard errors within FE in finance panel data constitutes a useful robustness check that every researcher should consider as a companion to the classical FE estimation. However, there are limitations on utilizing fixed effects regression models even when employing robust and clustered FE iterations particularly for panel datasets with a small number of time periods and large sample sizes (Petersen, 2009). These limitations are addressed through the employment of Blundell and Bond’s (1998) Generalized Method of Moments (GMM) models, and heteroscedastic regressions. All statistical models are run using the panel data hand-collected for the purpose of this dissertation, which includes over 2,800 unique year-mutual-fund
individual observations over a period of 17 years, from 1998 to 2015, representing approximately 165 mutual funds per year. The Blundell and Bond’s (1998) (BB98) linear GMM model appears particularly well suited for this research. The Blundell and Bond (1998) system GMM on levels framework allows for the estimation of the unobserved time invariant effects, that disappear in FE or difference GMM models. Furthermore, the inclusion of the time-invariant or rarely changing effects does not affect the estimation of the other regressors (Roodman, 2006). In any panel dataset correlation between the unobserved time-invariant effects and the regressors may lead to endogeneity concerns, and biased parameter estimations. One possible solution against endogeneity is to take the first differences, hence, eradicating the time invariant effect; Blundell and Bond (1998) suggest a different approach, which involves including lags of the dependent variable as instrumental variables in the model. This tactic is not a big departure from 3SLS models. If the model is successful, the lagged dependent variables introduced as instrumental variables should be unrelated to the unobserved time invariant effects and hence, this could address the initial potential problem of endogeneity. To verify this, the Arellano and Bond test for zero autocorrelation in first-differenced errors is conducted on each heteroscedasticity-robust BB98 GMM model. If the result of the test allows one to reject no autocorrelation of first order, but not to reject any second order autocorrelation, then the model assumptions are satisfied and in that respect the model is not misspecified (Roodman, 2006). The methodology works particularly well with unbalanced panels characterized by a relatively small number of time periods and a much larger number of individuals or observations per period. It works well with independent variables that are not strictly exogenous; and the process could be dynamic allowing lagged iterations to influence current ones. Blundell and Bond’s (1998) GMM functions relatively well when heteroscedasticity and autocorrelation across individuals are present (Roodman, 2006). The popularity of the BB98 GMM is due in part also to a lack of assumptions regarding the underlying data generating process. It allows for the unobserved underlying effects captured to change over time, unlike FE, which requires the unobserved effects to be time-invariant. One of Roodman’s (2006) conclusions in regards to utilizing the BB98 GMM properly indoctrinates the researcher on the importance of specifying all choices made in the implementation of the BB98 GMM.
methodology: for this study these specificities are a one-step system GMM, on levels, both standard and heteroscedasticity-robust. The Arellano and Bond test for zero autocorrelation determines the number of lags needed in the dependent variable and the Sargan test reveals that most of my models are over-identified. More regressors, than Sargan deems needed, are kept to verify the relationship, if any, that they have with brokerage commissions and executive compensation (the premise of this research) or even performance. The model implemented in this analysis is a system GMM on levels not on differences, or deviations, because the character of the data is unbalanced, which is caused by mutual funds disappearing from the study due to discontinued operations and by a few new mutual funds being added every year at inception. Using difference or deviations BB98 GMM with unbalanced data is costly in terms of the number of observations that get sacrificed, something that is not recommended with relatively short panels. Furthermore, Soto (2009) finds through Monte Carlo simulations that, particularly in small samples, the system GMM estimator on levels has a lower bias and higher efficiency than the first-differences GMM estimator. I use the one-step estimator instead of the two-step estimator; Windmeijer (2005) finds that for difference GMM regressions, the two-step efficient GMM performs somewhat better than the one-step efficient GMM in coefficient estimation, with less biased and more accurate standard errors, particularly for time-invariant variables. However, I could not find any claims supporting the choice of either one-step or two-step estimation for the GMM on levels methodology so I select to go with the one-step system GMM model (Roodman, 2006). I perform regressions using both the standard GMM and also a heteroscedasticity-robust GMM to address possible heteroscedasticity concerns. The choice of instruments and lags is discussed in detail for each specific regression testing each of the five hypotheses of this dissertation through the next five sub-sections.

Ferris and Yan (2007) recommend the researcher to be aware of the possible presence of endogeneity in statistical analyses, driving false conclusions in studies of corporate governance and board structure. Endogeneity concerns appear when one or more explanatory variables are correlated with the error term in the regression (Wooldridge, 2009). In Ferris and Yan’s (2007) work and in this thesis,
endogeneity would manifest if the same unobserved structure, influencing mutual fund fees, is also affecting corporate governance characteristics; this situation may result in statistically significant regressors depicting spurious relationships among variables, which in fact do not relate to each other but share an external influencer. Ferris and Yan (2007) recommend using instrumental variables to address endogeneity problems. In their selection of the instrumental variables, Ferris and Yan (2007) advocate for regressors that are related to mutual fund complexity, board monitoring, information asymmetry, and incentive alignment. With this purpose in mind, the authors select the following variables: fund life, investment objective, turnover rate, manager tenure, sponsor ownership, independent director fund ownership, and interested director fund ownership. From their selection of instrumental variables, designed to circumvent endogeneity concerns, my analysis is only missing one, interested director ownership; however, instead it includes number of committee meetings, chair tenure, a variable that captures an attempt to reform regulation, etc. which should do a good job capturing fund complexity, board supervision, and the degree of alignment between mutual funds’ boards and their customers. Ferris and Yan (2007) also request that any specific independent variable does not drive the quantitative results and they recommend for the regressions to be robust to alternate independent variables. My statistical analyses satisfy these requirements. There are no instruments in my regression models that are overpowering others. Additionally, in terms of trying different variables in the regression models to test if the empirical results are robust to alternative specifications of the instruments, I tested the following replacements: chair fund ownership was substituted by independent director fund ownership, number of funds overseen by the chair was replaced by the number of funds overseen by independent directors, number of committees was interchanged with committee meetings, brokerage fees was traded by turnover rate, dual COB was switched with COB independent flag, etc. Using the mentioned transformation the results remain unchanged or consistent with the models presented below, which satisfies the requirements set by Ferris and Yan (2007). Finally, Ferris and Yan (2007) demand that the number of instruments exceeds the number of endogenous variables to increase robustness, hence, they only include the three most important board structure characteristics in their analysis: number of directors, board independence,
and independent chair. Following their recommendation, this study also includes the same three core corporate governance characteristics.

VI. B. i. Panel Data Hypothesis I

Hypothesis I:

In testing again my first hypothesis that posits that funds with stronger corporate governance culture in place should present smaller brokerage fees, controlling for other possible characteristics that the financial literature has suggested influence mutual fund expenses, six regression models are run for the entire panel data set from 1998 to 2015.

\[ \text{Brokerage Fees}_{it} = \alpha_{it} + \beta_1 \text{Fund Characteristics}_{it} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Fund Turnover}_{it} + \epsilon_{it} \] (1)

Corporate governance characteristics, including independent directors’ and chairmen’s traits, and other mutual fund characteristics are run as explanatory variables with brokerage fees as the dependent variable using fixed effects, Newey–West robust fixed effects, and two more Newey–West robust fixed effects regression models with clustered standard errors, plus two Blundell and Bond (1998) GMM methodologies, including a heteroscedasticity-robust Blundell and Bond (1998) GMM estimation to account for possible heteroscedasticity. Control variables include mutual fund characteristics considered relevant explaining mutual fund expenses in the prior financial literature. The variables of interest are corporate governance characteristics represented by twelve board of directors variables including: number of directors, number of independent directors, number of female directors, directors’ compensation, directors’ fund ownership, committee meetings, Chairman of the Board (COB) age, COB tenure, number of funds overseen by the COB, COB fund ownership, manager tenure, and dual CEO/COB status. The same cotemporaneous control and variables of interest are included in all four FE regression models; the BB98 methodologies include all the same FE regressors and the one-period lagged dependent as an
instrument. Statistically significant regressors are discussed below with comparisons made across all six regression models.

[Insert Table XXV here]

Table XXV summarizes the results from the regression performed on the panel data depicting the relationship between brokerage commissions and board of directors characteristics for years 1998 through 2015 as discussed in my first hypothesis and modeled by equation (1), across four different fixed effects (FE) regression methodologies. The regression models vary marginally with the standard fixed effects model demonstrating an F=19.75 (p<0.001) and the Newey–West robust fixed effects regression demonstrating an F=14.31 (p<0.001). For both, the standard fixed effects and the robust FE regression models, 16 percent of the variance in brokerage fees is attributable to the linear combination of mutual fund and corporate governance variables. Seven percent and eight percent of the variance in brokerage fee is predicted by the linear combination of mutual fund and corporate expense variables in the robust FE model with standard errors clustered by family and the robust FE model with standard errors clustered by family and objective respectively. Eighty-nine percent (Rho=0.89) of the variance is attributable to the differences across panels for the FE and robust FE models. The percentage of the variance explained by the differences across panels increase to 95 percent for the two robust FE clustered models. Seven of the twelve governance variables are significant in several or all of the regression models. The list of seven significant corporate governance regressors in order of their contribution to the variance of brokerage commissions are: number of female directors, number of independent directors, director compensation, dual CEO, number of directors, COB age, and committee meetings. Additionally, the intercept and five control variables are also significant, in order of magnitude: TNA, turnover ratio, fund life, flow of capitals, and number of other officers. Most control variables regardless of their significance levels exhibit the direction and magnitude that is expected judging by the results gathered in my literature review. See below for an explanation of the statistical significant variables in this section.
As noted in the introduction to the panel data analysis, restraints in applying fixed effects regression models (including unobserved heterogeneity and unbalanced data) are addressed through the employment of a dynamic panel data approach with the Blundell and Bond’s (1998) GMM model. Table XXV B includes the results from the implementation of two Blundell and Bond (1998) models using the same explanatory variables included in table XXV. The BB98 GMM approach deals with possible endogeneity and accounts for the effect of unobserved time-invariant or rarely changing influencing factors. Table XXV B summarizes the regressions results for the panel data depicting the relationship between brokerage commissions and governance characteristics for years 1998 through 2015 as discussed in hypothesis one and modeled by equation (1), with a different panel data approach as intended by Blundell and Bond in 1998 (BB98), and a heteroscedasticity-robust BB98 model. The results vary marginally with the baseline BB98 model demonstrating a Wald $\chi^2=661.5$ ($p<0.001$), and the robust BB98 reaching a Wald $\chi^2=282.61$ ($p<0.001$). The Arellano and Bond test for zero autocorrelation in first-differenced errors is conducted on the robust model. The moment conditions used by Blundell and Bond (1998) only hold if there is no serial correlation in the errors. The Arellano and Bond test seeks serial correlation in the first-differenced errors. If the model is specified correctly, the first difference of independently and identically distributed idiosyncratic errors will be serially correlated; hence, the test will reject the null hypothesis of no serial correlation in the first-differenced errors at order one. However, if the null hypothesis at higher orders is rejected then the moment conditions are not valid and the model is not correctly specified (Roodman, 2006). In my analysis for the robust BB98 specification, the Arellano and Bond test does not present evidence that the model is misspecified. Now six of the twelve corporate governance variables are significant in one or both of the GMM models. The list of six significant board of directors regressors in order of their contribution to the variance of brokerage commissions is: number of independent directors, number of female directors, director compensation, COB fund ownership, manager tenure, and committee meetings. The intercept and five control variables...
are also significant contributors to the variance in brokerage fees. The following are the five control variables in order of absolute magnitude: objective, TNA, turnover ratio, lagged brokerage fee, and flow. Most control variables regardless of their significance levels exhibit the direction and magnitude that is expected judging by the results gathered in my literature review. See below for a detailed explanation of control variables and variables of interest, with comparisons made across statistical models.

Since I believe fund objective has a definite influence in the way mutual funds are run, and therefore it is important to account for it in this regression, designed to identify the determinants of brokerage fees from the perspective of the funds’ corporate governance characteristics. The fund objective categorical variable is mainly time-invariant, which most likely would cause for the variable to be dropped by the fixed effect model. Hence, FE would not provide with an estimation of the effect of investment objectives on brokerage fees. Alternatively, if it appears in the regression’s output, the estimation of the objective coefficient would rely heavily in the few instances in which investment objective switches from one category to another in this panel data. This would result in attenuation bias, which would be reflected also in the magnitude of the standard errors. Multiplying investment objective by year creates an interaction variable and forces objective to remain visible in the regression model. Prather et al. (2004) employ the same technique to retain objective in their regression analysis surrounding mutual fund performance. In CRSP fund objective can take three values, two of them apply to this sample: domestic equity, and bonds. The most numerous investment objective in my sample is equity and therefore is set to be the default group for the categorical variable investment objective in the regression models. In table XXV the interaction variable objective by year is not a statistically significant regressor of brokerage fee in two of the four fixed effect estimations, standard FE and Newey–West robust FE. However, it is an immaterial but statistically significant regressor of brokerage fees (β=0.0003, p<0.001 in the robust FE model with standard errors clustered by fund family. The results albeit very small are remarkable given the large differences in variability between brokerage fees and investment objective. For the BB98 and the heteroscedasticity-robust BB98 models (Table XXV B),
objective is integrated in the estimation without the by-year modification because the Blundell and Bond (1998) methodology allows for the estimation of time-invariant variables. Investment objective then becomes a significantly larger regressor of brokerage commissions. In table XXV B, the difference in the average brokerage commissions from the equity mutual funds to fixed income mutual funds is of 2.2 percent, with lower fees associated with mutual funds mainly invested in bonds, at the highest levels of statistical significance (p<0.001). This same positive and statistically significant relationship between equity mutual funds and brokerage commissions is also reflected in table VI, which employs methodologies framed to fit cross-sectional data. Trading costs in equity markets are very competitive and highly exposed; on the contrary, obscurity primes in the very fragmented over-the-counter bond markets. Academic studies find that trading costs for bonds are higher than for equity (Schultz, 2001; Jones, 2002). From discussions with practitioners I believe the discrepancy between my results and prior studies is due to wide bid ask spreads in bonds. Bond traders incur low quoted brokerage commissions, but very wide bid ask spreads. Mutual funds disclose brokerage fees, which is the variable I examine. They do not disclose the impact of bid ask spreads.

Across most of the works cited in my literature review there is broad consensus in regards to overall asset size providing mutual funds with a competitive advantage extracted from of economies of scale. I suspect that the same scenario might play for brokerage commissions where size could give mutual funds leverage negotiating lower transaction costs. As anecdotal evidence, it is common for electronic trading platforms to give investors a price scale, in which transaction costs diminish as a function of the number of shares traded and price. Furthermore, there are also fixed costs that are incurred regardless of the size of the transaction. These fixed costs get amortized in larger trades and their importance becomes marginally smaller as the average transaction size increases. Mutual fund managers are not required to minimize brokerage costs but to pursue a mutually beneficial long-term relationship with their broker of choice. It is reasonable to assume that as part of this symbiotic relationship, even service brokers will be willing to give more competitive bids to managers from larger
mutual funds, which could potentially direct a sizable portion of their trade volume through them. In table XXV, the linear measurement of mutual fund size, total net assets (TNA), is a statistically significant and negative regressor of brokerage commissions across all four regression models (standard FE, Newey–West robust FE, and the two clustered Newey–West robust FE). Table XXV reveals that a one percent change in TNA reduces brokerage commissions by 0.61 percent, at the highest statistical relevance levels (p<0.001). Both of the Blundell and Bond (1998) GMM estimations (one-step level and heteroscedasticity-robust) performed in table XXV B, find the same effect; for each one percent increase in TNA a 0.70 percent decrease in brokerage commissions is experienced (p<0.001). It is remarkable that the coefficients across all six regressions are so close in value given the largely different principles behind the methodologies. In many disciplines the number of employees or the number of qualified employees is frequently used as a proxy for size. My own version of that measurement, the number of other officers, was manually collected from statements of additional information. A recent compilation of product development empirical studies prompts future researchers to use either revenue or the number of employees as control variables to account for firm size instead of the traditional total net assets’ approach (Kumar & Phrommatthed, 2005). In table XXV from my own analysis, as the number of other officers increases, brokerage commissions decrease across the four FE models (β = -0.02, p<0.05). However, in table XXV B the Blundell and Bond (1998) estimators note no significant relationship between the number of other officers and brokerage fees. As mentioned earlier, the effect of mutual fund size as a catalyst for lower fees has been captured before in the financial literature and it is also shared by the results in the cross-sectional analysis in this same dissertation (Please refer to table VI). During the completion of this work, I encountered several other papers that have reflected this same inverse relationship between size and mutual fund fees, mostly attributing it to economies of scale (Malhotra and MacLeod, 1997; Tufano and Sevick, 1997; Deli, 2002; Walsh, 2004; Adams et al., 2012; Iannotta and Navone, 2012; Malkiel, 2013). In the case of brokerage commissions more competitive pricing might not be as much a consequence of economies of scale, but potentially the result of market power that makes larger funds able to negotiate lower transaction costs. Alternatively, given the prevalence of index funds
in the industry the lower brokerage commissions, detected in larger mutual funds by the financial literature, could be the result of index funds accumulating large amount of assets while requiring very little trading.

Mutual fund risk, measured by the standard deviation of the monthly Net Asset Values (NAV) during the last 12 months, is only statistically significant in two of the six statistical models considered. In table XXV, risk appears to be a small positive regressor of brokerage commissions for the Newey–West robust FE model ($\beta = 0.013 \ p<0.10$) and the Newey–West robust FE regression with standard errors clustered on fund family and objective ($\beta = 0.008 \ p<0.05$). It is not a significant regressor of brokerage fees in table XXV B under the Blundell and Bond (1998) methodology, although the coefficient remains very close in value ($\beta = 0.015$). Sirri and Tufano (1998) in their analysis of mutual fund flows, employ the same measurement for risk. Apart from the interest of the authors to follow mutual fund flow, they care about the behavior of mutual funds’ consumers; they settle for the standard deviation of mutual funds’ monthly net asset values over the last year because this information is readily available to investors. Malhotra and McLeod (1996) construct mutual funds’ beta to approximate for the funds’ risks in their study of mutual fund fees, performance, and risk; they find the funds’ betas have no influence on fees. Employing 3SLS methodology to simultaneously identify mutual fund fees, performance, and risk, Golec’s (1996) findings relating to the relationship between brokerage fees and risk, align with mine. He finds a direct and strong relationship between portfolio turnover and risk. High portfolio turnover would most likely cause high brokerage fees. The author also finds that younger and more confident managers trade more frequently and aggressively, increasing the mutual funds’ risk profile and their brokerage commissions (Golec, 1996). Furthermore, Brown et al. (1996) confirms risk and fees goes hand in hand. The authors confirm my findings with their results, which prove a positive relationship between increases in portfolio turnover, high-risk levels and mutual fund negative returns. Based on empirical evidence gathered from the closed end funds industry, the authors identify that the managers’ desire to manipulate the variable portion of their compensation gets them to increase trading activity. Higher trading activity
or higher turnover causes risk (measured by fund volatility) to also increase, and both effects combined trigger low performance. This association between risk and high turnover generates unfavorably return for investors (Brown, Harlow, & Starks, 1996).

Mutual fund flow is defined as the growth of the funds’ TNA net of dividends’ reinvestment. Subtracting all dividends paid during the prior year allows for the variable to identify new investment only, not on the growth the funds’ assets might have as a consequence of reinvested dividends. It also measures mutual fund pulling power and popularity. Chevalier and Ellison (1997) and Sirri and Tufano (1998) promptly are able to link investors flows to positive mutual fund past performance. The elasticity of mutual fund flows to performance is asymmetric; capital inflows respond more overtly to positive past performance than outflows react to past underperformance. On the contrary, Malhotra and McLeod (1997) find that past performance tends to be mean reverting and erratic and believe investors’ flows instead of following returns should identify funds with lower fees, which are much more stable and easier to predict. In table XXV, from my regression analysis, investors’ flow of capital, as a control variable, is a significant negative regressor of mutual funds brokerage commissions across all four FE regression models ($\beta = -0.007$, $p<0.05$ to $p<0.10$). The coefficient is slightly larger on the BB 98 GMM estimations included in in table XXV B ($\beta = -0.01$); however, it is no longer a significant regressor of brokerage commissions under this setting. More recently Berk and Green (2004) provide the strongest argument in support of my findings. The authors find that as investors get more familiar with the fund, flows become less responsive to performance. Additionally, investors with increased familiarity start to focus more on the mutual fund fees instead of past performance. As the fund expenses increase the flow of funds decreases and the funds’ assets might even shrink. Flows become increasingly less dependent on performance and more negatively related to expenses. If one accepts Berk and Green’s (2004) premise, investors as they familiarize themselves with the fund, might start to care not only about expense ratios but also about the turnover ratio as a source of mutual fund expenses; Forbes magazine has been recommending investors to pay attention to turnover ratios, since transaction costs are one of the hidden
costs of investing in mutual fund (Bernicke, 2011). Therefore informed investors may be withdrawing their funds from more expensive funds, including those that trade more frequently, as suggested by the results.

In order to control for the possible effect that the number of years a fund has been active since inception has on brokerage commissions, fund life is included into the regressions. Presumably, older funds would also be able to execute market power to negotiate lower brokerage commissions, given the long-term relationship that mutual fund managers are supposed to cultivate with their brokers. Although I have not been able to find evidence in prior analyses of the relationship between specifically brokerage commissions and fund age, Golec’s (1996) and Malhotra and McLeod’s (1997) works confirm my findings. The authors, in consecutive years, find that larger and older mutual funds tend to have, on average, lower expense ratios. Fund life also is a significant negative regressor for brokerage fees in table XXV, with an increase in fund’s age of one year accompanying decrease of half of a percent in brokerage fees (p<0.10). However, it is not a significant regressor in the BB98 and BB98 heteroscedasticity-robust models from table XXV B. Morey (2000) also confirms my results when he establishes a clear relationship between fund age and expenses. The author finds a bias in the Morningstar ratings, which tend to favors older mutual funds; in particular, the bias is accentuated for funds that survive over a decade. He also encounters much higher variability of ratings on younger mutual funds. Mutual fund fees and risk-adjusted returns, calculated net of expenses, are among the factors used to shape the Morningstar rating algorithm (Morey, 2002). Furthermore, Kinnel (2010), the Director of Research at Morningstar, reveals that expense ratios and Morningstar ratings are almost perfect substitutes at predicting future fund performance. Hence, Morey (2002) findings linking Morningstar ratings with older funds, indirectly associates older funds with lower fees.

As anticipated, turnover ratio is a statistically strong positive regressor of brokerage fees for all six models. Without such a strong relationship between brokerage fees and turnover one could question the validity of the data and the methodologies employed. Turnover rate reports the percentage of
a fund's portfolio that is bought or sold, whichever is smaller, over the past year and therefore it is intrinsically related to brokerage commissions. In the past, other researchers have used turnover ratios as a proxy for brokerage commissions, given that turnover is readily available unlike brokerage fees.

Turnover ratio’s high statistical significance and substantial positive coefficient is akin to the soundness of the data manually collected for this dissertation. This relationship between turnover rate and brokerage commissions is apparent in table XXV; an increase of one percent in turnover ratio is indicative of an increase of 0.38 percent in brokerage fees (p<0.001 to p<0.01). This direct relationship is similar for both the FE models and the BB98 methodologies in table XXV B (β= 0.35 p<0.001).

The next section of table XXV focuses on the results from the analysis on the variables of interest. The models results are noteworthy, eight out of the twelve corporate governance characteristics (number of independent directors, number of female directors, director compensation, committee meetings, COB age, number of funds overseen by COB, COB fund ownership, and manager tenure) are statistically significant and related to brokerage fees across to six regression models in total, four FE regressions (Table XXV) and two Blundell and Bond (1998) GMM estimations (Table XV B), run alongside the full panel data sample of mutual funds from 1998 to 2015. Roiter (2016) believes the research community needs to start helping mutual funds to develop their own corporate governance identity, to avoid any more regulation faux pas. The author cites several cases of the SEC issuing ill-suited regulation intended for mutual funds that was most likely informed by governance principles that better apply to ordinary corporations. The author feels it is a mistake for mutual funds’ corporate governance to remain entangled with the norms and rules that apply to the corporate governance of regular corporations. Mutual funds need their own corporate governance because of differences in the way mutual funds are formalized as legal entities, the roles of their stakeholders, or the fiduciary duties of the mutual fund board of directors have important implications for the governance of mutual funds. Unlike ordinary corporations, mutual funds are a separate legal entity but also a financial product. Mutual funds and ordinary corporations share stakeholders, such as directors and shareholders, but independent
directors and the occasional independent chair are the only legal employees of mutual funds, everyone else is outsourced from the sponsor. Mutual fund directors’ fiduciary responsibilities in general entail serving the mutual fund shareholders’ interests; however, for mutual funds this means to serve the mutual fund consumers’ interest and not the sponsor shareholders’ interests. Although mutual funds and directors cannot survive without the sponsors’ structure and support their interests are not always aligned, and more so, they are quite opposite (Roiter, 2016).

The first few corporate governance characteristics considered in my analysis, and presented in tables XXV and XXV B, zero in on the board of directors. Roiter’s (2016) paper particularly points at fundamental differences between mutual funds and ordinary corporations as the root of the SEC rulemaking causing painful externalities for mutual fund corporate governance. In particular, the author identifies three instances in which the SEC has wrongfully ruled against mutual funds’ investors interests: in the distribution of mutual fund shares, the composition of fund boards, and the nomination of fund directors. Roiter’s (2016) concerns about the SEC actions regarding the composition of the board derive from the aforementioned 2004 Amendment to the Investment Company Act of 1940 and its unsubstantiated requirements for increased board independence. In both tables, XXV and XXV B, from my research the number of directors is not a significant regressor of brokerage commissions. However, the number of independent directors is a potentially significant influencer of brokerage commissions under both methodologies. Board independence is a significantly large regressor of brokerage commissions showing an inverse relationship. For each additional independent director, there is a 2.6 to 2.7 percent decrease in brokerage commissions (p<0.01) across all four models in table XXV. This pattern is magnified in table XXV B with a four percent decrease in brokerage fees for each one additional independent member of the board (p<0.001). This same relationship between board independence and brokerage fees plays also in the cross-sectional data regressions (Tables VI, VII, and VIII). On the contrary, the number of female directors also has a statistically significant impact on the regression of brokerage commissions but the effect is now positive. In table XXV, the number of female
directors is a significant positive regressor of brokerage fees ($\beta = 2.71$) for the standard and heteroscedastically robust FE estimation and the last robust FE model where the funds are clustered by family and investment objectives ($p<0.001$ to $p<0.05$). In table XXV B, the number of female directors is only a significant regressor of brokerage fees in the BB98 GMM model ($\beta = 1.48$, $p<0.10$). Several conclusions could be drawn from these relationships. It is possible that the fact that the number of total directors on the board is relatively static is to blame for the lack of statistical significance, the 2016 joint-report by the Alliance for Board Diversity and Deloitte reveals that most Fortune 500’s and Fortune 100’s company boards remain fairly unaltered and stable, ranging between nine and ten members. The fact that there are very few new positions that open in boards of directors every year and director turnover is extremely low, the median board age member approaching 70 years old, could be responsible for the lackluster results. However, the financial literature has traditionally being able to present board size as the catalyst for corporate efficiency, with larger boards portrayed as difficult to run and fragmented. From my literature review, Tufano and Sevick (2003) and Del Guercio et al. (2003) both find an inverse relationship between fund board size and expense ratios. In terms of board independence the data suggests that independent directors are doing their job and that mutual funds supervised by more independent boards may be influencing the corporate culture towards a more economically efficient behavior. This could have an effect on brokerage fees if the board is influencing mutual fund managers to select the more price-competitive capital brokers, in lieu of premium service brokers. The results surrounding the soft dollar compensation variable in the next set of regressions, tables XXVI and XXVI B, suggest that this is in fact a possibility. Confirming my statistical findings, Del Guercio (2003) demonstrates that mutual fund board independence is associated with lower expense ratios. The author finds that mutual funds that have a higher number of independent directors have lower expense ratios. Finally, in terms of the effects of board gender diversity on brokerage fees, several recent studies outside of the realm of mutual funds look at the impact of increasingly diverse boards on firm performance or firm value, as a result of the shift in recent years towards equality (Carter, Simkins, & Simpson, 2003) (Rose, 2007) (Campbell & Vera, 2010) (Ahern & Dittmar, 2012). With respect to increased board
diversity and firm performance, instead of a causal relationship as sometimes is presented by these studies, perhaps the results reflect the fact that more successful firms are more likely to expand their boards, or to be prone to want to change the composition of their board, to address social responsibility concerns. Adams and Ferreira (2008) not only consider the effects of female directors on firm valuation, the authors also examine the effects that women on the board have on corporate governance. They find that women tend to have better attendance, are more likely to sit on monitoring committees, and that female directors increase CEO accountability, making CEO turnover more dependent on performance. It seemed possible that the increase in brokerage fees associated with having more women on the board was capturing part of the same phenomena identified by Adams and Ferreira (2008) and the managers from these mutual funds, with more gender diversity in their board, felt the pressure to perform and therefore traded more intensively. However, the negative correlation between turnover and number of female directors, captured in table V, suggests otherwise; there is a small positive correlation between the number female directors and soft dollar compensation, so higher brokerage commissions might be the result of higher external research demands identified for funds with higher board gender diversity.

Some of the interest on executive compensation during recent years directs its attention to the substantial increase that director compensation has experienced in recent periods (Brick et al., 2000; Bryan et al.; 2000; Adams and Ferreira, 2008). Farrell et al. (2008) goes even further trying to identify not only the catalyst for this unparalleled increase in director compensation but also how much of it is the result of the introduction in most corporations of the performance-based or equity-based compensation. The authors’ approach is difficult to translate to a mutual fund industry focus, as Roiter (2016) points out; mutual funds have certain specificities that do not apply to the general cross-section of corporations. If mutual fund directors receive equity compensation, in the form of shares from the mutual fund sponsors, the intended or unintended consequence would be to align their interest to the mutual fund family, not to the mutual fund customer that they are supposed to represent. Similar to the phenomenon Sirri and Tufano (1998) document with respect to mutual funds’ flow, Farrell et al. (2008) reveals that director
compensation is more likely to adjust upwards in response to positive past performance but it lingers much longer when it is time to respond to a downward correction. If brokerage fees have drastically grown also in parallel with director compensation, then this relationship might be capturing part of the shared deterministic trend in the two variables. However, table IV, which contains the descriptive statistics from three key periods included in the panel dataset expanding over 17 years, shows that while director compensation has grown by more than 287 percent over this period, brokerage commissions, as a percentage of TNA, have decreased by about 30 percent. In my analysis, independent director compensation is positively related to brokerage commissions. Each one percent increase in director compensation is associated with approximately half of a percent increase in brokerage fees across, all for FE models in table XXV (p<0.001 to p<0.01). The BB98 and heteroscedastically robust BB98 models in table XXV B confirm this positive relationship, with a slightly higher coefficient at the highest level of statistical resonance (β= 0.53, p<0.001). Tufano and Sevick (1997) bring attention towards a resolution from the U.S. Court of Appeals for the Seventh Circuit in regards to the standards that apply to the fiduciary responsibilities of mutual fund investment sponsors (Olesh v. Dreyfus Corp., 1995 WL 500491). In their arguments the prosecution cites disproportioned independent director compensation as an influential factor corrupting their ability to negotiate lower fees for mutual fund customers. Tufano and Sevick (1997) see this possible behavior of independent directors as ‘rent sharing’. What is observed in the relationship between director compensation and brokerage commissions is possibly another aspect of that same behavior. Well-paid directors might be less likely to impose internal control mechanisms to limit the amount of non-competitive trading that a mutual fund manager can execute. Well-paid independent directors might be more willing to let mutual fund managers enjoy the perks of soft-dollar compensation, which as seen on tables XXVI and XXVI B is also positively related to brokerage fees.

Aforementioned, citing the innate characteristics of mutual funds corporate governance identified by Roiter (2016), it would be detrimental, from the point of view of mutual fund customers, to link part of the compensation of independent directors to the stock price of mutual fund parent companies because of
the opposite role mutual fund fees play on the sponsors’ stock value and mutual funds’ returns. Mutual fund sponsors are banned from offering mutual fund shares to independent directors at a discount from their NAV. One way in which mutual fund sponsors try to link independent director’s interests with those from mutual fund customers is by offering to them the purchase of fund shares through a deferred compensation plan (Khorana, 1996). Khorana (1996) determines that over 40 percent of the mutual funds in his sample offer this kind of incentives to directors. Deferred compensation provides tax advantages to directors and might persuade them to invest in the funds they supervise more heavily. Unlike director compensation, director fund ownership, in my sample, shows no statistically significant relationship to brokerage fee in either table XXV nor table XXV B, although, as compensation it maintains a positive a coefficient throughout. Conversely, although COB funds ownership is not a significant regressor of brokerage commissions across the four FE models of table XXV; however, it is a significant regressor of brokerage fees in the BB98 and robust BB98 GMM models. In table XXV B, COB fund ownership is a small positive regressor of brokerage fees (β = 0.09, p<0.05). Unfortunately, there are no examples in the prior financial literature to link board ownership and brokerage expenses or turnover ratios. The only mention to director ownership in relationship to mutual funds expense ratios refers again to Chen et al. (2006) and Cremers et al. (2006). Both teams of researchers believe that the combination of high mutual fund board ownership and low independent director compensation usually accompanies mutual funds with high performance and therefore potentially lower fees.

Table IV, the panel data descriptive statistics, shows that the number of funds overseen by the COB increases considerably overtime to surpass 133, on average, per chairperson in 2015. In the traditional corporate governance literature busy boards are characterized as boards in which directors occupy more than three seats. According to table VI, mutual fund boards from my sample classify as busy boards even by 1998. Fich and Shivdasani (2006) believe that, busy boards spread weak corporate governance, which translates into poor performance and depressed firm values. Additionally, busy independent directors become the pathogen that can transmit negative abnormal returns and lower CEO
turnover sensitivity to firm performance to other firms in which they serve (Fich & Shivdasani, 2006). Table XXV from my analysis, paints a different picture, the number of funds overseen by COB is a significant negative regressor of brokerage commissions for the FE (p<0.01) and Newey–West robust FE (p<0.05) models with each one additional fund led by the chairman of the boards depicting of a 0.76 percent decrease in brokerage commissions. The coefficient on the number of funds overseen by the chair remains negative but it is no longer a significant regressor of brokerage fees for the one-step BB98 on levels or the heteroscedastically robust BB98 GMM models (Table XXV B). The same negative and statistically significant relationship is present in tables VI, VII and VIII, referring to COB ownership and brokerage commissions in the context of panel data. Hence, my findings contradict those reported by Fich and Shivdasani (2006) but they align with another faction of corporate governance researchers that see busy boards as conduits of knowledge and experience. Experience or knowledge might come from managerial positions for interested directors but for many independent directors is the direct consequence of their service in multiple boards. Ferris’ et al. (2003) study perceives no difference between busy and non-busy boards in terms of performing effective monitoring. Similarly, Harris and Shimizu (2004) confirm my results by defending busy boards, who in their opinion have been vilified by academics and practitioners alike, probably in part as a consequence of their relatively high compensation. The authors prove that the accusations of busy directors overextending themselves are groundless. Their study evaluates firms’ performance from busy and non-busy boards, framed by their influence on corporate acquisitions. They share that busy boards recommendations are more knowledgeable and enhanced performance outcomes post-acquisition (Harris & Shimizu, 2004).

One of the misconceptions that Harris and Shimizu (2004) are set up to challenge, precisely with their first hypothesis, is the general idea that busy directors are more likely to miss board meetings. According to the authors, directors’ main contributions to any firm happen during board meetings, when they can offer their advice or participate in decisions. Hence, if directors are not present during board meetings their value to the firm is greatly compromised. In my sample, according to table IV, the panel
data descriptive statistics, the average number of cumulative committee meetings for 2015 is 18, so possible scheduling conflicts might arise for busy directors. In my statistical analysis, the number of committee meetings is a significant variable of interest for some models in both table XXV and table XXV B. In table XXV, the number of committee meetings is a small but significant regressor of brokerage fees for the classic FE and Newey–West robust FE models, and the also heteroscedastically robust FE estimation with clustered standard errors on family and investment objective ($\beta = 0.013$, p<0.01). It is not a significant regressor for the robust FE model clustered only by mutual fund family. With a little less statistical confidence, this relationship holds true in table XXV B for both the BB98 and the robust BB98 GMM methodologies ($\beta = 0.011$, p<0.05). Vafeas’ (1999) paper is completely dedicated to the role that board-meeting frequency plays on firm performance; his findings largely align with mine. Contrary to common believe, the author finds that the annual number of board meetings has a negative effect on share prices. This negative relationship between increases in board activity and firm value might be caused by several factors according to the author. First, he postulates that directors meet more frequently than what they would like in order to fulfill their duty to serve shareholders’ interests, this is particularly true for busy directors. Alternatively, Vafeas (1999) considers board meetings are largely a waste of directors’ time since very little useful information is shared during the meetings, too much time is spent on routine tasks, and the chairman, whose interests sometimes do not completely overlap with those from the shareholders, sets much of the agenda. Thus, according to the results from my regression and Vafeas’ (1999) findings, the consequences of higher board activity are poor performance either in the form of depressed stock prices or higher mutual fund expenses piled against investors returns.

Traditionally, the chairman of the board has one of the most important roles in any corporation, he is the embodiment of the firms’ corporate governance and must ensure that the interests of shareholders are protected and therefore the board is fulfilling its duties. In my analysis however, COB age is only a small positive significant regressor of brokerage commissions in table XXV ($\beta = 0.03$, p<0.05) for the classical FE model. Del Guercio et al. (2003) finds that directors’ tenure erodes their
independence, and that their influence as advisors diminishes making them less effective, casting higher fees on investors. Other studies have failed to find a relationship between COB age and profitability. Waelchli and Zeller (2013) cannot replicate their main findings, a strong negative relation between COB age and firm performance, in a different sample populated by Swiss firms. Additionally, Bhagat et al. (2010) fails to do the same for a sample of large publicly listed U.S. companies.

Switzer and Huang (2007) main objective is to discover how the role of human capital affects mutual fund performance. In particular, they are concerned with how experience and education relate to mutual fund returns. The authors’ definition of what constitutes human capital in the mutual fund industry includes: manager tenure, experience, gender, if the manager has completed an MBA, and if he has received the CFA accreditation (Switzer & Huang, 2007). In my sample manager tenure is not a significant regressor of brokerage fees across the four FE models contained in table XXV. However, manager tenure is a statistically significant negative regressor of brokerage commissions in the BB98 and heteroscedastically robust BB98 GMM models of table XXV B. Manager tenure is a small negative regressor of brokerage fees, with every additional year the manager remains at the helm of the mutual fund, brokerage expenses decrease by 0.7 percent (p<0.001). A possible explanation for the decrease in brokerage commissions parallel to the increase in manager tenure is that it is easier to develop a long-term relationship with a brokerage house overtime if the same mutual fund manager remains in the position longer. A more experienced manager has more leverage negotiating lower fees, even with service brokers, because they are aware of his legacy and reputation. I could find several accounts in the prior financial literature that support my results. Golec (1996) is set to identify the relationship between mutual fund performance, risk, or fees with any of the managers’ traits that he can find. The author finds several relevant traits that shape these relationships. He is capable of tracing better risk-adjusted performance to managers that have completed an MBA, younger managers but not inexperienced managers, because as in my analysis, longer manager tenure is associated with better risk-adjusted mutual fund performance (Golec, 1996). Similarly, Switzer and Huang (2007) also confirm my results, using a sample of 1,004
small and mid-cap equity mutual funds for the year 2005. The authors indicate that mutual fund managers’ human capital characteristics influence the funds’ performance. In particular, they share that women and managers with a CFA certification have higher portfolio turnover and incur in higher systematic risk in their investments. However, in general this increased trading and risk-loading behavior does not yield in their case higher returns. The only other significant relationship the authors could find includes manager tenure and mutual fund fees. The authors learn that longer manager tenure, associated with longer investment experience, tends to result in higher expense ratios, which in fact translate into underperformance (Switzer & Huang, 2007).

VI. B. ii. Panel Hypothesis II

Hypothesis II:

In testing my second hypothesis, which postulates that, after controlling for other influential factors, funds with higher expense ratios would tend to also have higher brokerage fees, I run six statistical models on my panel dataset expanding over 17 years.

\[
Brokrage\ Fees_{it} = \alpha_{it} + \beta_1 Fund\ Characteristics_{it-1} + \beta_2 Expense\ Ratio_{it-1} + \beta_3 Fund\ Turnover_{it} + e_{it} \tag{2}
\]

Expense variables and mutual fund characteristics are run as regressors for brokerage fees using fixed effects, Newey–West robust fixed effects, and two different also heteroscedastically robust fixed effects clustered regressions against panel data expanding from 1998 to 2015. Additionally, two Blundell and Bond (1998) generalized method of moments estimations are also performed using the same panel dataset and employing largely the same regressors. The regression models include mutual fund characteristics as control variables to account for mutual funds’ traits that the prior financial literature finds relevant explaining variation in mutual funds’ expenses. The five expense characteristics included as variables of interest in this model are: the leftover portion of the expense ratio after excluding
management fees and 12b-1 fees, management fees, 12b-1 fees, and the percentage of the mutual fund’s total assets that the portfolio manager keeps as cash. Statistically significant regressors are discussed below in this section, following the overall model descriptions, with comparisons made across regression models.

[Insert Table XXVI here]

Table XXVI summarizes the regressions results for the panel data depicting the relationship between brokerage commissions and other expense characteristics as discussed in my second hypothesis and modeled by equation (2), across four different regression methodologies. The regression models are very consistent with an $F=25.07$ ($p<0.001$). Furthermore, the linear combination of the independent variables explains three percent of the variance in the brokerage fee dependent variable with an $R^2=0.03$ for the FE and heteroscedastically robust FE models. The $R^2=0.13$ and $R^2=0.14$ for each of the clustered Newey–West robust FE regressions respectively. Eighty-eight percent (Rho=0.88) of the variance is attributable to the difference across panels for the FE and robust FE models and a slightly lower percentage for the two clustered models (Rho=0.85). The intercept is not statistically significant but four control variables are: dead flag, turnover ratio, soft dollar flag, and TNA. Three of the four variables of interest demonstrate a statistically significant relationship with brokerage fees. In order of magnitude, the following variables of interest contribute to the variability in brokerage fees: management fee, expense ratio (excluding management and 12b-1 fees), and percentage of cash.

[Insert Table XXVI B here]

Table XXV B summarizes the regressions results for the panel data depicting the relationship between brokerage commissions and expense characteristics, as discussed in hypothesis two and modeled by equation (2), using the dynamic panel data model extended by Blundell and Bond in 1998 (BB98) and the robust version of the same model that mitigates heteroscedasticity concerns. The regression models vary marginally with the BB98 model demonstrating a Wald $\chi^2=551.62$ ($p<0.001$), and the BB98 robust
with a Wald $\chi^2=124.59$ ($p<0.001$). The Arellano-Bond test does not present evidence that the model is misspecified. The intercept is statistically significant as are six of the eight control variables in order of absolute magnitude: cumulative return, dead flag, objective, soft dollar flag, turnover ratio, and lagged brokerage fees. In order of magnitude, the following variables of interest contribute to the variance in brokerage fees: manager fees, and percentage of cash. All control variables regardless of their significance levels exhibit the direction and magnitude that are to be expected judging by the results gathered in my literature review. See below for an explanation of control variables in a subsequent section.

Once again the interaction of **fund objective** and year is included in the model in order to keep investment objective as part of the regression. I follow the approach introduced by Prather et al. (2004) whose intent is to identify the effect of investment objective on mutual fund returns. The mutual fund objective codes assigned by CRSP are broad enough that for the most part mutual funds remain in the same objective category for the duration of the panel. Furthermore fund objectives are relatively static since mutual funds are largely named by their investment objective or their asset allocation strategy. When the largely time-invariant investment objective is not introduced as an interaction variable then it most likely will not appear in the regression output and if it appears it carries attenuation bias. However, not including investment objective at all in the regression does not mean that it is not considered in the estimation; it will just be a part of the unobserved time invariant effects. Including investment objective provides more information on how different investment objectives affect brokerage commissions. Using CRSP fund objective codes I distinguish between equity and bond mutual funds, setting equity funds to be the control group. Table XXVI reveals that investment objective by year is not a statistically significant regressor of brokerage commissions under any of the FE specifications. On both Blundell and Bond (1998) GMM methodologies (Table XXVI B), investment objective is run without interacting with year. Under the GMM models, the largely time-invariant investment objective regressor can be estimated and it appears as a significantly large regressor of brokerage fees. Investment objective suggests that the
differences between the means from each group of funds are statistically relevant; brokerage fees for the funds that specialize in bond trading are 1.3 percent (p<0.001 to p<0.05) in the BB98 and heteroscedastically robust BB98 models from table XXVI B. These results deserve to be interpreted with caution. An empirical paper by Kim et al. (2000) reveals that it is fairly common for mutual funds to misreport their investment objective. The authors recommend mutual fund customers to be more methodical when they are making their investment decisions and to actually verify the kind of assets that the mutual fund carries. According to Kim et al. (2000), from 1993 to 1998 more than half of the 2,500 mutual funds included in their sample report investment objectives that do not match their actual investment patterns; furthermore, almost a third of them are completely misclassified. The authors also realize that when mutual fund managers deviate from their reported investment objective they tend to take more risk than what they have stated in their prospectus. This lack of consistency on the way investment objectives are reported by mutual fund families might be in part responsible for the lack of significance of the interaction variable in my regressions.

Although size is broadly considered an important determinant of mutual fund performance, because mutual fund fees are dependent on net fixed assets, its influence on brokerage fees is susceptible to model specifications. Perhaps the mutual fund expenses included in the regression are capturing part of the effect that mutual fund size, as measured by TNA, would have on brokerage commissions. Judging by table V, the correlation matrix for panel data, all correlation coefficients between TNA and mutual fund expenses are below 0.2 (p<0.001). Hence, it is considered safe to include both TNA and all of the mutual fund expenses in the same regression. My main interest with these regressions is the relationship between mutual funds expenses and brokerage commissions; to be meaningful the relationship ought to be in as much of a pure form as possible. Hence, it could be argued that it is necessary to include TNA in the regression to prevent other expenses from having a spurious relationship with brokerage commissions. Without TNA in the regressions, these relationships might have been driven by TNA, which influences all of them. In my analysis from table XXVI, total net assets (TNA) as a linear measure of mutual fund size,
is a significant negative regressor of brokerage commission across all four regression models (FE, Newey-West robust FE, and two additional heteroscedastically robust FE models with clustered standard errors). A change of one percent in TNA is connected with a decrease of 0.36 percent (p<0.05 to p<0.10) in brokerage fees. In table XXV B, the relationship is almost zero and not significant under the BB98 and heteroscedastically robust BB98 models. Although the effect of size as a fee reduction mechanism has been widely documented in the previous literature, its relevance has also been questioned. For instance, Indro et al. (1999) believe that for mutual fund customers, ‘bigger is not always better’ when it comes to the effect of mutual fund size on fees and performance. The authors believe that there is an optimal size range for mutual funds, below the range the fund does not reach the same efficiency levels that are available with scale; the costs of trading and information are not fully amortized. However, there are marginally diminishing returns to increasing size, and above the optimal size threshold certain trading strategies become too difficult to implement or more scarce (Indro, Jiang, Hu, & Lee, 1999). The fact that Indro et al. (1999) reveal that mutual funds need to surpass a critical mass before they can take advantage of economies of scale, combined with additional evidence presented by the authors of an increasing number of funds closing their doors to new investors, suggest that the relationship between mutual funds’ size and expenses is not linear and that is perhaps why it escapes the two BB 98 models.

In their quest to clarify the extreme disparity in mutual fund fees by controlling for mutual fund heterogeneity, Iannotta and Navone (2012) successfully identify several mutual fund characteristics that potentially represent significant determinants of expense ratios. Among the traits the authors consider is the **cumulative gross return** over the prior 36 months. Similarly, my regressions for the effects of mutual fund expenses on brokerage commissions include the cumulative return over the last 36 months net of fees. In two out of the six models considered in tables XXVI and XXVI B, cumulative return decreases with brokerage commissions. According to both Blundell and Bond (1998) GMM methodologies, cumulative returns have a strong negative association with brokerage commissions at the highest level of statistical significance. In both the one-step on levels and the heteroscedastically robust
BB98 GMM estimations, the impact of cumulative returns on brokerage fees is slightly larger in absolute than in the FE models. As the performance of the mutual funds over the last three years improves by one percent current brokerage commissions decrease by 5.57 percent (p<0.001). This connection remains negative in table XXVI albeit it does not reach statistical significance. Contrariwise, Iannotta and Navone (2012) cannot find a significant relationship between past gross returns and fees. Since their goal is to explain management fees, when they find no link to performance, Iannotta and Navone (2012) interpret their results as a symptom of investors willingness to remunerate managerial ability for more than what they actually receive in exchange, which is inefficient. They do find empirical evidence that supports my findings; Iannotta and Navone (2012), also employing fixed effects models, demonstrate that funds with higher turnover, as a proxy of brokerage fees, have higher expense ratios, and for obvious reasons achieve lower performance (Iannotta & Navone, 2012). Alternatively, Brown et al. (1996) also provide empirical evidence that aligns with the results that I present in table XXVI B. After following 334 funds over 15 years, the authors show mutual fund managers tend to respond to unfavorable performance by increasing turnover, in an attempt to turn their luck around; turnover causes portfolio volatility which usually translates into higher fees (Brown, Harlow, & Starks, 1996). A version of the of the same phenomenon might be at play here, mutual fund managers with robust past performance do not need to prove themselves to investors as much so they do not try to overcompensate trading intensively. Furthermore, it also possible that overconfident managers tend to trade more, piling up higher brokerage fees, which ultimately are responsible for the lower performance.

The purpose of tables XXVI and XXVI B is to identify the relationship between mutual fund expenses and brokerage commissions, which are another mutual fund cost arbitrarily excluded from the mutual funds’ expense ratio. While the expense ratio is readily available for investors in the prospectus, their mutual fund family’s website, or Morningstar, investors would have a hard time locating brokerage commissions, albeit they constitute another portion of mutual fund expenses that they are also responsible for paying. As Edelen et al. (2013) point out expense ratios not only exclude brokerage fees but also
ignore other expenses incurred by mutual fund customer such as: initial or deferred sales charges, tax
effects on capital gains, etc. They propose an alternative to turnover ratio as a proxy for brokerage
expenses, something that would be inclusive of the different expenses that are related to transacting
(Edelen, Evans, & Kadlec, 2013). Generally, turnover ratio identifies the portion of a fund's investments
that has been bought and sold over the past year; a higher turnover rate likely translates into higher
brokerage commissions. This relationship is apparent in table XXVI, as an increase of one percent of
turnover ratio is associated with an increase of 0.46 percent in brokerage commissions (p<0.001 to
p<0.01). The behavior is similar for the one-step on levels BB98 and heteroscedastically robust BB98
models (β= 0.30 p<0.001) in table XXV B. The ranges of the coefficients are extremely close to the ones
presented in tables XXV and XXV B discussed before. Although Edelen’s et al. (2013) proxy for
transaction costs is much more thorough than the standard of just using turnover ratio, the results obtained
from all of my regressions, using brokerage commissions as the dependent variable and having turnover
ratio as one of the control variables, indicate that there is definitively a strong and positive relationship
between the two; hence, turnover ratio may constitute a good approximation for brokerage commissions
and has the advantage of being widely available.

As mentioned in the data section, once I have garnered the initial sample of mutual funds that I
identified as my panel data population I did not go back and delete any of them from my sample,
regardless of how many periods the lasted. I lost several mutual funds over the seventeen-year period.
Frequently the less successful funds are dropped; this is usually announced by a footnote in the
prospectus, reporting that their remains have been scattered to a fellow fund. Maintaining funds in the
panel that do not make it all the way through the 17-year period is not cost-free. However it helps
reducing the survivorship bias that looms over so many mutual fund studies. Prather et al. (2004) from
my literature review blames discrepancies between their findings and their predecessors’ results from the
financial literature largely on survivorship bias that are not properly addressed. I also follow their
recommendation to avoid survivorship bias by adding newly created funds every period as long as I can
include them since inception (Prather et al., 2004). However, having funds coming in and out of the sample has consequences it results in an unbalanced panel dataset. According to Wooldridge (2009) unbalanced panels are not inherently bad and the mechanics of FE with unbalanced panel dataset remain largely the same. Wooldridge’s (2009) main concern in this respect is the reason why this attrition, the disappearance of observations in the panel, occurs. If the reason of the departure is correlated with the idiosyncratic errors, then a possible sample selection problem is present and the estimators might be biased (Wooldridge, 2009). Although there are multiple reasons for why a mutual fund is withdrawn, it has to do mostly with returns and size. Given that mutual funds are businesses drawn to make a profit, if a fund is successful and is attracting new customers’ investments, it is inconceivable that the mutual fund sponsor would decide to cancel it. Since I also include TNA and cumulative returns in my regressions as control variables, the fear that the reasons for the departure will end up in the idiosyncratic errors and that they are not being addressed is contained, and the biases’ concerns diminished. In my sample, dead flag is a dichotomous variable that one year prior to the mutual fund being delisted from the sample takes the value of one. Therefore it identifies the fund during the year leading to its disappearance. There might be several things playing at once before this process is triggered; quite possibly the fund is experiencing poor performance, maybe increasing its volatility and risk, trying to compensate for the loss in performance. It is also possible that simultaneously, investors are abandoning the fund. Most of these circumstances would cause turnover ratio to escalate while brokerage fees increase. In my analysis from tables XXVI and XXVI B, the attrition indicator offers inconclusive results as a statistical significant indicator of brokerage commissions. It is only a small, statistically significant, and positive regressor of brokerage fees in table XXVI for the Newey-West robust FE and the other two heteroscedastically robust FE regression models with clustered standard errors (β= 0.7, p<0.001 to p<0.01). Conversely, the death indicator for the standard BB98 GGM estimation resonates a bit more showing negative connection with high brokerage fees (β= -1.7, p<0.05), in table XXVI B. In several instances the prior financial literature presents conflicting results as well. As indicated earlier, there is an inverse relationship between performance and mutual funds’ attrition. Elton et al. (1996) extensively document the relationship
between mutual funds’ mortality rates and sustained poor performance, citing also the failure to reach critical mass as another cause. From the opposite side of the spectrum, well-performing funds behave in a contrary fashion; my results are also consistent with Khorana’s (2001) findings, which relate declines in turnover ratios to periods following the identification of funds as top-tier of performers (Khorana, 2001). Similarly, Morey (2003) encounters low turnover and mean reversion in mutual fund performance right after mutual funds have being identified as top performers or recognized with the prized Morningstar five-star rating, (Morey, 2003).

By definition, soft dollar brokerage commissions are premium rates paid by portfolio managers to service brokers in exchange for executing trades; they normally include rebates in the form of third-party research (Horan & Johnsen, 2004). The soft dollar industry is regulated by the 1975 Section 28(e) amendment to the Securities Exchange Act of 1934. The amendment does not require funds to minimize brokerage commissions and it is vague in its definition of what constitutes research. Blume (1993) focuses on soft dollar compensation; using self-reported survey data, the author identifies that approximately 40 percent of all transactions use service traders, which offer soft dollar compensation in return. Therefore, judging by the definition of soft dollar brokerage commissions as a premium service and its prevalence, they ought to be an obscure add-on cost to investors that make brokerage fees comparatively even more harmful to performance. Furthermore, the implications of soft dollar compensation are not clear; Horan and Johnsen (2004) find that the premium trades bring superior risk-adjusted return and oddly higher managerial compensation, approximated by management fees. In my sample, using manually collected data, a categorical variable is created if the fund is directing part of their trades through service brokers. Several mutual funds, in their statement of additional information, list the amount of brokerage commissions that are paid to service brokerage houses. Using table IV, the descriptive statistics from the panel data sample, it can be observed that soft dollar brokerage commissions account for between 12 and 27 percent of all brokerage fees for the three years selected from the 17-year panel. Through all six statistical models in tables XXVI and XXVI B, the soft dollar
compensation flag is identified as a positive and statistically significant regressor of brokerage commissions with varying degrees of statistical significance. When a mutual fund is identified to use service brokers for that period, investors can expect brokerage commissions to increase on average by over 0.4 percent (p<0.01 to p<0.05) for all the FE regression models of table XXVI. In table XXVI B, the magnitude and statistical confidence, of the positive relationship between brokerage fees and the identifier of funds using service brokers, are lower for both BB98 GMM estimations (β= 0.3, p<0.05). The regressions merely confirm that transacting through service brokers is more expensive to investors, but that is expected given the definition of what constitutes soft dollar brokerage fees. The next question is to determine if they constitute a net loss or a net profit to mutual fund investors. If service brokers are more efficient conducting or providing research and that translates into savings and superior performance for the mutual fund, then, mutual fund customers would be better off as a consequence of portfolio managers using service brokerage houses. This question is addressed in section VI.B. v. Panel Data Hypothesis V, which contains the results from my regression analyses exploring the relationship between soft dollar compensation and performance. The results in that section, as reflected by table XXXI B, reveal that soft dollar compensation casts a negative effect on performance.

All of the expense characteristics (expense ratio, management fee, and percentage of cash), except one, are statistically significant in the full sample of panel data (Table XXVI), across all four fixed effects regression-models. The results are mostly immune to model specification, so they remain largely unchanged under the Blundell and Bond (1998) GMM methodologies (Table XXVI B). As positioned by my second hypothesis, I expect to find a significant relationship between brokerage commissions and other mutual fund expenses. All mutual funds expenses should function in a similar fashion; hence, funds that tend to have higher expense ratios, might also be less cost-efficient in terms of brokerage commissions. The results reveal that all of the considered fees have a direct relationship with brokerage commissions, which confirms my initial intuition. Two research papers ratify the relationship between brokerage fees and expenses. Khorana (1997) shares a strong positive relationship between portfolio
turnover and mutual funds expenses, particularly for mutual funds’ managers that are falling behind in performance and are likely to be replaced. Chevalier and Ellison (1999) find the intersection of turnover and expenses highly influential. The authors find that when turnover is paired up with other fund expenses, it takes a significant role explaining mutual fund performance and manager compensation. The authors show a significant concentration of high turnover on mutual funds that also experience high expenses, suggesting that these funds might also have ‘unreported expenses’. Unreported costs are brokerage expenses and soft dollar compensation, which are not included in the expense ratio. From the authors’ perspective, the concurrence of high expenses and high turnover is not serendipitous it translates into investors paying a very hefty price in exchange for trades and from service brokers (Chevalier and Ellison, 1999).

Among the expense variables, the **expense ratio excluding management fees and 12b-1 fees** is a strong statistically significant regressor of brokerage commissions (β= 6.96, p<0.01) for the FE and Newey-West robust FE models and an even stronger and statistically significant regressor of brokerage fees (β= 7.4, p<0.01); for both heteroscedastically robust FE clustered models in table XXVI. Similarly, the **management fee** portion of the expense ratio is also a strong statistically significant regressor of brokerage commissions (β= 7.6, p<0.01) for the FE and robust FE models and an even stronger and statistically significant regressor of brokerage fees (β= 8.1, p<0.01) for both robust FE clustered models in table XXVI. The intensity of the relationship decreases considerably once the analysis switches to the BB98 methodology, in table XXVI B. The Blundell and Bond (1998) GMM methodology quantifies the relationship between management fees and brokerage fees as positive and highly statistically significant but not as economically significant (β= 0.99, p<0.001 to p<0.01). The same positive relationships between brokerage fees and expense ratios or alternatively management fees are exposed by tables IX, X, and XI dealing with my cross-sectional sample. The portion of the expense ratio that deals with marketing expenses, the **12b-1 fees**, is not a significant regressor of brokerage fees across the six models in tables XXVI and XXVI B. Confirming my results, Indro et al. (1999) show a perfect monotonic
relationship between expense ratio and turnover rates. The authors identify funds in the smallest size decile as having the highest expense ratios and turnover rates compared to funds in the largest TNA decile, in which both expense ratios and turnover rates reach their nadir. The difference in turnover is of 25 percent higher, on average, for the funds with the highest expense ratios compared to the funds with the lowest expense ratios. Expense ratios are two and a half times higher for the funds with the highest turnover rates relative to the funds with the lowest turnover ratios. Furthermore, the fact that the relationship between brokerage commissions and manager fees in my regression is stronger and more stable could be the result of the role played by mutual fund managers in regards to portfolio trading. According to Baumol et al. (1990), the primary responsibility of mutual fund managers is to conduct research and make portfolio investment decisions. Management fees are the compensation that managers receive in return for executing those trades and for the research they conduct (Baumol, Goldfeld, Gordon, & Koehn, 1990). Edelen (1999) also relates turnover to manager compensation; the author determines that better-informed mutual fund managers, engage into more strategically informed trading, which consequently could also induce positive returns and should be compensated with higher management fees. Deli (2002) also establishes a relationship between manager compensation and turnover that corroborates my findings. The author identifies a direct relationship between higher portfolio turnover and higher managerial compensation. The results obtained from my analysis, and backed up by other researchers, confirm the premise of my second hypothesis that predicts a positive relationship between brokerage fees and the rest of the mutual fund expenses. Haslem’s et al. (2008) findings largely confirm the results from this analysis and the premise from my second hypothesis. The authors are capable of identifying a strong positive relationship among all mutual fund expenses. Funds in the high expense ratio class have high front-end and deferred loads, 12b-1 fees, management fees, and turnover ratios; all mutual fund expenses move in unison; exactly the opposite effect is identified for the funds in the low or very low expense ratio categories, which account for minimum expense levels across all mutual funds. The authors believe this should encourage investors to use Morningstar or Lipper analytics to seek expense ratio information before investing (Haslem, Baker, & Smith, 2008).
Perhaps the main reason for mutual funds to keep part of their holdings in cash is for market timing considerations. First, to be able to satisfy redemptions of mutual funds shares, without having to liquidate assets at what could be inconvenient times; for example during a downturn, which is presumably when more investors are actively trying to withdraw reacting to the dismal returns. Alternatively, mutual fund managers want to keep cash available to take advantage of possible investment opportunities without having to modify a large portion of their position. Once again a down market might work as an example here, having cash available allows managers to take advantage of corrected prices and buy stocks with higher growth potential. Under both scenarios having cash facilitates trading; thus, I expect to see a positive relationship between brokerage fees and cash holdings. In my sample, the multivariate panel data methodologies employed in table XXVI, suggest that a one percent increase in cash holdings conveys a 0.11 percent increase in brokerage commissions for the FE, Newey-West robust FE, and clustered by family heteroscedastically robust FE models, with p-values ranging from $p<0.001$ to $p<0.10$. However, in table XXVI B, keeping a consistent magnitude: a one percent increase in the percentage of cash balances suggests a 0.10 percent decrease in brokerage fees in both BB98 models with p-values ranging from $p<0.01$ to $p<0.10$. This same relationship appears in tables IX, X, and XI dealing with the cross-sectional dataset. Chordia’s (1995) findings sides with my initial intuition, confirming that mutual funds that expect more redemptions tend to hoard more cash. Alternatively, he also verifies empirically that higher cash reserves do not mitigate the possibly negative effects of experiencing negative liquidity shocks. Furthermore, the author is capable of identifying a positive relationship between the need of mutual funds to hold higher cash levels and high turnover ratios. This association is even stronger for funds that combine high turnover and high redemption ratios, even though these two characteristics tend to be non-synchronous and highly independent; the composition of an entire portfolio can be completely switched in a few days while redemptions tend to be spread out more through the year (Chordia, 1996). The results in my statistical analysis are inconclusive; it could be that mutual fund managers that trade frequently tend to keep more cash in hand to increase flexibility. This situation is particularly expensive for investors; frequent trading has associated costs, which investors are required to cover and keeping
cash balances erodes the investor earning potential. It is also possible that if a mutual fund manager wants to keep cash holdings high, then he has a smaller amount of assets to use for trading and that is causing the negative relationship with brokerage fees, which appear in the BB98 models.

VI. B. iii. Panel Hypothesis III

Hypothesis III:

Mutual funds with weaker corporate governance structures in place would tend to pay higher executive compensation, controlling for other possible characteristics that influence executive salaries according to the prior financial literature.

\[ \text{Dir. Comp}_{it} = \alpha_i + \beta_1 \text{Dir. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + \epsilon_{it} \] (3)

\[ \text{Mngr. Comp}_{it} = \alpha_i + \beta_1 \text{Mngr. Comp}_{it-1} + \beta_2 \text{Fund Characteristics}_{it-1} + \beta_3 \text{Corporate Governance}_{it-1} + \epsilon_{it} \] (5)

In testing my third hypothesis that posits that funds with stronger corporate governance structures in place should present lower executive pay, controlling for other possible characteristics that the financial literature has suggested influence executive compensation, I run four regression models: standard fixed effects, heteroscedastic robust fixed effects, and two more robust fixed effects with standard errors clustered by mutual fund family and by a combination of mutual fund family and investment objective, plus two one-step on levels Blundell and Bond (1998) (BB98) generalized method of moments (GMM) estimations: standard and heteroscedastically robust. Hence, a total of six estimation models are established for mutual fund executive compensation with two focuses: independent director compensation and mutual fund manager compensation. The models include mutual fund characteristics and board of directors governance characteristics including: independent directors’ and chairmen’s traits as explanatory variables. Twelve corporate governance characteristics are included as variables of
interest in this model: number of directors, number of independent directors, number of female directors, number of funds overseen by the average independent director, directors’ fund ownership, committee meetings, Chairman of the Board (COB) age, COB tenure, COB fund ownership, dual CEO/COB status, manager tenure, and the regulation proposal variable. Largely the same variables are run across all six models, which contain mutual fund characteristics as control, variables including: fund investment objective, TNA, risk, categorical variable related to family membership, flow of funds, fund life in years, sponsor ownership, and number of other officers. The statistical models are run using the panel data hand-collected for the purpose of this dissertation, which includes over 2,800 unique year-mutual-fund individual observations over a period of 17 years, covering the years from 1998 though 2015, representing approximately 165 mutual funds per year. Statistically significant regressors are discussed below with comparisons made across regression models and across sample variations.

Table XXVII summarizes the regressions results from four different methodologies designed to clarify the relationship between director compensation and board of directors characteristics, employing a panel dataset, as discussed in hypothesis three and modeled by equation (3). The overall significance of the regression models varies quite a bit from model to model with the fixed effects F=41.65 (p< 0.001), Newey-West robust FE F=147.49 (p< 0.001), and the also heteroscedastically robust FE with standard errors clustered by family and fund F=10,463.63 (p< 0.001). The linear combination of the independent variables explains seven percent of the variance in the director compensation dependent variable. Ninety seven percent (Rho=0.97) of the variance is attributable to the difference across panels. The model satisfactorily identifies nine of the eleven corporate governance variables of interest as having statistically significant roles across several or all of the regression models; in order of their magnitude they are: number of female directors, number of independent directors, regulation flag, number of directors, COB fund ownership, COB age, dual CEO, and committee meetings. The intercept is statistically significant, and so are seven of the control variables, in order of their contribution to the variability of the director
pay: lagged director compensation, fund life, family membership, risk, flow, objective by year, and number of other officers. All control variables regardless of their significance levels exhibit the direction and magnitude that is expected judging by the results gathered in my literature review. Control and variables of interest are discussed below.

[Insert Table XXVII B here]

As noted in the introduction to the panel data, limitations in applying fixed effects regression models to panel (including unobserved heterogeneity) are addressed with the employment of dynamic panel data estimation following the Blundell and Bond’s (1998) generalized method of moments (GMM) methodology. The one-step on levels BB98 GMM approach deals with endogeneity by including lagged iterations of the dependent variable as instruments and is equipped to account for unobserved time-invariant effects. Table XXVII B includes the results from two Blundell and Bond (1998) GMM models: standard and heteroscedasticity-robust, summarizing the results from the estimation of the relationship between director compensation and governance characteristics for years 1998 through 2015 as discussed in hypothesis three and modeled by equation (3). The results vary marginally with the baseline BB98 GMM model providing a Wald $\chi^2 = 1,217.08$ ($p<0.001$) and the robust BB98 GMM estimation reaching a Wald $\chi^2 =1,303.4$ ($p<0.001$). The Arellano and Bond test for zero autocorrelation in the first-differenced errors is conducted on the robust model; the test does indicate that the model is not misspecified. Now seven of the twelve corporate governance variables of interest are significant in one or both of the GMM models. The list of seven significant corporate governance regressors in order of their contribution to the variance of director compensation is: number of independent directors, number of funds overseen by the directors, number of directors, COB age, manager tenure, committee meetings, and COB tenure. The intercept and three control variables are also significant contributors to the variance in director compensation; in order of absolute magnitude: sponsor ownership, fund life, and flow. Most control variables regardless of their significance levels exhibit the direction and magnitude that is expected
judging by the results gathered in my literature review. See below a detailed explanation of control variables and corporate governance regressors.

[Insert Table XXVIII here]

Using panel data for years 1998 through 2015, table XXVIII summarizes the results from the multivariate regression analysis on the relationship between manager compensation and Board of Directors (BOD) characteristics, as discussed in hypothesis three and modeled by equation (5), employing four different methodologies. The overall significance of the regression models varies quite a bit from regression to regression with the fixed effects $F=4.44$ ($p<0.001$), Newey-West robust FE $F=6.96$ ($p<0.001$), and the also heteroscedastically robust FE with standard errors clustered by family and investment objective $F=3,908.83$ ($p<0.001$). The linear combination of the independent variables explains seven percent of the variance in the manager compensation dependent variable. Ninety seven percent ($Rho=0.97$) of the variance is attributable to across panels’ differences. Four BOD variables of interest have statistically significant roles across several or all of the regression models; in order of their magnitude: director compensation, COB age, manager tenure, and the number of committee meetings. The intercept, and five control variables are significant; in order of their contribution to the variability of the manager pay: lagged manager compensation, regulation flag, fund life, number of other officers, and risk. All control variables regardless of their significance levels exhibit the direction and magnitude that is expected judging by the results gathered in my literature review. Statistically significant controls and variables of interest are discussed below.

[Insert Table XXVIII B here]

Table XXVIII B summarizes the results for the estimated relationship between manager compensation and governance characteristics, as discussed in my third hypothesis and modeled by equation (5), following the Blundell and Bond (1998) (BB98) generalized method of moments (GMM) approach. Table XXVIII B includes two one-step BB98 GMM estimations on levels, one of them being a
heteroscedasticity-robust model. The results vary marginally with the baseline BB98 model providing a Wald $\chi^2 = 759.37$ ($p<0.001$) and the robust BB98 reaching a Wald $\chi^2 = 1,207.64$ ($p<0.001$). The Arellano and Bond test for zero autocorrelation in first-differenced errors is conducted on the robust model; the results suggest that the model is not misspecified. Now seven corporate governance variables are significant in one or both of the GMM models. The most significant corporate governance regressors in order of their contribution to the variance of manager compensation are: number of funds overseen by the board, regulation proposal flag, dual CEO, director compensation, COB age, and committee meetings. The intercept and four control variables are also significant contributors to the variance in manager compensation. The following four are the significant control variables in order of absolute value: lagged manager compensation, objective, regulation flag, and number of other officers. Most control variables regardless of their significance levels exhibit the direction and magnitude that is expected judging by the results gathered in my literature review.

Most likely mutual fund managers’ and independent directors’ salaries are not completely determined from scratch every year; they are based on a certain set parameters that have been set in the past. Most compensation schemes have two parts: a fixed portion and an incentive-based or variable share assigned in response to performance. For independent directors and mutual fund managers the variable portion of the salary might include meeting fees, value of fund investments awarded by the fund, non-equity incentive plan compensation based on performance, contributions to pension plans, deferred compensation contribution or earnings, etc. The variable part of the salary is subject to change every year. However, the fixed portion of the salary will probably stay largely the same while reflecting adjustments for increases in the cost of living. The fixed effects models employed in this analysis have traditionally not been considered optimal to deal with processes that include lagged versions of the dependent variable among the explanatory variables because fixed effects are static (Flannery & Hankins, 2013). Dynamic panel models such as Blundell and Bond (1998) are better suited to combine past and present information in the determination of the parameters’ betas; however, compensation from the prior
year is included in all models not only on the GMM estimations. Table XXVII confirms that for all fixed
effects models the compensation received by the average independent director the year before is a
statistically significant positive regressor of the current average independent director compensation.
According to the standard and Newey-West robust FE models (\(\beta = 0.25\; p<0.001\)), the impact of the lagged
director compensation is marginally larger than what the also heteroscedastically robust FE clustered
regressions depict (\(\beta = 0.21\; p<0.01\)). Included as a control variable in table XXVIII, the one-year lagged
manager compensation is a significant positive regressor of current manager compensation according to
the standard fixed effect regression (\(\beta = 0.11, \; p<0.001\)); and the one-year lagged manager compensation
has an even stronger bond with current manager compensation in table XXVIII B under both BB98 GMM
model specifications (\(\beta = 0.53, \; p<0.001\)).

Most likely, the compensation schemes set by mutual fund families are going to be dependent
somehow in the individual mutual fund’s investment objective; perhaps because there are certain
parameters specific to investment objectives, such as maintaining a certain duration in a portfolio of
bonds or maintaining a certain risk profile in a stock mutual fund, which are going to influence the
variable portion of the manager compensation. Moreover, there are intrinsic mutual fund family
characteristics that affect director and manager compensation; for instance, whether the fund pays
meeting fees, or the amount of the supplement directors receive for serving in a committee, and even the
number of committees will determine how many of those salary supplements the board members could
receive. A categorical variable identifies each unique mutual fund family. Alternatively, trying to obtain
a deeper understanding of director and manager compensation, the statistical models implemented here
distinguish between funds with a primary investment objective of either: equity or debt. In order to keep
investment objective in the fixed effects regression, the variable is introduced as an interaction factor
resulting from multiplying investment objective by year. As noted above, fund objective is categorical
and domestic equity is used as the default value for the regression models. Changes in mutual fund
families happen mostly due to consolidations in the industry. The time variant coefficient for family
member is consistent with Khorana and Servaes' (2006) findings; the authors document extensive consolidation in the mutual fund industry, where larger players tend to integrate smaller players to obtain higher market share and higher product differentiation, measured by the number of funds offered in the family (Khorana & Servaes, 2007). In table XXVII, objective by year has an almost zero negative relationship with director compensation but it is statistically significant for the Newey-West robust fixed effects model. In regards to manager compensation, in table XXVIII B, investment objective, without the year interaction, appears to have a significant negative association with manager pay ($\beta$=−0.2, p<0.001).

Similarly, in table XXVII, family category reveals a difference on the average director compensation with respect the control group for the standard and heteroscedastically robust FE models ($\beta$=−0.06, p<0.001). Both significant parameters indicate lower pay for directors serving on bond funds. Deli’s (2002) results partly confirm mine; the author indicates that managers of mutual funds largely invested in equity receive higher compensation that mutual fund managers in charge of bond portfolios. There are several possibilities to explain this difference; one possible explanation is that equity funds are more difficult to monitor. Additionally, it is hard to determine, particularly in equity funds, if the return obtained by the portfolio manager is the result of skill or luck. Khorana (1996) shares that mutual fund boards are more forgiving of mutual fund managers’ lackluster performance for mutual funds that specialize in equity than they are for funds that are mainly invested in bonds. She interprets these findings as the result of the difficulties that boards experience when they are trying to monitor performance for equity portfolios. Similarly, Barclay et al. (1993) also believe that there are significant differences between equity mutual funds and bond mutual funds. The authors argue that equity funds’ managers can extract rents easier than bond funds’ managers, because equity funds are more difficult to monitor and have more volatile net asset values. (Barclay, Holderness, & Pontiff, 1993)

In my sample, TNA is not a significant regressor of director compensation (table XXVII). Similarly, TNA does not significantly contribute to the variance in manager funds in either my third or fourth hypothesis. However, the statistical models also include an approximation for mutual fund size in
the form of the number of qualified employees. In my analysis, I report a negative relationship between number of other officers and executive compensation. For instance, in table XXVII, as the number of other officers increases, director compensation decreases according to the Newey-West robust FE model (β=-0.005, p<0.05). Tables XXVIII and XXVIII B also note significant negative relationship between the number of other officers and manager compensation. First, the standard FE regression documents a small, almost null, negative relationship between how many other officers the fund employs and manager compensation (β=-0.003, p<0.10) from table XVIII. Moreover, both BB98 GMM models in table XVIII B, present a more substantial role for the number of other officers on manager compensation (β=-0.011, p<0.001 to p<0.01). The results suggest that fund size, as measured by the number of other officers, has a negative effect on executive compensation. In the financial literature, Khorana’s et al. (2007) findings align with mine; the authors find that board member compensation is higher in smaller funds, with better past performance, and longer managerial tenure. Alternatively, Ma et al. (2015) partly confirm my results; they proclaim fund size is negatively related to the amount of fixed salary, while it is positively related to the evaluation period of mutual fund managers. Fund size also has a positive impact on the mutual fund manager risk-taking incentives and on the beta of the mutual fund portfolio, indicating that large funds are more likely to offer performance-based compensation (Ma, Tang, & Gómez, 2015).

Following the lead of Adams and Ferreira (2008), and as stated in the variable description section, directors’ and mutual fund managers’ compensation, is expected to be positively related to mutual fund characteristics that require more intensive monitoring or a higher skill level and dedication. Therefore, risk, measured as the standard deviation of the monthly NAVs over the last year, should convey a positive relation with executive compensation. The variability of the mutual funds’ NAV reflects the vulnerability of the portfolio to changes in performance and market conditions and could also affect its flows from customers. Risk and flow also reflect the managers’ capabilities in terms of diversification and investment strategies. However, there is also a lot of unpredictable noise, which affects the fund's NAV that is outside the managers’ or director’s influence. In table XXVII, the
coefficient accompanying risk in the fixed effect regressions, controlling for other mutual fund characteristics and corporate governance factors, is small but positive under two of the specifications: standard and Newey-West robust ($\beta=0.014$, $p<0.01$ to $p<0.05$), which partly confirms my initial intuition. According to table XXVIII, the positive effects of risk on manager compensation are negligible, with a one percent increase in the standard deviation of NAV over the last 12 months projecting a 0.003 percent increase in manager compensation ($p<0.01$), as reflected by all three of heteroscedastically robust fixed effects methodologies, with and without clustered standard errors. Similarly, flow is an almost zero but significant positive regressor of director compensation (Table XXVII) with a coefficient of 0.005 ($p<0.001$ to $p<0.05$) for the standard and robust FE frameworks. In table XXVII B, flow remains very close to form in both BB98 GMM models and has a diminutive significant connection with director compensation ($\beta=0.007$, $p<0.001$ to $p<0.10$). Several other accounts from the prior financial literature confirm this positive effect that flow and risk have on compensation. Brown et al. (1996) and Chevalier and Ellison (1997) demonstrate that mutual fund managers have incentives to increase portfolio risk and volatility to maximize their pay for performance. For strategic reasons, most of the increase in risk happens during the second half of the year, usually following a period with low performance. Chevalier and Ellison (1997) reveal that performance, risk, and flow concentrate in the mutual fund industry. Although mutual fund performance is unpredictable, the authors’ results allow them to predict how investors’ flows and mutual funds’ risk react to performance. Mutual fund flows chase positive past performance, and risk follows negative past performance (Chevalier & Ellison, 1997). Following the authors’ assessments, it is reasonable that for this analysis risk and flows have opposite effects on compensation. More recently, Ma et al. (2015) reveal that mutual fund managers with higher variable compensation, relative to fix pay, tend to run portfolios with considerably more return volatility and more systematic risk with respect to their benchmark, to increase the chance of convex payoffs.

**Fund life** measures the number of years the fund has been operating since it was first created. According to table XXVII, there is a positive relationship between fund life and director compensation for
the standard and Newey-West robust FE models ($\beta=0.12$, p<0.001). The relationship is a bit smaller according to both heteroscedastically robust fixed effects regressions with clustered standard errors ($\beta=0.1$, p<0.01). The relationship between fund age and director compensation is much smaller but with a high degree of confidence for the standard and robust BB98 GMM models ($\beta=0.03$, p<0.01).

Comparatively, the linear models employed in the estimation of director compensation across the cross-sectional sample in tables XII, XIII, and XIV convey the same type of relationship. In regards to the impact of funds’ age on manager compensation, the standard FE model reflected in table XXVIII captures the only significance relationship ($\beta=-0.007$, p<0.05). Analogously, in table XVI, the same effect is observed in the regressions performed on manager compensation against the cross-sectional dataset.

Another variable that builds upon the time-series character of the data is the regulation categorical variable. This variable is intended to reflect the proposal of the so called the Mutual Fund Reform Act of 2004, which is launched in response to the multiple financial scandals affecting mutual funds that started to emerge in 2003, resulted in record fines, and proliferated even more in 2004. The 2004 securities law was intended to reinforce mutual funds corporate governance. It did not reach sufficient approval before its scheduled 2006 implementation. However, it achieved substantial recognition and triggered internal control measurements from many of the largest players in the mutual fund industry (Hurst, 2005). In my analysis, the regulation flag is a dichotomous variable that takes the value of one following the public release of the 2004 SEC Amendment to the Investment Company Act of 1940. Before 2004 it takes the value of zero. In my regressions, as reflected by table XXVII, the 2004 bill, designed to improve the governance and regulation of mutual funds, has a positive impact on directors compensation across all four fixed effects frameworks ($\beta=0.13$ to $\beta=0.15$, p<0.05 to p<0.10). In table XXVIII, this positive relationship transcends also to manager compensation, where the proposed change in legislature also has a possible positive impact on salaries as far as the standard and robust FE model depict ($\beta=0.09$, p<0.001 to p<0.05). Both Blundell and Bond’s (1998) GMM specifications from table XXVIII B capture an even stronger effect of the defunct Mutual Fund Reform Act of 2004 on managerial compensation ($\beta=0.15$, p<0.001 to p<0.05). It is possible that the increase in mutual fund compensation, following the
interjected implementation of the Mutual Fund Reform Act of 2004, is similar to increase in executive compensation from publicly traded corporation, resulting from the approval of the Sarbanes Oxley Act (SOX) of 2002. Although the 2004 law was challenged before its implementation schedule for April of 2016, it might have served its initial intent of increasing scrutiny from mutual fund boards. It is also possible that the regulation variable just captures the overall trend of salaries to increase overtime. Largely, the implementation of the SOX had a net positive impact in salaries (Cohen et al., 2004; Cianci et al. 2011). Companies responded to the additional liability on corporate executives, caused by the requisites of the new law, by reducing executives risk exposure switching them from performance-based compensation to greater fixed salary (Cohen, Dey, & Lys, 2004).

The next portion of this analysis focuses on the variables that try to capture the effect of corporate governance on compensation. As argued by Del Guercio et al. (2003) and Roiter (2016) boards of directors in mutual funds or closed-end investment funds serve a different role than boards in industrial corporations. Any board of directors is established to serve shareholders’ interests. However, mutual fund boards are not required to supervise or provide managers with advice. The Olesh v. Dreyfus Corp., 1995 WL 500491 case from the U.S. Court of Appeals for the Seventh Circuit challenged the standards that apply to the fiduciary responsibilities of mutual fund investment sponsors. The prosecutor’s arguments presented the situation as a classical example of a conflict of interests: the exorbitant salaries received by directors’ undermine their ability to make rational independent decisions defending the interests of customers that they would never meet. High paid directors, less willing to challenge sponsor’s fees, would likely engage in rent-sharing behavior. The opposing arguments, presented knowledgeable and skillful directors receiving a fair salary in exchange for diligent oversight (Tufano & Sevick, 1997). This case demonstrates how different accounts can be made from both sides regarding to the role of mutual fund boards and their compensation. Hence, one way to argue for either side of this controversy is to clarify how mutual fund corporate governance characteristics are influencing director and mutual fund manager compensation. In this analysis, the results on the variables of interest
are quite notable; all corporate governance characteristics are in some form statistically related with
director and mutual fund management, across all 12 statistical estimation models.

The controversy over the 2004 Mutual Fund Reform Act suggests that board design and the
quality of corporate governance provided by the mutual fund board of directors is a controversial topic; it
is hard to make specific recommendations regarding the ideal number of board members, board
independence, board diversity, etc. In regards to board size, smaller boards are usually considered more
efficient (Steiner, 1972). As reflected by table XXVII, an increase in the number of directors
accompanies an increase in director compensation ($\beta = 0.13, p<0.001$) in the FE and Newey-West robust
FE models. The magnitude of the regressor is slightly higher in the two heteroscedastically robust FE
clustered models ($\beta = 0.14, p<0.01$). In table XXVII B, one additional member in the board of directors is
predictive of a much larger 1.65 percent increase in director compensation for both BB98 GMM models
($p<0.001$). In this respect, Khorana’s et al. (2007) findings align with mine. They illustrate what typical
profile of the average mutual fund with higher board member compensation resembles: largely invested in
equity, with higher fund manager ownership, relatively larger boards, and longer managerial tenure. A
contemporaneous paper by Ferris and Yan (2007) also shares a small but positive relationship between
expense ratios, board size, and the unexplained portion of independent director compensation. Hence,
both research works provide support for my claims in regards to a positive relationship between board
size and director compensation, which helps to reinforce the idea that larger boards are all around more
expensive for investors. Probably the most controversial provision of the Mutual Fund Reform Act of
2004 is the requirement to increase independence in mutual fund boards to 75 percent of members and to
impose an independent chair. Requests to prove how increased independence is beneficial to investors
put the bill in jeopardy and the lack of response from the SEC sentenced it to a slow death. Contrary to
the arguments made against these requirements, tables XXVII and XXVII B show that board
independence is generally a significant negative factor in explaining director compensation. In table
XXVII, an increase in the number of independent directors bears a decrease in director compensation ($\beta=$
-0.95, p<0.001) for the FE and robust FE models. The magnitude of the regressor is slightly higher in absolute terms in the two clustered models (β= -1.16, p<0.05 to p<0.10). In table XXVII B, the magnitude of the impact that the number of independent directors has on director compensation diminishes considerably (β= -0.06, p<0.01 to p<0.05). In regards to the effect of board independence on manager compensation, CEO duality is a positive statistically significant determinant of manager compensation. According to table XXVII B, as portrayed by the standard BB98 GMM estimation the dual CEO explanatory variable, which involves an interested COB, has a positive impact on manager compensation (β= 0.09, p<0.001). Suggesting that non-independent boards are more likely to promote collusion. Aforementioned in the detailed explanation of the cross-sectional results presented in tables XII, XII and XIV, Tufano and Sevick (1997) also confirm the negative relationship between independent directors pay and board independence. Additionally, Del Guercio’s et al. (2003) findings are also on my side; the authors reveal that the most effective fund boards are characterized by: fewer members, low expense ratios, higher independence, and relatively low director compensation. Finally, in terms on board structure, the number of female directors has a similar impact on director compensation. Table XXVII, indicates that an increase in the number of women on the board is connected with a decrease in director pay (β = -1.7, p<0.001) in the FE and robust FE models, and of a slightly smaller decrease in compensation according to the robust FE regression with clustered standard errors by family and investment objective (β= -1.6, p<0.10). These results might be partly motivated by the gender pay gap. Using survey data, Farnsworth and Taylor (2006) encounter a significant pay gap among male and female portfolio managers that work in the mutual fund industry. The authors suggest that part of the differences in pay might be the consequence of a higher percentage of male investment professionals holding a CFA accreditation (Farnsworth & Taylor, 2006).

Across all regressions, two variables that are introduced as proxies for busy boards, given that intrinsically they would require a higher commitment in resources and time from boards: the number of committee meetings and the number of mutual funds overseen by directors. A positive relationship
between the number of committee meetings and director compensation is to be expected because a marginal portion of the salary of the directors might consist of meeting fees but mainly because it reflects a higher effort level. Presumably, the number of committee meetings is directly proportional to the number of committees and accordingly to the number of challenges and crucial decisions faced by the firm (PwC, 2016). According to Steven Hall & Partners (2015) it is increasingly common for most firms to stop paying meeting fees; only among small-cap firm meeting fees remain popular. In relative terms, meeting fees are increasingly becoming a smaller portion of director compensation. Large-cap companies are eliminating meeting fees entirely in favor of a higher fixed salary and more on point incentive-based compensation. Industrial corporations and mutual funds list the number of times a specific director has missed a meeting, so there are also repercussions on director’s reputation (Steven Hall & Partners, 2015).

Tables XXVII and XXVII B demonstrate that, after controlling for other variables, there is a negative relationship between director compensation and number of meetings; however, such association is almost zero. In table XXVII, for the FE and robust FE models the committee meetings variable of interest is a statistically significant and small negative regressor of director compensation ($\beta = -0.003$, $p<0.05$). The statistical significance of the connection between committee meeting and director compensation greatly increases in the BB98 GMM models of table XXVIII B, while the coefficient remains economically insignificant ($\beta = -0.008$, $p<0.05$). Correspondingly, judging by the information contained on tables XXVIII and XXVIII B, there is also a very small, almost zero, but negative relationship between the number of times the different committees convene and manager compensation. In both tables XXVIII and XXVIII B, committee meetings are a very small but statistically significant negative regressors of manager compensation ($\beta = -0.002$, $p<0.01$ to $p<0.10$); in table XXVIII the relationship is affected by model specification, and only holds for the standard and robust FE models, but not in the two clustered frameworks. Hempel and Fay (1994) are one of the first researchers to pay attention to independent director compensation. Their study follows more than 225 large corporations over a five-year period. Hempel and Fay (1994) place the number of board meetings and the size of the company as significant determinants of director compensation levels. The authors interpret these results as the consequence of
the hegemony of market-driven compensation designed to attract and retain of these directors. Tufano and Sevick (1997) and Ferris and Yan (2007) have confirmed a similar positive relationship between board meeting frequency and director compensation in their respective works. It is possible that the reason why the relationship here is not economically significant could be found in two parallel phenomena experienced by industrial corporations’ boards; while directors’ compensation continues to increase at comparatively higher rates than other executive salaries, the amount of the meeting fees and the number of corporations paying meeting fees continues to decline every year (Green & Suzuki, 2013; Nili, 2015; Steven Hall & Partners, 2015). In table XXVII B, the number of funds overseen by the average director is small, positive, but marginally statistically significant regressor of director compensation ($\beta=0.84, p<0.001$), in both one-step BB98 GMM estimations on levels. For every one additional mutual fund the independent director is asked to supervise, one accompany an almost one percent increase in director compensation. With respect to managers’ compensation, as reflected in table XXVIII B, additional funds overseen by the board also have a positive impact on salaries. In the standard BB98 GMM estimation, the number of funds overseen by independent directors has a small but statistically significant positive association with manager compensation ($\beta=0.16, p<0.001$). It seems reasonable that as the number of funds overseen by directors increase, so does director salary. However, the relationship between the number of funds overseen by directors and manager compensation requires a more elaborate explanation. Core’s et al. (1999) results partly confirm mine; the authors are capable of associating less effective corporate governance with higher CEO pay for industrial corporations. They attribute this situation to agency relationship concerns. Firms operating in environments that have more proclivities towards low transparency tend to pay higher CEO compensation. Among their main findings, Core et al. (1999) also expose CEO compensation as positively related to the number of directorships that the independent directors from the board accumulates; hence, busier independent directors tend to approve higher CEO salaries (Core, Holthausen, & Larcker, 1999). Judging by my results, and given the enormous number of boards in which mutual fund directors serve, the lack of transparency on what mutual funds actually cost to investors, and the overall obscurity in determining what constitutes the
mutual fund manager skill set, the mutual fund industry could be a potential candidate to have the weaker governance structures, greater agency problems, and overall inflated salaries suggested by Core et al. (1999).

The effect that director and COB ownership has on independent director and manager compensation is not as intuitive. The amount of mutual fund shares owned by independent directors enters the regression with a positive coefficient, after controlling for mutual fund attributes and corporate governance characteristics. In their classic paper, Jensen and Meckling (1976) illustrate a negative relationship between managers’ stock holdings and their compensation. According to the authors, the explanation for this negative relationship is that managers with higher ownership interests in their employers require less incentive-based compensation since their interests are already aligned with shareholders’ interests (Jensen & Meckling, 1976). However, a positive relationship may also occur if having the interests of directors and managers aligned with those of investors causes an increase in ownership and compensation. According to table XXVII, after controlling for other variables, there is a positive, small, and only marginally significant relationship between COB fund ownership and director compensation; such association is almost zero. The amount the COB invests in a specific fund is a significant small positive regressor of director compensation for the Newey-West robust FE model (β= 0.02, p<0.10), and is almost statistically significant at the ten percent level in the standard FE model. Similarly, from table XXVIII B, the magnitude and statistical significance of the positive relationship between the amount the COB invests on a fund and manager compensation remains largely the same in the standard BB98 GMM model (β= 0.012, p<0.10). Khorana et al. (2007) share evidence of a positive relationship between board ownership and fund manager compensation at a larger scale than what I am able to extract from my models. Additionally, they believe investors should welcome their findings, which align with mine, and take advantage of this information regarding COB and directors’ investment allocations when deciding in which mutual fund to invest (Khorana, Servaes, & Wedge, 2007).
With regards to COB and director characteristics my results are largely cohesive. The predictable outcome is a positive relationship between director or manager tenure and director or manager compensation because of the expectation that executives that are kept in their position for a longer period of time, must be performing well and that they should be compensated accordingly. However, in industries experiencing rapid salary growth that is now always the case; new appointees sometimes are hired receiving a higher salary, which is driven by market forces. The relationships between tenure or age and compensation that emerge from these regressions are small or not statistically significant. In my analysis, COB age has a significant bond with director compensation in the standard and Newey-West robust FE regressions as well as in the two BB98 GMM models, from tables XXVII and XXVII B respectively. In essence, as COB age increases, so does director compensation in the standard FE and robust FE frameworks (β= 0.012, p<0.05 to p<0.10). The positive impact of COB age on director compensation is lightly more pronounced in both BB98 GMM models contained in table XXVII B (β= 0.014, p<0.001). Similarly, COB tenure has a very small significant connection with director compensation in the BB98 GMM estimation from table XXVII B. However, the statistical model suggests that as COB tenure increases, director compensation decreases by an infinitesimal amount (β= -0.004, p<0.01). On the contrary, COB age is also a very small positive regressor of manager compensation with a wide range of confidence levels across all four FE models in table XXVIII (β= 0.006, p<0.01 to p<0.10). The importance of the COB age association with manager compensation decreases in magnitude and statistical significance in the standard BB98 GMM model from table XXVIII B (β= 0.004, p<0.10). Waelchli and Zeller (2013) provide certain insight that can help corroborate my findings. They employ a unique dataset constructed from over 1,500 surveys collected from chairmen of privately held Swiss corporations. These surveys are used to draw conclusions regarding the relationship between COB age or tenure and firm performance. The authors believe that the COB life cycle largely influence all aspects of a corporation. Older COBs’ resistance to change leaves them well positioned to largely avoid performance-based compensation contracts. Older chairs’ salaries are mostly composed of a fixed pay, which tends to be higher relative to younger COB salaries, which account for more
performance-sensitive compensation (Waelchli & Zeller, 2013). Hence, it is possible that directors and managers in mutual funds led by older COBs are also enjoying the benefits of the old regime and receiving comparatively larger salaries. Conversely, manager tenure is a small negative regressor of director compensation in the two clustered FE models from table XXVII ($\beta = -0.004$, $p<0.05$ to $p<0.10$). Similarly, manager tenure is only a small significant director compensation regressor in both BB98 GMM models from table XXVII B ($\beta = 0.01$, $p<0.05$ to $p<0.10$). Otherwise, manager tenure is also a very small negative regressor of manager compensation. An increase in manager tenure is linked to a minor but statistically significant reduction in manager compensation ($\beta = -0.003$). The level of confidence in this relationship varies from model to model in table XXVIII ranging from $p<0.05$ to $p<0.10$. There are several examples of recent works of research with results that align with mine. Khorana et al. (2007) demonstrate the same relationship between mutual fund manager tenure and board compensation. The effect is also combined with higher board ownership in the fund as mentioned in the discussion above and is possibly related to superior future performance. Ma’s et al. (2015) findings moderately confirm my results; across their sample of 5,000 mutual funds, albeit without the highest levels of statistical significance, the authors find a negative relationship between manager tenure and manager compensation. Although the manager tenure regressor in their analyses always maintains a negative coefficient the relationship reaches its highest level of significance for the sub-sample of mutual fund managers receiving performance-based compensation. Kempt et al. (2009) are largely interested in the sensitivity of mutual fund manager compensation to mutual fund performance and the role that manager tenure plays in this relationship. Their results on the effects of manager’s tenure on managers’ compensation largely confirm mine. They reiterate that the life cycle of the manager influences the performance elasticity of manager compensation; managers with longer tenures receive salaries that are less dependent on performance since a lower percentage of their salary comes from incentive-based compensation compared to their less experienced peers. The authors believe their results are driven by the desire of low-tenure managers to build a reputation and the proximity to the prospects of retirement for long-tenure managers.
VI. B. iv. Panel Hypothesis IV

Hypothesis IV:

After controlling for other influential factors, funds with higher expense ratios will tend to pay, on average, higher salaries to their executives.

\[ \text{Dir. Comp}_t = \alpha + \beta_1 \text{Dir. Comp}_{t-1} + \beta_2 \text{Fund Characteristics}_{t-1} + \beta_3 \text{Expense Ratios}_{t-1} + e_t \]  

\[ \text{Mngr. Comp}_t = \alpha + \beta_1 \text{Mngr. Comp}_{t-1} + \beta_2 \text{Fund Characteristics}_{t-1} + \beta_3 \text{Expense Ratios}_{t-1} + e_t \]  

To assess my fourth hypothesis that posits that funds with higher expense ratios will also have higher executive pay, controlling for other possible characteristics that the financial literature has suggested influence executive compensation, I test four regression models: standard fixed effects, heteroscedastic robust fixed effects, and two more robust fixed effects with clustered standard errors by mutual fund family and alternatively by mutual fund family and investment objective combined, plus two Blundell and Bond (1998) generalized method of moments (GMM) estimations: standard GMM and heteroscedasticity robust GMM examining independent director and mutual fund manager compensation. Expense variables and mutual fund characteristics are run as regressors of director compensation and manager compensation. Between five and six mutual fund expenses are included in the statistical models: the remainder of the expense ratio after excluding management fees and 12b-1 fees, management fees (except for the regression that focuses on manager compensation), 12b-1 fees, brokerage fees, soft dollar indicator, and the percentage of the mutual fund’s total assets that the portfolio manager keeps as cash. The models also include mutual fund characteristics as control variables to account for mutual funds’ traits that the prior financial literature finds relevant explaining variation is executive compensation schemes. Statistically significant regressors are discussed below with comparisons made across all regression models and across all sample variations.
Table XXIX summarizes the regressions results for the relationship between independent director compensation and six mutual fund expenses, against the background provided by a panel dataset of mutual funds for years 1998 through 2015, as discussed in hypothesis four and modeled by equation (6) across four different FE methodologies. The significance of the regression model for fixed effects is unquestionable $F=10.07$ ($p<0.001$). The linear combination of the independent variables explains three percent of the variance in the director compensation dependent variable. Eighty four percent ($Rho=0.84$) of the variance is attributable to differences across panels. Five of the six expense variables have a statistically significant role in several or all of the specifications. The list of the five expense variables in order of their magnitude is: management fees, expense ratio (excluding management and 12b-1 fees), soft dollar flag, brokerage fees, and the percentage of cash held by the portfolio manager. The intercept and all nine control variables are also significant in order of contribution: cumulative return, institutional flag, sponsor ownership flag, dead flag, regulation flag, lagged director compensation, family of funds, risk, and investment objective. Furthermore, the control variables are consistent with the prior analysis performed around the impact of corporate governance on compensation in my cross-sectional dataset and present similarities to other variables considered in the financial literature.

Table XXIX B presents the results for the estimated relationship between independent director compensation and mutual fund expenses for years 1998 through 2015 as discussed in my fourth hypothesis and modeled by equation (6), with four one-step Blundell and Bond 1998 (BB98) estimations on levels, two BB98 GMM on levels and two heteroscedasticity-robust BB98 GMM models. Two different BB98 GMM specifications are considered for each the standard and the robust models, to allow
for the inclusion of one additional lag of the dependent variable as an instrument, following the recommendation of the Arellano and Bond test. The results vary substantially with the baseline BB98 model with one lag providing a Wald $\chi^2=243.84$ (p<0.001), the baseline BB98 model with two lags presenting a Wald $\chi^2=51.97$ (p<0.001), the robust BB98 estimation with one lag reaching a Wald $\chi^2=612.69$ (p<0.001), and the robust BB98 framework with two lags generating a Wald $\chi^2=145.84$ (p<0.001). The Arellano and Bond test for zero autocorrelation in first-differenced errors is run on both robust models; the results indicate that one cannot reject no autocorrelation of order one but it is possible to reject no autocorrelation of order two. Since the model assumptions are not satisfied the first time the Arellano and Bond test is performed, is necessary to look for additional instruments. The test indicates that the model may be better fitted with an additional lag of the dependent variable used as an instrument. In essence, there is a need for a different model. Three of the six expense variables have a statistically significant role in several or all of the statistical models. The list of the three expense variables in order of their magnitude is: management fees, soft dollar flag, and brokerage fees. The intercept and all nine or ten control variables are also significant; in order of contribution: cumulative return, institutional flag, investment objective, dead flag, second lag of director compensation, regulation flag, sponsor ownership flag, lagged director compensation, family of funds, and risk. Furthermore, the control variables are consistent with the prior analysis performed around the impact of corporate governance on compensation, and share characteristics with the behavior of similar variables considered in the same context by the mutual fund financial literature revolving around fees as it is presented below.

Table XXX summarizes the regressions results for the relationship between mutual fund’s characteristics and expenses on manager compensation, using a 17-year panel data of mutual funds starting from 1998, as discussed in my fourth hypothesis and modeled by equation (8) across four
different FE methodologies. The fixed effects regression model rejects equal fixed effects across units with an F=7.45 (p< 0.001) for the standard framework and an F=11.15(p< 0.001) in the heteroscedastic robust estimation. The linear combination of the independent variables explains 0.8 percentage of the variance in manager compensation. Ninety-six percent (Rho=0.96) of the variance is attributable to differences across panels. Three of the four expense variables are statistically significant regressors of manager compensation. The list of these contributors in order of absolute magnitude is: expense ratio (excluding management and 12b-1 fees), 12b-1 fees, and the percentage of cash held by the portfolio manager. The intercept and two of the control variables are also significant in order of contribution to manager compensation: director compensation and fund life. Furthermore, the control variables are consistent with the prior analysis focused around the impact of corporate governance on compensation and similar variables considered by the financial literature as it is exposed below.

[Insert Table XXX B here]

Table XXX B presents the results for the estimated relationship between manager compensation and mutual fund expenses from 1998 to 2015 as discussed in hypothesis four and modeled by equation (8), with two Blundell and Bond 1998 (BB98) estimations: a BB98 GMM on levels and a heteroscedasticity-robust BB98 GMM model. The results vary substantially with the simple BB98 model reaching a Wald $\chi^2=557.83$ (p<0.001), and the robust BB98 presenting a Wald $\chi^2=294.31$ (p<0.001). The Arellano and Bond test for zero autocorrelation in first-differenced errors is conducted on the robust model; the results indicate that it is neither possible to reject no autocorrelation of order one nor to reject no autocorrelation of order two. Hence, there is evidence that the model may be better fitted without any lags of the dependent variable used as instruments. Two of the four expense variables, 12b-1 fees and the expense ratio (excluding management and 12b-1 fees), have statistically significant roles in the determination of managerial compensation. The intercept is not statistically significant but five of the
control variables are, in order of contribution: investment objective, lagged manager compensation, director compensation, family of funds, and fund life. Furthermore, the control variables are consistent with the prior analysis performed around the impact of corporate governance on manager compensation and show a similar behavior to comparable variables considered in the prior financial literature.

Tables XXIX and XXX include an additional variable that is different from the analysis of the dependent variable as seen before using fixed effects. The analyses include the **one-year lagged** value of alternatively **independent directors’ or mutual fund managers’ compensation**, i.e. of the dependent variable. Current salary is most likely a function of pay received in prior periods and of past observable and unobservable characteristics. Unfortunately, the fixed effects framework is not designed to include the lagged values of the dependent variable as regressors. However, when modeling salary functions it is widely a standard practice to include the compensation from previous periods. Fixed effects considers the unobservable time-invariant characteristics as static; alternative models such as Blundell and Bond (1998) GMM purposely combine past and present information allowing the individual effects to also change. In the Blundell and Bond (1998) GMM framework, by default the current value of the dependent variable is modeled using the value of the dependent variable in the previous period. In table XXIX B, as suggested by the Arellano and Bond test, two different BB98 GMM frameworks are included for both the standard and the heteroscedastically robust models, with the inclusion of one additional instrumental variable, the two-year lagged dependent variable. The results from the Arellano and Bond test for zero autocorrelation in first-differenced errors on the robust model indicate that it is possible to reject no autocorrelation of order one and also to reject no autocorrelation of order two. Hence, the model assumptions are not satisfied and it is necessary to include one additional lag of director compensation as an instrument. In my analysis reflected in table XXIX, the one-year lagged director compensation is a significant regressor of director compensation in the standard fixed effects framework. However, it is only a small but significant positive regressor of director compensation in that model specification ($\beta=0.07$, $p<0.05$). For the BB98 and robust BB98 GMM models, contained in table XXIX B, the one-year lagged director
compensation has also a positive bond with current director compensation. In the standard BB98 GMM that includes one lag of director compensation the effect is slightly smaller ($\beta=0.12$, $p<0.001$) than for both BB98 GMM frameworks, which also include a second lag of director compensation, where the effect is stronger ($\beta=0.17$, $p<0.001$ to $p<0.01$). A second lag of the dependent variable, director compensation, is included only in the last two BB98 GMM models from table XXIX B. The two-year lagged director compensation instrumental variable has also a positive bond with current director compensation under both BB98 GMM estimations ($\beta=0.24$, $p<0.001$). Similarly, as reflected by table XXX B, the one-year lagged manager compensation has a significant association with current manager compensation. For each one percent increase in last year average mutual fund manager compensation, contemporaneous manager compensation is expected to increase by 0.3 percent ($p<0.001$) for both the BB98 and robust BB98 GMM frameworks. Hence, as expected, compensation is influenced by its own past iterations.

Individual mutual funds tend to share characteristics with other funds belonging to the same investment **objective or family**. For panel data, as objective is relatively static, the control variable is multiplied by the year. As noted above, for this study fund objective identifies equity as the control group. The dummy variable takes the value of one if the fund specializes in debt otherwise the dummy is zero for fund trades mostly in equities. Families are also relatively time-invariant but there are several instances of a family acquiring a mutual fund from another sponsor or resulting in one mutual fund sponsor merging with another. In table XXIX, objective by year has an almost zero negative relationship with director compensation but it is still statistically significant for the Newey-West robust fixed effects model with standard errors clustered by fund family ($p<0.05$). However, objective by itself, without the year factor, resurges has a very significant and positive association with director compensation for the two Blundell and Bond (1998) methodologies implemented in table XXIX B. The BB98 GMM estimations assign a higher average compensation for directors monitoring mutual funds that mainly invest in the bond market as compared to funds that specializes in the equity market. In table XXIX B, the effect is a little bit stronger for both BB98 GMM iterations (standard and heteroscedastically robust) when the
model only carries one lag of director compensation as an instrumental variable ($\beta=1.4$, p<0.001 to p<0.05). For the two-lagged director compensation models, the magnitude of the coefficient is slightly smaller but remains statistically significant ($\beta=1.1$, p<0.001 – p<0.05). On the contrary, in table XXX B, investment objective remains statistically significant but now has a negative association with managerial compensation. The coefficients associate a larger pay for equity mutual fund managers compared to managers from fixed income funds ($\beta=-0.4$, p<0.001 to p<0.01). In terms of family membership and its influence on compensation, table XXIX provides evidence of differences in the average director compensation across different family groups ($\beta=-0.02$, p<0.001) for the standard and robust FE models. Similarly, table XXIX B captures the effect that family membership has on average director compensation in both of the two-lagged BB98 GMM estimations ($\beta=0.02$, p<0.001). Finally, table XXX B indicates family membership is also associated with differences on average manager compensation in both BB98 GMM frameworks ($\beta=0.04$, p<0.001 to p<0.05). In the financial literature, Deli’s (2002) results largely confirm my own. The author points that mutual fund managers in charge of equity funds tend to earn more than their counterparts who specialize in fixed income. He attributes the differences in pay between equity and bond mutual fund managers to two reasons. First, there are likely intrinsic differences in the assigned values and demands of both types of funds; since Deli (2002) focuses on closed-end funds (CEF), these differences manifest themselves on the premiums; bond CEFs tend to carry higher premiums than equity ones. He also suspects that there are differences in how the pay schemes are established for managers from either one of these two types of funds. Deli (2002) believes compensation might be skewed towards more variable pay in the equity funds. Furthermore, even if the fixed and variable portions are similar, the requirements to trigger the incentives probably are not (Deli, 2002).

According to Golec (1992) the mutual funds’ manager’s risk profile is a defining characteristic of his compensation. If the manager is risk averse, then risk will be positively related to managerial compensation. According to the author, risk averse managers in charge of riskier funds, composed of assets more systematic risk, would demand higher salaries to compensate for the higher level of
Managers’ salary is proportional size and risk of their portfolios (Golec, 1992). Golec (1996) provides empirical evidence for his 1992 theoretical model. In his findings, both of the instruments employed to measure risk, beta and the standard deviation of the monthly returns over the prior year, emerge as statistically significant and positively related to management fees. As is already presented in the analysis of director and manager compensation against corporate governance characteristics, included in tables XXVII through XXVIII B, risk is a significant regressor of director compensation. In table XXIX an increase in risk accompanies also a small increase in compensation according to only the standard fixed effects framework ($\beta = 0.01 \ p<0.01$), the variable is not statistically significant in the other three FE regression models. Furthermore risk has a significant negative connection with director compensation in table XXIX B, for only the one-lag standard BB98 GMM estimation; the proxy for risk is accompanied by a coefficient of a very similar magnitude ($\beta = -0.01 \ p<0.01$) although is not significant in the other three models. More NAV volatility might require higher monitoring effort from the board but also might be reflecting the compensation incentives in place. Elton et al. (2003) demonstrate that the wrong incentives could trigger further deviations from the benchmark listed in the prospectus, particularly for funds experiencing lackluster performance. Orphanides (1996) reaches a similar conclusion while partly confirming my results. He also focuses on the role that incentives play on risk-taking behavior by money managers in the financial industry. As expected, losers tend to take more risk in an attempt to increase their chances of receiving the variable part of the compensation. Orphanides (1996) also shares evidence of strategic timing in managers’ decisions to link their risk-taking behavior close to the date that triggers the payment of the bonus. In conclusion, volatility might require higher supervisory effort from the board but could also reflect the effect of compensation incentives in place, which might be driving the manager to take more risk in order to maximize his prospects of securing a higher salary. Alternatively, since mutual funds operate in a highly competitive environment it is possible that external pressure prompts less board monitoring because funds flow will punish underperforming funds ultimately chasing them out of the market. Such conflicting arguments might explain the lack of consistency in the direction of the coefficients and the fact that risk’s
statistical significance is sensitive to model specification.

Given the time series character of panel data, there are several variables designed to capture time-related effect of passing on these statistical models. Moreover, all the fixed effects models and the Blundell and Bond (1998) GMM estimations include yearly categorical variables reflecting how the year-specific effects affect the estimation of directors’ and mutual fund managers’ compensation. First, fund life reflects the number of years a mutual fund has been active since it was first introduced; it helps to identify older and newer funds’ relationship to executive compensation. According to table XXX, the same negative relationship, uncovered by table XXI, which deals with cross-sectional data for 2015, and confirmed by table XXVIII, which focus on governance characteristics, between fund age and manager compensation continues under the new framework. Across all four FE regressions contained in table XXX, fund life is a quantitative small negative regressor of manager compensation ($\beta = -0.006$ to $\beta = -0.007$, $p<0.01$ to $p<0.10$). The magnitude of the regression coefficient is larger in absolute terms when the framework shifts to dynamic models for table XXX B; here, both BB98 GMM estimations also confirm a negative relationship between fund age and manager compensation ($\beta = -0.014$, $p<0.001$ to $p<0.01$). The results suggest that older funds tend to pay higher salaries to their managers.

Other inter-temporal effect, the dead flag, has substituted the role of fund’s age in the director compensation model. In this framework, dead flag is a dichotomous variable that takes the value of one during the 12 months prior to the funds’ attrition. It traces the fund during the year preceding its disappearance. Usually there are several factors colluding to get a fund delisted, poor performance and shrinking assets, being the main two. To control for the effect that performance might have on fund’s attrition, cumulative performance is also added as a control variable into the models. Brown and Goetzmann’s (1995) work, which empirically proves that funds’ attrition is influenced by past performance over the last three years and triggers the inclusion of cumulative return in my models; cumulative return traces the mutual fund returns over the last 36 months. In my analysis from tables XXIX and XXIX B, the dead fund indicator is a moderate and inconclusive regressor of director
compensation, reaching statistical significant in four of the estimation models. Specifically, table XXIX suggests that during the 12 months leading to the mutual fund disappearance, directors’ salaries are comparatively higher to prior years, and undoubtedly after, according to all three Newey-West robust FE regressions ($\beta = 1.14$, $p<0.001$ to $p<0.01$). Conversely, only the one-lag standard BB98 GMM estimation captures a statistically significant relationship between director compensation and the dead fund indicator ($\beta = -0.74$, $p<0.05$), which contradicts the prior regression analyses. According to Lunde (1999) 70 percent of funds perish between their third and fifteenth year. Mutual fund managers are usually given a three-year grace period at the beginning, to reach critical mass, and derive an identity for the fund; alternatively mutual fund managers get to rest on their prior accomplishments once the fund passes its fifteen birthday. During their initial three-year period, mutual fund fees, including management fees that cover management compensation, are crucial. It is possible that other funds from the same family are subsidize these younger funds during the first few years to keep them artificially alive (Lunde, Timmermann, & Blake, 1999). The prior financial literature surrounding mutual funds has documented that the exclusion of dead funds from panel datasets makes any statistical analysis vulnerable to survivorship bias, particularly overestimating performance and flow estimations. Furthermore, it might also distort the degree of idiosyncratic risk shared by mutual funds (Blake & Timmermann, 1998).

Several researchers fear the differences in estimation coefficients might be quite substantial. The extent of the survivorship bias on several variables from studies in the mutual fund industry varies from author to author; in general most of the calculations situate the biases in performance between 0.1 and 1.4 percent per year. The estimation techniques employed vary from researcher to researcher and so does the time period or sample used, which might explain the lack of unanimity (Grinblatt & Titman, 1989; Brown & Goetzmann, 1995; Malkiel, 1995).

The next variable that builds on the time-series character of the data is the regulation categorical variable. This variable is designed to capture the announcement of the arrival of the Mutual Fund Reform Act of 2004, scheduled for 2006 implementation, which was challenged before it became law. Hurst
(2005) argues that the proposed law captures the corporate governance zeitgeist of the period, a sentiment that was already latent in the mutual fund industry. The regulation flag, as a dichotomous variable, takes the value of one following the announcement of the 2004 SEC Amendment to the Investment Company Act of 1940. Before 2004 it takes the value of zero. As reflected by table XXIX from my statistical analysis, the publication of the proposed 2004 bill has a positive impact on directors’ compensation across all four fixed effects frameworks ($\beta=0.71$, $p<0.001$ to $p<0.05$). The impact of the timely regulation dichotomous variable is not as meaningful in when it transfers to the BB98 GMM methodology illustrated in table XXIX B; now it is only significant under both two-lags Blundell and Bond’s (1998) models, standard and heteroscedastically robust, but with decimated effects ($\beta=0.23$, $p<0.05$ to $p<0.10$).

However, it is possible that the event study variable is just capitalizing on the fact that salaries for directors and executives have been increasing constantly overtime. Several director compensation articles echo a significant increase in directors’ pay in comparison to other salary levels over the last two decades (Adams & Ferreira, 2008; Farrell, Friesen, & Hersch, 2008; Brick & Chidambaram, 2010). However, there is also evidence that after a law that requires higher commitment or fiduciary responsibility is announced, such as the SOX 2002, employers have to provide executives with higher salaries, which basically work like insurance, to compensate for the extra requirements (Cohen, Dey, & Lys, 2004).

Deli (2002) suggests that where asymmetric information is rampant, such as in the machinations that drive mutual fund managers’ investment strategies, it is optimal for compensation incentives to provide a clear and strong link to the wealth of mutual funds’ customers. The same principle ought to apply to mutual fund directors’ incentives, whose work is highly unobservable by mutual fund customers. The author identifies a strong relationship between mutual fund investors’ return and independent directors’ pay; the incentives in place could involve: the fees approved, fundamental analyses on funds’ performance, risks assessments, attention to tax effects, etc. It would be easy to incorporate all of these points, important to mutual funds’ customers, by making directors’ and mutual fund managers’ compensation depend on NAV. However, as it happened in tables XII through XXI in the cross-sectional
analysis of compensation, the relationship between compensation and performance yields disappointing results. Cumulative returns over the last 36 months cast a negative effect on compensation through six estimations of director compensation across the methodologies compiled in tables XXIX and XXIX B, after controlling for the effect of other variables. Even though the board of directors is not primarily concerned with mutual funds’ returns, boards are supposed to defend mutual funds’ customers and to provide them with a valuable service. However, the statistically significant results in table XXIX paint a different picture; according to all four FE models there is a strong and highly statistically significant negative relationship between cumulative return and director compensation ($\beta=-4.83$ to $\beta=-5.34$, $p<0.001$). Analogously, in table XXIX B, both BB98 GMM frameworks, illustrates a negative relationship between cumulative return and director compensation ($\beta=-7.12$, $p<0.001$ to $p<0.10$). Hempel and Fay (1994) echo the main two changes affecting director compensation at the time: large increases in pay parallel to the increasing popularity of incentive-based compensation. The authors demonstrate that board size and the number of board meetings have a positive impact on director pay; they also establish a negative relationship between firm performance and director compensation, which aligns my findings (Hempel & Fay, 1994). Alternatively, Brick et al. (2006) focus simultaneously on CEOs’ and directors’ compensation. Their article is relative successful relating director pay with firm characteristics that require a more extensive monitoring. Furthermore, the authors’ findings coincide with mine when they trace a strong connection between poor firm performance and excessive director pay. They believe the excessive compensation emanates from classical agency problems (Brick, Palmon, & Wald, 2006). Furthermore, Farnsworth and Taylor (2006) also corroborate my results. The authors obtain 396 surveys about compensations’ schemes from mutual fund managers. The responses they collect from managers contain unsettling revelations. Mutual fund managers admit that their incentive-based compensation is more heavily weighted by the success of the mutual fund sponsor (for instance, they receive perks from creating new funds, securing new flows or new customers, etc.) than by the performance from the portfolios that they currently manage (Farnsworth & Taylor, 2006). This survey and the results on my
regression are a small testament to the lack of interest mutual fund sponsors have in delivering returns to their customers and are symptomatic of agency problems.

Two additional factors might affect the magnitude and composition of the expense ratios charged by mutual funds, their status as retail or institutional funds and the ownership structure of the fund sponsor as a publicly or privately held corporation. The institutional categorical variable, a dichotomous variable that takes the value of one if the mutual fund is only available to institutional investors, is a negative regressor of director compensation across all eight model specifications. The institutional flag is consistent in magnitude across all eight regressions, but shows variability in statistical significance. In table XXIX across all four FE regression models, director compensation decreases by approximately 1.4 percent on average when switching from a retail fund to a fund marketed to institutional investors (p<0.001 to p<0.01). This pattern remains consistent in table XXIX B for all BB98 GMM models, where institutional funds’ directors receive a salary that is between 1.3 and 2 percent lower than directors serving on retail funds’ boards (p<0.001 to p<0.10). A partial explanation for the decrease in institutional mutual funds’ board compensation might be the additional external supervision that is associated with institutional investors, which might alleviate the board obligations. It could also be that institutional investors are more strategic in their choices of mutual funds; they know what financial academics have discovered in relationship to funds’ costs and they specifically pursue funds with low expense ratios. The concept of ‘smart money’ usually applies to capital flows from institutional investors or any other market player considered knowledgeable or skillful. The coefficient on the institutional investor indicator for compensation hints towards more efficient institutional mutual funds. Several accounts confirm my findings, starting from the results on tables VII, VIII, and XIX from this same analysis conducted using the hand-collected cross-sectional sample. Additionally, Keswani and Stolin (2008) applies the concept of ‘smart money’ to a pool of mutual funds in the United Kingdom to determine whether they outperform their peers after they have been chosen by institutional investors. The authors verify a strong ‘smart money’ effect associated with purchases, not sales, of U.K. mutual funds by institutional investors
(Keswani & Stolin, 2008). Their findings partly support mine by identifying significant differences in costs and performance for mutual funds targeted by institutional investors. Comparably, Adams et al. (2013) also demonstrate that institutional investors influence all aspects of the mutual funds’ organizational structure. Institutional investments are linked to lower average expenses, which translate into lower director and mutual fund manager compensation, and presumably better performance (Adams, Mansi, & Nishikawa, 2013). The most obvious piece of evidence in favor of my findings comes from Brown (2017), who estimates a yearly $35 billion net loss to investors in excessive management fees. The author cites a historic precedent from the 1960s, unveiled by the SEC and the Wharton School of finance, which proved how mutual funds were overcharging retail customers with management fees. The 1970 amendment to the Investment Company Act of 1940 is a failed attempt to curb this situation. A follow up study by Freeman and Brown (2001) verify the same status quo; mutual fund investors are paying twice as much in management fees than public pension funds.

The last control variable, **sponsor ownership flag**, echoes Mr. John Bogle’s opinion on the status of the mutual fund industry. Mr. Bogle, Vanguard Group’s founder and retired CEO, is critical of publicly owned mutual funds, given the potentially negative consequences of self-regarding parent companies on mutual fund customers (Bogle, 2016). Sponsor ownership is a dichotomous variable that takes the value of one if the fund is a publicly traded company and zero if it is privately owned. According to table XXIX, sponsor ownership has a small negative relationship with director compensation. Table XXIX indicates that publicly held funds pay on average higher director compensation; the coefficient is largely consistent for the standard and Newey-West robust FE regressions (β= 1.26, p<0.01) and it has varying confidence levels for the two clustered FE models (β= 1.23, p<0.01 to p<0.05). This relationship suggests that mutual funds that are publicly held tend to pay higher compensation to their directors. In the financial literature, Adams et al. (2013) confirm significant differences in the incentive structures and internal control mechanisms of publicly owned sponsors compared to privately owned ones. The authors verify that salaries from publicly held fund sponsors are...
more sensitive to prior fund performance. However, despite their initial assessments they do not share the
caliber or direction of the difference, hence it is not possible to confirm if it aligns with my findings.

The federal securities laws, also known as the truth in securities law, are mostly descendants of
the Securities Act of 1933, which is enacted with two primary goals: to prevent fraud and to increase the
amount of information regarding securities, made available to investors. In compliance with the truth
in securities law, the SEC requires mutual fund to disclose all their expenses. Investors can use this
information to decide where to allocate their money, putting pressure on mutual fund boards. Mutual
fund boards serve a different role than boards from industrial corporations (Guercio, Dann, & Partch,
2003). Serving mutual fund customers’ interests mainly requires for directors to negotiate the service
contracts with the mutual fund sponsor and to reach the best possible deal for the mutual fund’s investors.
Therefore, the boards’ supervisory and advisory roles are less relevant in mutual funds. Unlike ordinary
corporations’ boards, mutual fund board efficacy is easy to quantify: it requires looking at the fees that
boards negotiate every year. Hence, the direction of relationship between mutual fund expenses, which
constitute the paradigm focus of mutual fund boards, and compensation should be useful. Managerial
compensation constitutes an expense, seeing how it interacts with the rest of mutual funds’ expenses
should be revealing. The results on the variables of interest are robust; almost in all of the 14
methodologies considered in this analysis, at least four of the five mutual funds’ expenses emerge as
statistically significant factors in director and mutual fund manager compensation.

The mutual fund expense ratio consists of: investment, management, distribution, administrative,
and marketing expenses. For the purpose of this research the expense ratio is divided in three of its
components: management fees, marketing expenses (12b-1 fees), and other expenses. The first variable
of interest considered for this analysis is this last portion of the expense ratio after management
commissions and 12b-1 fees have been subtracted. The relationship between the remaining portion of
the expense ratio and compensation is inconsistent in magnitude but undoubtedly remains negative and
largely of statistical significance across the 14 regression models. In table XXIX for all FE regressions, the remaining portion of the expense ratio is a significant regressor of director compensation. The leftover expense ratio has a substantial negative relationship with director compensation; a one percent increase in the expense variable depicts a 3.5 percent reduction in director pay (p<0.001 to p<0.10).

Next, the relationship between the leftover portion of the expense ratio and manager compensation, although inconstant in magnitude, is always negative and mostly statistically significant. In table XXX across all FE regression models, this association is multiplicative with a one percent increase in the remnant expense ratio quantifying a 7.5 percent reduction in manager compensation (p<0.001 to p<0.05). Similarly, albeit drastically smaller in absolute magnitude, the remaining portion of the expense ratio has still a consistent and statistically significant association with lower manager compensation, across both of the BB98 GMM estimations (β = -0.18; p<0.001 to p<0.01). These results mirror the ones from tables XVIII, XIX, and XXI dealing with the same pair of variables in the cross-sectional sample analysis of director compensation. Confirming my results, Ferris and Yan (2007) portray the same connection between the entire expense ratio and director compensation. The overall direction of this relationship suggests that, as Chen et al. (2008) point out, there is evidence of optimal contracting in the mutual fund industry. The SEC prohibits preferential treatment for directors in regards to the funds’ fees and loads; however, a well designed incentives system and the deferred compensation advantages, designed to increase directors’ ownership, may result on directors’ personal interests aligning with mutual fund investors’ interests.

Ding and Wermers (2012) find puzzling that so many mutual fund customers believe that active mutual fund managers generate superior returns. The hegemony of actively managed mutual funds is, according to the authors, in part explained by the notoriety that a few successful portfolio managers enjoy in the media. The authors mention that annual salaries of over five million dollars for mutual fund managers, and of well over $200,000 for independent directors, are fairly common. Given the scale of director compensation the authors entertain the possibility of entrenchment. (Ding & Wermers, 2012).
Moreover, Brown (2017) identifies abuses on management fees as unavoidable given the fact that mutual funds are captive of mutual fund sponsors, which manage and create them. Back to my analysis, the results, across all the statistical models included in tables XXIX through XXX B, show a very robust inverse relationship between independent directors’ and mutual fund manager compensation, while controlling for fund characteristics and other mutual funds expenses. Mutual fund manager compensation is by itself the second largest regressor of independent director compensation in all eight estimation frameworks. The negative relationship across all mutual fund expenses and director compensation could be the result, as presented by Brick et al. (2006), of unobserved firm incentives that align mutual fund board pay with investors’ interests and therefore a way to reward independent directors for more supervision and effort. It does not appear to be an arbitrary relationship, since directors serving on the compensation committee oversee managers’ salaries and approve management fees; hence, directors have a direct influence on the outcome. Management fees are paid to mutual fund managers in exchange for researching and developing investment strategies to run the mutual funds’ portfolios. As far as the behavior of management fees in this study, they are inversely related to director compensation. Table XXIX presents the results for the FE regressions on director compensation, a one percent increase in management fees translates into an almost four percent reduction in director compensation, according to the standard and Newey-West robust models (p<0.01). The coefficients remain relatively close, albeit, the statistical significance behaves more inconsistently, for the BB98 GMM estimation presented in table XXIX B. A one percent increase in management compensation is responsible for a 2.6 percent decrease in director compensation according to the standard one-lag BB98 GMM model (p<0.10); or alternatively, an almost three percent decrease in director compensation as presented by the standard two-lag BB98 GMM model (p<0.05). The negative relationship between manager compensation and director compensation is reciprocal. As stated not only in tables XXX and XXX B, but also in tables XXVIII and XXVIII B, director compensation is correspondingly a negative regressor of manager compensation. In the standard and robust FE models from table XXVIII, director compensation is a small and negative regressor of manager compensation (β=-0.02, p<0.001 to p<0.10). In parallel, as reflected by the standard
and robust FE models in table XXX, director compensation is a small and negative regressor of manager compensation (β = -0.05, p < 0.001 to p < 0.05). In regards to how the effects translate to a different methodology, for the standard BB98 GMM estimation in table XXVIII B, director compensation association with manager compensation remains negative (β = -0.03, p < 0.05). Simultaneously, both BB98 GMM estimations in table XXX present a larger negative relationship between director and manager compensation (β = -0.12, p < 0.01). These results largely confirm the prior analyses performed in the cross-sectional dataset, contained in tables XVII, XVIII, and XIX. As in Ding and Wermers (2012), I also expected to find entrenchment and a positive relationship between directors compensation and mutual funds’ expense ratios. Ding and Wermers (2012) lay out the argument, by presenting the jobs of mutual funds’ independent directors as very lucrative. From the author’s perspective, in order to keep their position, independent directors are more willing to collude with their funds’ sponsors and to develop a reputation for not challenging the approval of the fees submitted by the sponsors (Ding & Wermers, 2012). In conclusion, it is likely that mutual funds’ directors influence the incentives paid to portfolio managers; this association, as presented by the results in my statistical models, appears to be the consequence of the way mutual funds’ incentives are set. Hence, there is no evidence of collusion and it is possible that the mutual funds’ independent directors also benefit from lower management fees.

For the most part, the 12b-1 fees that mutual funds collect from their customers are used to pay brokers and to incentivize them to keep selling the fund. Before rule 12b-1 was passed, the typical broker got compensated with a high initial sales commission; after rule 12b-1, in addition to the initial sales commission the broker receives usually a 0.25 percent annual commission on his initial sale for as long as the investment remains in the fund. This payment in perpetuity creates a strong incentive for the broker to market the fund to new investors. The rest of the 12b-1-fee is spent in advertising, to reach new customers, and to increase awareness from existing ones in hopes to capture more inflows. Hence, 12b-1 fees are designed to grow the funds assets (Walsh, 2004). This fee has a clear consequence on mutual fund manager compensation, if the assets under management grow manager compensation also grows.
Hence, the relationship between 12b-1 fees and manager compensation should be positive. Nevertheless, perhaps echoing the results of multiple academic studies (Malhotra & McLeod, 1997; Golec, 2003; Prather, Bertin, & Henker, 2004; Meschke, 2007; Iannotta & Navone, 2012), the financial press has made a point to inform investors of the negative consequences that 12b-1 fees have on their portfolio returns. A recent article from The Wall Street Journal asserts that not only mutual funds that charge 12b-1 fees have fallen out of favor with investors, but also with the Labor Department’s new fiduciary duty advisor (Maxey, 2016). Moreover, a prior The Wall Street Journal’s article quoted Mary L. Schapiro, the first woman to be the permanent chair of the SEC between 2009 and 2012, prompting mutual funds to ‘rethink’ 12b-1 fees and questioning mutual families on whether 12b-1 fees continue to be appropriate (Zweig, 2009). If investors are as aware, as the financial press and academics, of the malice associated with 12b-1 fees, then, 12b-1 fees may cause an exodus of investors from mutual funds charging them.

Under that scenario, 12b-1 fees would have negative consequences on manager compensation. The results from my statistical analysis on the effect of 12b-1 fees on managers compensation are inconclusive and vulnerable to model specifications. In table XXX, a one percent increase in 12b-1 fees is associated with a 0.22 percent decrease in manager compensation for the standard FE regression (p<0.05) and for the Newey-West robust FE model (p<0.10). It is not a significant regressor of the robust FE regression model clustered on fund family, but it remains statistically significant for the heteroscedastically robust FE model with standard errors clustered by fund family and investment objective (β = -0.25, p<0.10) from the same table. On the contrary, according to both BB98 GMM estimations in table XXX B, a one percent increase in 12b-1 fees is connected with a 0.25 percent increase in manager compensation (p<0.001 to p<0.05). The fact that this relationship depends on model specificity reflects the controversial aspect of 12b-1 fees in the mutual fund industry.

James and Karceski (2006) look at the relationship between monitoring and performance. The authors cite having higher undisclosed costs resulting from low monitoring as one of the main reasons responsible for the deterioration in mutual funds’ performance. The authors fear that less monitoring may
expose mutual funds not only to market timing, and late trading but also to higher brokerage costs. Higher brokerage commissions emerge from ineffective trade execution and from higher soft dollar compensation (James & Karceski, 2006). In my analysis, the relationship between brokerage fees and director compensation is negative. According the FE and Newey-West robust FE models from table XXIX, brokerage fees have a small negative impact on director compensation but reach a high degree of statistical confidence (β = -0.06, p<0.001). The same small negative relationship appears in table XXIX B for the two-lagged BB98 GMM specifications with varying confidence (β = -0.04, p<0.01 to p<0.05). On the contrary, the soft dollar dichotomous variable, which identifies mutual funds employing service brokers, has a positive relationship with director compensation. As noted in table XXIX for the standard fixed effects (FE) and robust FE models, the difference in the mean director compensation for the two groups, i.e. mutual funds employing service brokers versus mutual funds using exclusively capital brokers, is approximately 0.21 percent higher for directors employed by funds benefiting from soft dollar compensation (p<0.001 to p<0.01). In table XXIX B, this difference in mean director compensation remains the same, with higher compensation paid to directors employed by funds that use service brokers, but the intensity of the discrepancy is much smaller (β = -0.06, p<0.001) and only visible in the standard one-lag BB98 GMM model. Confirming my results, Horan and Johnsen (2004) find that the premium trades with soft dollar compensation are associated to higher compensation. The authors in their final conclusions interpret such results as a confirmation that soft dollar brokerage is the solution to agency problems. The overall results align with the initial assessment behind my fourth hypothesis, they indicate that director compensation is in general higher for mutual funds that have higher hidden costs and overall less effective trading execution, as categorized by James and Karceski (2006). However, the association between brokerage fees and director compensation, which is reflected by tables XVII, XVIII and XIX for the cross-sectional sample, indicates that the incentive compass between directors and mutual fund customers is aligned and directors’ monitoring is effectively reducing mutual fund expenses.
Mutual fund managers are in charge of deciding what portion of the funds assets are going to remain in cash, this decision is largely outside of any board scrutiny. As discussed by Yan (2006), traditionally mutual funds keep cash to satisfy disbursements requests and also to have funds available to take advantage of future investments opportunities. Cash balances are beneficial to investors for these two reasons. If the fund does not need to liquidate funds in order to satisfy the requests of investors leaving the fund, the manager would not be required to cancel a position before it might be optimal to do so. Alternatively, investors might benefit for a larger upside potential if managers have capital available when they need it to take advantage of an investment opportunity. Still, investors pay fees to mutual funds to invest their money and to provide them with a steady risk-adjusted return. Hence, cash balances are a costly to investors in two ways: first, they have to pay the same fees to mutual funds for investing or holding their cash, and second, the investors are missing on the prospect of profits from the cash that is not invested. Cash holdings do not present a conundrum exclusively for mutual funds; industrial corporations also face a similar tradeoff with respect to their corporate liquidity policy. Liu and Mauer (2011) investigate the relationship between corporate liquidity policies and CEO’s compensation incentives. Their interest followed the increase in the amount of cash corporations are keeping. Back to my research, my summary statistics for the panel data, table IV, also reflect a substantial and monotonic increase in the amount of cash the average mutual fund is holding from 3.45 percent, in 1998, to more than double, 7.31 percent, by 2015. The analysis I perform in the panel data, as reflected by tables XXIX and XXX, presents a negative connection between cash holdings and director and manager compensation. In table XXIX for both the standard and the Newey-West robust FE models, the cash holdings regressor is only a small statistically significant negative regressor of director compensation ($\beta = -0.05, p<0.001$). Similarly, in table XXX, the percentage of the mutual fund that remains in cash is a small significant negative regressor of manager compensation in both the robust FE model ($\beta = -0.005, p<0.001$) and the also heteroscedastically robust FE model with clustered standard errors by family and objective ($\beta = -0.006, p<0.001$). Yan (2006) shares a similar negative relationship between compensation and cash holdings in the mutual fund industry. Liu and Mauer (2011) indicate that managers’ risk aversion and
diversification status influence the amount they hold in cash, even when this amount does not match investors’ preferences. Their findings confirm a relationship between CEOs’ incentives, which make them more willing to take risk, and cash holdings, which carry negative effects on shareholders’ value (Liu & Mauer, 2011). The relationship from their findings could appear in the mutual fund industry as well; managers with lower salaries will be willing to take more risk and therefore might want to temporary hold more cash to make bold investments; this in turn explains the reverse relationship between cash holdings and compensation. Liu and Mauer (2011) suggest limiting firms’ cash balances to the amount that is required to run operations, mutual funds’ boards could consider taking a similar approach; increasing board supervision in this area is probably necessary.

VI. B. v. Panel Data Hypothesis V

Hypothesis V:

Poor mutual fund performance, after controlling for other factors that the financial literature has found relevant explaining mutual fund return, could be linked to higher mutual fund expenses, brokerage commissions, or generous executive compensation.

\[
\text{Performance}_{it} = \alpha_i + \beta_1 \text{Comp}_{it} + \beta_2 \text{Expenses}_{it} + \beta_3 \text{FundCharact}_{it} + \beta_4 \text{CorpGovern}_{it} + e_{it} \quad (9)
\]

To assess my fifth hypothesis introduced by equation (9), which posits that poor performance, controlling for other possible characteristics that the financial literature has suggested influence performance, can be traced to mutual funds not only with higher expense ratios and higher brokerage commissions but also with higher executive pay, I run four regression models: standard fixed effects, heteroseedastically robust fixed effects, two more robust fixed effects with clustered standard errors by mutual fund family and by mutual fund family and investment objective alternatively, plus two Blundell
and Bond (1998) one-step on level generalized method of moments (GMM) estimations on levels: standard GMM and heteroscedastically robust GMM examining mutual fund return as the annual percentage change on NAV. Expense variables, corporate governance proxies, and other mutual fund characteristics are tested as regressors of mutual fund performance. Six mutual fund expenses are included in the statistical models: the remainder of the expense ratio after excluding management fees and 12b-1 fees, management fees, 12b-1 fees, brokerage fees, soft dollar flag, and the percentage of the mutual fund’s total assets that the portfolio manager keeps as cash. Twelve corporate governance characteristics are included as variables of interest in this model: number of directors, number of independent directors, number of female directors, director compensation, committee meetings, Chairman of the Board (COB) age, COB tenure, COB fund ownership, dual CEO/COB status, number of funds overseen by the COB, manager tenure, and regulation flag. The models also include mutual fund characteristics as control variables to account for mutual funds’ traits that the prior financial literature finds relevant explaining variation in mutual fund performance. The control variables included are: investment objective, TNA, risk, categorical variable related to family membership, fund age in years, sponsor ownership, categorical variable that identifies the fund during the year leading to its disappearance, and number of other officers. The six statistical models use the hand-collected panel dataset, which includes over 2,800 unique year-mutual-fund individual observations over a period of 17 years, from 1998 to 2015, representing approximately 165 mutual funds per year. Statistically significant regressors are discussed below with comparisons made across regression models and across sample variations.

[Insert Table XXXI here]

As the data used for table XXXI comes from a non-experimental panel across fund structures and years, the OLS assumptions could be violated. Therefore, four fixed effects (FE) models are tested: standard FE, heteroscedasticity-robust FE, and two more robust FE estimations one with standard errors clustered by family and a second one with standard errors clustered simultaneously by family and
investment objective. One of the limitations of FE models emerges dealing with unbalanced panel data, which may cause discrepancies in the between and within fund variation (Allison, 2009). This prompts me to run a heteroscedastically robust FE regression following the standard FE model. Then, I consider another possible limitation of my dataset, the potential for my observations to be correlated over time and across funds’ families. In order to circumvent this potential limitation I run two additional robust fixed effects clustered frameworks that accounts for potential common threads in the standard errors. The two clustered fixed effects models include one specification with standard errors clustered by sponsor and a second one with standard errors clustered by fund family and investment objective. Wooldridge (2009) suggests to always cluster standard errors at the highest possible level. However, although investment objective is of a higher rank in terms of group size, it is hard to argue that funds that belong the same family would not have more in common, at least in terms of corporate governance characteristics, than funds that share the same investment objective.

Table XXXI summarizes the regressions results for the inter-temporal effect of fund characteristics, corporate governance variables and mutual fund expenses on performance, using panel data, as discussed in my fifth hypothesis and modeled by equation (9), through four different methodologies. The standard fixed effects regression model rejects equal fixed effects across units with F=4.49 (p< 0.001). The linear combination of the independent variables explains a negligible 0.1 percent of the mutual fund performance variance. Ninety-seven percent (Rho=0.97) of the variance is attributable to differences across panels. Three of the six expense variables play a statistically significant role in several or all of the specifications. The list of the three expense variables in order of their magnitude is: the leftover expense ratio excluding management and 12b-1 fees, management fees, and the percentage of cash held by the portfolio manager. Six of the corporate governance characteristics are statistically significant, including: the regulation categorical variable, number of independent directors, number of female directors, director compensation, COB fund ownership, and COB tenure. The intercept and three control variables are also significant in order of contribution: attrition indicator, risk, and the number of
other officers working for the fund. Furthermore, the control variables are consistent with the prior analysis performed around the impact of corporate governance, compensation, and other expenses on mutual funds returns for the cross-sectional sample and with similar variables considered by the financial literature as it is presented below.

[Insert Table XXXI B here]

As noted in previous tables, limitations of fixed effects regression models, e.g. unbalanced panels, unobserved heterogeneity, lagged versions of the dependent variables being used as regressors, etc., are potentially solved with the application of Blundell and Bond’s (1998) generalized methods of moments (GMM) methodology which allows for the presence of fixed effects. Table XXXI B includes two GMM models on levels: one standard and one that is robust for heteroscedasticity. Using these two models, table XXXI B summarizes the results of the relationship between performance, components of the expense ratio, brokerage commissions, corporate governance, managers’ pay, and directors’ compensation, for years 1998 through 2015 as discussed in hypothesis five and modeled by equation (9). The baseline BB8 model provides a Wald $\chi^2 = 296.21$ (p<0.001) and the robust BB98 GMM estimation reaches a Wald $\chi^2 = 238.99$ (p<0.001). The Arellano and Bond test for zero autocorrelation in the first-differenced errors is conducted on the robust model. The test does not indicate that the model is misspecified. All but one of the six expense variables have a statistically significant role in several or all of the model specifications. The list of the five expense variables in order of their magnitude is: 12b-1 fees, the leftover expense ratio excluding management and 12b-1 fees, management fees, the soft-dollar compensation indicator, and the percentage of cash held by the portfolio manager. Now five of the corporate governance characteristics are also statistically significant, including: the regulation categorical variable, number of funds overseen by the COB, director compensation, COB fund ownership, and COB tenure. Once more, the intercept and three control variables are also significant in order of contribution: TNA, risk, and the number of other officers working for the fund. Furthermore, the control variables are consistent with the prior analysis performed around the impact of corporate governance and expenses on
performance for the cross-sectional sample and with similar variables considered in the financial literature. The contribution of all statistically significant controls and variables of interest from tables XXXI and XXXI B are outlined below.

**Total net assets** and **number of other officers** are used as control variables for fund size. In several instances in the financial literature, researchers have identified economies of scale driving down mutual funds’ costs (Golec, 1996; Malhotra and MacLeod, 1997; Tufano and Sevick, 1997; Indro et al., 1999; Deli, 2002; Walsh, 2004; Haslet et al., 2009; Iannotta and Navone, 2012; Malkiel 2013). The question remains whether these savings are passed to investors and if they see an enhancement in performance as a result. Contrariwise, as the portfolio gets larger it becomes increasingly difficult for mutual fund managers to pursue profitable strategies. Larger funds may be limited on how much they can buy of a single asset, and also they can put pressure on prices as they increase demand; their strategy might be revealed to other investors and the ‘smart money’ effect can erase potential profits (Indro et al., 1999; Prather et al., 2004; Berk and Green, 2004). Considering this possible tradeoff, Indro et al. (1999) demonstrate that the relationship between performance and mutual fund size or alternatively between fees and mutual fund size is not linear but it resembles a capital U (Indro, Jiang, Hu, & Lee, 1999). According to table XXXI B from my analysis, the relationship between mutual fund size and performance is negative. In this thesis, mutual funds’ size is past the inflection point, following Indro’s et al. (1999) findings; as seen on table IV, the panel data descriptive statistics, the average fund in my sample has TNA of $1.174 billions, which is above the average TNA for the industry according to the Investment Company Institute, which places it around $1.644 billions in 2015 (Investment Company Institute, 2016). In table XXXI B, both Blundell and Bond (1998) generalized method of moments (GMM) frameworks, identify that TNA has a small negative relation with mutual fund return ($\beta = -0.05, p<0.10$). Similarly, also in table XXXI B, as presented by both Blundell and Bond (1998) generalized method of moments (GMM) estimations, the number of other officers has a small negative impact on performance, albeit reaching a higher statistical resonance with even smaller magnitude ($\beta = -0.014, p<0.01$). Moreover,
according to table XXII (the cross-sectional regression of mutual fund performance for the year 2015 against fund characteristics, expenses, and corporate governance proxies), there is also a significant small negative relationship between TNA and performance. Comparably, there are multiple examples in the prior financial literature to corroborate my results (Jensen, 1993; Edelen et al., 2002; Chen et al., 2004; Bhojraj et al., 2012) finding fund size to be a deterrent of mutual fund performance. Motivated by this controversial relationship between mutual fund size and performance, Zhao (2004) investigates the reasons and consequences of mutual funds closing to new investors. Indro et al. (1999) also echo this phenomenon as a motivation for their work on mutual fund size. According to Zhao (2004), the most commonly cited reason provided by sponsors to close a mutual fund is that the mutual fund has gotten too big to be managed efficiently. However, the author suspects that there are be other considerations to proclaim that a fund has been closed to new investors. Following mutual funds closings, there is an increase in the attention level that the closed fund receives from investors and as a consequence there is a flow spillover effect directed to other funds from the same family (Zhao, 2004). Hence, it is not clear to what caliber mutual fund size is a burden to performance.

**Risk**, measured by the funds’ NAV standard deviation, is significant in five of the six estimation models when regressed against the mutual funds’ performance, at various degrees of statistical significance. Risk maintains its negative sign in all models, even in the heteroscedastically robust Blundell and Bond (1998) GMM estimation, the only one that does not emerge as significant. The prior financial literature has suggested that it is possible that the common link between negative returns and increased risk could be traced to the importance of the variable portion of mutual fund managers’ compensation (Brown, Harlow, & Starks, 1996; Orphanides, 1996; Khorana, 2001; Switzer & Huang, 2007; Kempf, Ruenzi, & Thiele, 2009; Ma, Tang, & Gómez, 2015). As reflected by the output populating tables XXXI and XXXI B, TNA volatility is a significant albeit small negative regressor of mutual fund performance. In table XXXI for all the FE models, risk casts a negative effect on performance ($\beta = -0.02, p<0.05$). However, for the two BB98 GMM estimations the effect is considerably
smaller and completely escapes significance in the robust model (β = -0.01, p<0.01). The same negative association between risk and performance, without a necessary link to incentive-based compensation, has also appeared multiple times in the prior financial literature (Malhotra & McLeod, 1997; Tufano & Sevick, 1997; Chevalier & Ellison, 1997; Elton, Gruber, & Blake, 2003; Prather, Bertin, & Henker, 2004; Haslem, Baker, & Smith, 2008; Kinnel, 2010). Risk having a negative impact on return could be considered additional proof of market efficiency; this realization combined with the stylized fact that most of the cited authors demonstrate zero or sub-zero alphas are prevalent in the mutual fund industry, suggest that mutual fund managers are not delivering in their role as professional portfolio managers after subtracting the mutual fund expenses used to pay them, and that active investment is inefficient from an economic perspective.

Brown et al. (1996) present a Darwinian view of mutual fund industry. The authors believe there are only a specific number of investors who have a limited amount of capital to invest. They explain how the mutual fund industry works using the metaphor of medieval tournament. As in a chivalry battle, mutual fund managers have to compete against each other; the prevailing managers, i.e. the best performers, are awarded with the prize of receiving or keeping the mutual fund customers’ money (Brown, Harlow, & Starks, 1996). **Fund survival** rates have been linked to past performance and mutual fund flows in the past. Brown and Goeztmann (1995) identify how mutual fund performance influences the chances of fund survival for as long as three years. The importance of mutual funds ‘survival and the distortionary effects that ignoring the disappeared mutual funds have on aggregate mutual funds’ measurements, such as risk and return, have also been documented extensively. However, up until a recent comprehensive study by Cogneau and Hübner (2015), the determinants and possible consequences of funds’ disappearances might have not been fully exposed. The authors test multitude of return and risk measurements trying to find the best regressors of mutual funds’ deaths. They conclude that the Sharpe ratio over a three-year period is the most accurate predictor of a mutual fund’s last 12 months (Cogneau & Hübner, 2015). In my analysis from table XXXI, the dead fund variable is a negative relatively small but
significant regressor of mutual fund performance. In table XXXI, the funds’ attrition indicator only carries a small statistically significant negative relationship with return for both Newey-West robust FE regression models with clustered standard errors ($\beta = -0.5$, $p<0.001$). Cogneau and Hübner (2015) comprehensive study on mutual funds’ attrition identifies that past performance influences investors’ perception of funds and their willingness to invest in them. More interestingly, they also find that lackluster past performance not only is a very strong indicator of a fund possibly shutting down soon but also is the best predictor of future poor performance. Other authors have also confirmed the inevitable results between poor performance and fund withdrawal that appear in my regression analysis (Grinblatt & Titman, 1989; Brown & Goetzmann, 1995; Malkiel, 1995; Elton, Gruber, & Blake, 1996; Blake & Timmermann, 1998; Khorana, 2001).

The classical Malkiel (1995) study of mutual fund performance between 1971 and 1991 demonstrates that mutual fund managers underperform with respect to their self-reported benchmarks even before subtracting expenses, with disastrous results once the costs of managing and operating the funds are applied. Mutual fund fees are receiving a lot of attention from the popular financial press; several articles appeared over the last few months in The Wall Street Journal, Financial Times, Forbes, etc.: asking customers to reconsider the amount of fees they are paying by looking at their total charges as a portion of the actual return the fund brings above the benchmark (Coumiananos, 2016), lecturing investors on the importance of identifying the different types of class shares and the enormous disparity in price and long term return that they carry (Hauptman, 2016), presenting a revolutionary type of fees (recently approved by the SEC) that allows investors to negotiate their mutual fund fees directly with the broker that sell them the funds (Zweig, 2017a), warning investors about brokerage fees and the other hidden costs of actively managed funds (Zweig, 2017b), etc. In the financial literature, mutual fund fees are also causing a stir: Freeman et al. (2008) find management fees excessive and the result of endemic agency problems and captive boards, Adams et al. (2012) believe mutual fund fees are disproportional and the consequence of weak governance structure, Dvorak and Norbu (2013) uphold that mutual fund
sponsors, who are knowingly presented with a possible conflict of interest, leave customers unprotected. Given the bad reputation that transcends mutual funds and mutual funds’ fees this portion of the analysis of performance determinants focuses on the latter. Ferris and Yan (2007) suggest that mutual fund boards are aware of how important mutual fund expense ratios are for mutual funds’ flows. Investors vote with their money, if investors are sensitive to mutual fund costs they will redeem their shares in response to higher expense ratio or lackluster performance. This clientele effect forces mutual fund boards to pay attention to expenses. Therefore, the influence of boards on expenses comes from internal oversight and external pressure (Ferris & Yan, 2007). Back to my analysis, understandably, the remainder of the expense ratio after removing management fees and 12b-1 fees has a negative impact on mutual fund performance. According to the standard FE model from table XXXI, a one percent increase in the leftover expense ratio has a multiplicative effect reducing performance by over three percent (β= -3.14, p<0.10). Furthermore, in both BB98 GMM estimations from table XXXI B, the effect on the remaining expense ratio remains economically and statistical relevant, with a one percent increase in the leftover expense ratio reducing performance by 1.33 percent (p<0.05 to p<0.10). Most researchers would agree that mutual fund customers should not expect to gain much from the remainder of the expense ratio; the average investor derives no value from paying the fund for the necessary clerical and operational work. For instance, Golec (1996) urges investors to pursue funds with low administrative expenses but with high management fees. According to the author, in a well functioning labor market high salaries attract talent (Golec, 1996). Also in favor of higher mutual fund expenses and active management, the classic Grinblatt and Titman’s (1998) article is capable of identifying a few successful managers; the authors locate a small number of funds with abnormal positive risk-adjusted return for the period between 1975 and 1984. More recently Porter and Trifts (2014) are also capable to identify mutual fund manager ‘merit’, defined as superior risk-adjusted performance compared to the manager’s peers in the same investment objective. Mutual fund managers lacking ‘merit’ underperform their benchmarks and lose their jobs. If they are not the worst performers, mutual fund managers retain their job and extend their tenure. However, manager tenure does not guarantee outperformance except for a very selective group of
managers, who earn their keep. Hence, the effect of management fees on performance could be ambiguous if higher fees can attract merit (Porter & Trifts, 2014). In the analysis performed on my panel dataset, management fees are a small negative regressor of performance. In table XXXI, management fees is the only expense variable of interest that surfaces as a statistically significant regressor of performance; across all four fixed effects regression models, albeit at various confidence levels ($\beta = -0.17, p<0.001$ to $p<0.10$). The magnitude of the relationship surprisingly coincides with the BB98 GMM estimations from table XXXI B, while reaching the highest confidence level ($\beta = -0.17, p<0.001$).

Reinker and Tower’s (2004) initial findings contradict mine, the authors determine that manager fees outweigh their cost and create value for investors. The authors’ assessments result from comparing Vanguard’s index funds’ returns with the returns from same sponsors’ actively managed U.S. funds, from 1977 through 2003; they assert that the actively managed funds outperform the passively managed index funds. The authors zero in on Vanguard’s actively managed funds because they are well known for having among the lowest mutual fund costs in the industry (Reinker & Tower, 2004). However, they revisit their initial results a year later. Reinker and Tower (2005) expose that Vanguard’s actively managed mutual funds are heavily invested in small and value stocks. Their initial assessment of fund returns is not properly risk-adjusted to account for the increase in risk derived from differences in investment style that the actively managed funds carry. The authors review their initial conclusions and assert that once the actively managed funds’ risk have been adjusted for style, Vanguard’s index funds surpass their actively managed counterparts in risk-adjusted returns (Reinker & Tower, 2005). Similar controversies on the effects that 12b-1 fees have on mutual fund performance also appear in the mutual fund literature. Delva and Olson (1998) find that mutual funds charging their customers 12b-1 fees actually outperform their peers that are not changing the marketing fees, once their returns are adjusted by the amount of risk but before expenses. The authors share how funds charging 12b-1 fees tend to have higher expense ratios, while funds with front loads are among the funds with the worst performance but lowest expense ratios (Delva & Olson, 1998). In my panel data sample, the impact of the marketing expenses on performance is very strong although it is only endorsed by the BB98 GMM methodologies.
included in table XXXI B. A one percent increase in 12b-1 fees conveys a 1.35 percent decrease in performance (p<0.01). My results confirm the majority of the research that has been conducted in regards to the effect that the 12b-1 rule has on mutual fund performance. Delva and Olson (1998) find that despite the superior performance demonstrated by funds that charge 12b-1 fees, their results net of fees are disappointing for investors. Jain and Wu (2000) and Walsh (2004) find that 12b-1 fees are successful at their goal; mutual funds that rely on advertising and marketing fueled by 12b-1 fees create a spider web, they lure more investors into the fund, only to provide them with poor performance. A similar negative relationship is present in the regression of my cross-sectional sample and appears in tables XXII and XXIII; analogously, multiple researchers have shared similar results and remarks in the past (Ferris & Chance, 1987; Malhotra & McLeod, 1997; Prather, Bertin, & Henker, 2004; Walsh, 2004; Iannotta & Navone, 2012; Edelen, Evans, & Kadlec, 2013). Walsh (2004) also illustrates that compared to index funds, mutual funds charging 12b-1 fees, present higher turnover rates, experience higher volatility, are more expensive and perform worse. Summarized in tables XXXI and XXXI B, brokerage commissions are not a statistically significant regressor of performance but the dichotomous variable that identifies mutual funds channeling their transactions through service brokers, i.e. receiving soft-dollar compensation, has a statistically significant effect on mutual fund returns. Table XXXI B, aligns both BB98 GMM estimators to suggest an average drop in performance for mutual funds’ managers that are employing service brokers to execute their trades (β = -0.1, p<0.10). On the contrary, Horan and Johnsen (2004) find the effect of soft dollar compensation on performance is positive. The authors actually do not use soft dollar brokerage commissions’ information like the one hand-collected for my study; instead, they devise an approximation for soft-dollar compensation that they call Premium Commissions per Managed Dollar (PCMD). PCMD is computed by taking the mutual fund industry’s average premium commission rate multiplying it by the industry’s average usage of service brokers and then multiplying this product again by the individual fund’s annual turnover rate. The authors challenge the belief that soft dollar compensation is a hidden cost to investors and another opportunity for mutual fund managers to misappropriate the funds’ resources. They argue that soft dollar brokers offer a valuable mechanism for
managers to identified mispriced securities from a source closer to the market. Additionally, it also limits the potential leakage of insider information regarding to the type of transactions or strategies the fund pursues (Horan & Johnsen, 2004). Finally, the last mutual fund expense in this analysis is the mutual fund **cash holdings**. The percentage of cash that the mutual fund keeps as part of its portfolio is also a negative indicator of return. In table XXXI, the Newey-West robust FE model represents a small negative association between the amount the mutual fund manager keeps in cash and performance ($\beta = -0.03, p<0.05$). The two BB98 GMM estimations, from table XXXI B, capture cash balances having a more significant negative influence on portfolio returns ($\beta = -0.03, p<0.01$). Aforementioned, in the financial literature, Liu and Mauer (2011) present the tradeoffs affecting corporate liquidity policies in industrial corporations and the lack of supervision this management decision enjoys. The authors prompt industrial corporation boards to impose limits on cash balances, to the minimum amount required to cover the firm’s operations (Liu & Mauer, 2011). Recent regulation enacted by the SEC will force mutual funds’ boards to implement cash management plans. Cash management plans must ensure that mutual funds’ customers have access to their funds more rapidly. Concerns on funds accessibility are raised particularly during market downturns; currently mutual funds have up to seven days to return investors their cash (Michaels, 2015). Judging by the results presented here the effect of cash balances is a dead weight for investors. By most accounts, the prior financial literature has sided with my results in terms of the impacts that cash holdings have on mutual fund investors. The effect is particularly negative for funds that are experiencing a buoyant performance, although mutual funds’ customers’ redemptions make it necessary to keep a certain level of cash. Given what is known about the behavior of mutual fund customers and how flow chases performance, it is possible to minimize the negative impact of cash holdings since funds that are performing well, will tend to incur in less redemptions and therefore can minimize the amount that they keep in cash (Chordia, 1996; Malhotra & McLeod, 1997; Yan, 2006; O’Rielly & Preisano, 2010; Bernicke, 2011; Adams, Mansi, & Nishikawa, 2012). In a more general sense, Haslem et al. (2008) also confirm my results. The authors, using a similar number of domestic U.S actively managed mutual funds to mine, find expense ratios are the best predictor of fund performance,
with funds at the lowest expense level outperforming all the other ones. More precisely, the authors are able to pinpoint that only the actively managed mutual funds with expense ratios two standard deviations below the mean have a 50 percent chance of outperforming their benchmark (Haslem, Baker, & Smith, 2008). John C. Bogle summarizes the overall effect of mutual fund fees on performance by comparing the way the mutual fund industry works with how casinos operate. In both cases the basic setup is a zero-sum game, once the mutual fund commissions are taken or the croupiers’ share are subtracted, then it becomes a loser’s game for all players (Bogle, 2009).

The core principles of mutual fund regulation derive from the Investment Company Act of 1940. Mainly it promotes transparency: it requires mutual funds to provide information to customers and prospective investors, including daily valuation and the expenses associated with fund ownership. Alternatively, the 1940’s Act requires funds to maintain liquid assets and to offer redemptions to customers in less than seven days; funds’ customers must be able to sell their shares back to the sponsor on any given day at the NAV. It also imposes strict limits on the amount of leverage a fund can carry to avoid the possibility of a fund’s liabilities exceeding the value of its assets. Finally, the Investment Company Act of 1940 requires all funds to ensure a proper delineation and separation of the assets that are under the funds’ custody from assets owned by the funds’ sponsors; moreover, it prohibits the fund to transact with affiliate organizations if such interactions may raise conflicts of interest. The stalled Mutual Fund Reform Act of 2004 intended to deliver in many of the initial core principles. It would have increased the level of information mutual funds share with investors with standardized disclosure not only for expense ratios, costs structures, and manager compensation but also for brokerage commissions and additional transaction costs. It would have banned 12b-1 fees, soft dollar arrangements, short-term trading, and the joint management of mutual funds and hedge funds. It would have reduced conflicts of interests or at least increase board neutrality. Finally, it would have also required from increasingly independent boards to adopt a code of ethics, and to state their fiduciary duty to act in the best interests of mutual fund customers (Mutual Fund Reform Act, 2004). The timing of the Mutual Fund Reform Act of
2004 appears right, it followed the perfect storm, which begins in 2003 with revelations of mutual funds’ improper pricing, late trading, questionable soft-dollar arrangements, unjustifiable manager compensation, poor governance structures, and ever raising mutual fund fees (Tkac, 2004). In my statistical analysis, the indicator for the 2004 regulation proposal has a positive effect on mutual fund performance. Table XXXI presents the 2004 regulation flag as a factor contributing to mutual fund performance in the standard FE regression, where the average mutual fund performance after the 2004 proposal is approximately two percent higher than before ($\beta = 2.05$, $p<0.001$). Table XXXI B resurrects the effect of the announcement of the Mutual Fund Reform Act of 2004, describing a positive effect on mutual fund performance that credits the funds in the post-announcement period with a higher average performance of 0.4 ($\beta = 0.41$, $p<0.001$ to $p<0.01$). Brown (2016) believes that investors are increasingly aware of the mutual funds culprits post-2004 and the abandonment of the Mutual Fund Reform Act. However, assets under mutual funds’ management have doubled, a similar effort to repeal the 12b-1 rule in 2010 also failed, and the ‘siphoning and skimming’ practiced by mutual funds have continued (Brown S. L., 2017).

The previous literature echoes the defining effects that mutual funds’ board composition has on the funds’ valuation. Board characteristic have also increased their public profile since the attempt in 2004 to enact new SEC regulation in favor of independence. A recent series of articles in The Wall Street Journal, The New York Times, and Bloomberg, focus on the role of mutual fund boards: effectively keeping up with the promises the funds make in the prospectus (Sterngold, 2012), taking a more active role defending customers interests to prevent an investor run (Michaels, 2015), or effectively turning around companies from the inside for the better (Benoit & Grind, 2015). In the academic realm, most articles cite the seminal Sevick and Tufano’s (1997) paper on board independence, which underlines the important role outside directors play reducing fees and enhancing performance. Khorana el al. (2007) and Ding and Wermers (2012) identify independent boards’ strong lack of tolerance for mutual fund manager underperformance. However, Ferris and Yan (2006) find board independence has largely no relevance.
avoiding a financial scandal or litigation from regulators or shareholders. Nevertheless, the three board characteristics chosen in this multivariate model: number of directors, board independence, and gender diversity are largely statistically significant. Board independence has a negative impact on mutual fund performance according to the results from my statistical analysis, while gender diversity on the board of directors has the opposite effect. According to the results from the standard FE regression model contained in table XXXI, one additional independent director reduces mutual fund performance by 2.12 percent (p<0.01). On the contrary, in the Newey-West robust FE framework from the same table, an additional woman in the board is accompanied by an increase in mutual fund return of almost one percent (β = 0.81, p<0.05). The results on my prior regressions focusing on performance framed within cross-sectional data, enclosed in table XXIII, second the findings presented here. In regards to industrial corporations, not mutual funds, Bhagat and Bolton (2008) and Brick and Chidambaran (2010) also establish a negative relationship between firm performance and board independence. One possible explanation for this negative relationship is the lack of board efficacy caused by the added difficulty of independent directors to get an understanding of how funds are managed internally and the effort required from outside directors to catch up if they want to serve investors properly. Also aligning with my results, Fenwick and Neil (2001) use an experimental setting to verify that teams with more gender diversity tend to outperform their peers in multiple tasks and problem solving. Similarly, concentrated on the corporations listed in the S&P 500, Carter et al. (2007) finds that only about 20 percent of the prime 500 industrial corporations have female representation in their boards. However, the approximately 100 corporations experience a very large performance enhancement, return on investment is two thirds higher for firms with mixed gender boards compared the firms with all male boards (Carter, Joy, Wagner, & Narayanan, 2007). It is prudent to consider the relationship between board’s independence and gender diversity informative but not necessarily of causal nature. It is possible that mutual funds with more independent boards have more difficulties because for most people it is easier to work in groups of people who are in similar environments and with whom with they are most familiar. Similarly, it is possible that
performance increases justifies hiring more directors and that changes in the labor market makes easier for those new board members to be women; Eagly (2016) and Elsesser (2016) share the same concerns.

Waelchli and Zeller (2013) highlight the role of chairmen of the board in corporations. They identify the main tasks assigned to the chairman of any corporation: the overall strategy of the company, and the selection, monitoring, and removal of management. The authors share mixed results in terms of how several chairman characteristics may influence firm performance. Nevertheless, they believe their results verify the important role chairmen play in a firm. Their decisive role prioritizes securing effective corporate governance structures and leading the board to fulfill its fiduciary responsibilities (Waelchli & Zeller, 2013). According to Hurst (2005), in mutual funds the role of the COB is potentially divisive; it resides at the core of the conflict of interests that define the mutual fund industry: between maximizing the sponsors’ profits and maximizing the mutual fund customers’ returns. Furthermore, the chairperson gets to nominate and elect most of the directors in the board, even the ones considered independent (Hurst, 2005). Three chairmen related characteristics emerge as relevant performance determinants in my panel data sample: COB tenure, the level of chair ownership, and the number of funds overseen by the chairperson. COB tenure, which tracks the number of years that the executive has served in the fund, is a positive significant indicator of performance in all the statistical models. Comparably, the ownership variable, constructed for this study using the investment ranges reported in the SAI, has a compatible positive relationship with performance. Finally, number of funds overseen by the COB suggests a negative link between busy COBs and performance. Nevertheless, tenure is not a large indicator of performance; in all three Newey-West robust FE methodologies from table XXXI, the number of years the COB has served in the fund affects performance positively (β = 0.02, p<0.05). COB tenure is also significant in both BB98 GMM models from table XXXI B; COB tenure in connection with fund performance has clearly a higher explanatory power than in the original FE regressions (β = 0.01, p<0.001). A recent article in The Wall Street Journal highlights mutual fund boards’ longevity and questions directors’ capabilities in an ever-changing legal environment and an increasingly competitive
mutual fund industry (Krouse, 2016). Gibbons and Murphy (1992) and Waelchli and Zeller (2013) expose a somewhat negative relationship between managers’ or COBs’ tenure and firm performance, which they associate with the difficulties firms face incentivizing older executives, who are not concerned with reputation and are close to retirement. Meschke’s (2007) outcomes regarding mutual funds are the exact opposite to the two articles just cited, and therefore align with my results. The author uncovers how fund performance relates to internal monitoring and oversight, which he is able to trace to board independence, low excess director compensation, and longer average tenure. My analysis performed on the cross-sectional data, contained in tables XXI, XXIII, and XXIV, reflects the same relationship between performance and COB tenure for all sub-samples.

In the financial literature, the amount of executive ownership oscillates between the idyllic interest alignment area and the threatening entrenchment territory. My next chair characteristic deals with COB ownership. Industrial corporations report the exact dollar amounts hold by their executives. On the contrary, mutual funds only disclose COB investment interests using dollar ranges. The SEC presumes that dollar ranges are indicative enough of how engaged COBs are with the funds customers’ interests. The heteroscedastically robust BB98 GMM estimation, summarized in table XXI B, reflects a positive relationship between COB ownership and mutual fund performance ($\beta = 0.02, p<0.05$); suggesting that either COBs are better at picking mutual funds, or that they negotiate lower fees for the funds in which they invest. My results on the cross-sectional regressions from tables XXII, XXIII, and XXIV corroborate the same connection between COB ownership and performance. Similarly, in many instances, the prior corporate financial literature has confirmed a positive relationship between director ownership and firm performance (Morck, Shleifer, and Vishny, 1988; McConnell and Servaes, 1990; Hermalim and Weisbach, 1991; Bebchuk, Cohen, and Ferrell, 2004; Bhagat and Bolton, 2008). Correspondingly, in the realm of the mutual fund financial literature, several authors who preceded this study reached similar conclusions. First, Chen et al. (2008) and Cremers et al. (2009) also confirm that high board ownership is related to lower expense ratios and higher mutual fund performance, suggesting a
conflict of interest. Next, Khorana et al. (2007) and Kinnel (2008) identify that although only a small percentage of mutual fund managers invest into their own portfolios; investors should pay attention to these funds because they tend to have lower expense ratios and achieve better future risk-adjusted performance, perhaps hinting towards inside information. Finally, Dvorak and Norbu (2013) demonstrate that mutual fund companies that offer funds from competitors to its own employees tend to do so when the other mutual fund companies offer funds with better corporate governance scores and lower expense ratios. The authors present this as proof of mutual fund companies’ interests not being aligned with their customers (Dvorak & Norbu, 2013). This provides evidence that COBs and mutual funds’ investors vote with their money by investing when they approve of a mutual fund’s performance or expense policies; COBs are also casting a vote of confidence when they decide where to place their investments within the fund family that they serve. Furthermore, COBs are more knowledgeable of the plethora of mutual fund options most sponsors offer so it is very revealing to see any traceability on the kind of investments they are making.

For the last of the COB characteristics the focus turns into the number of board appointments held by the chair. COBs who serve in large fund sponsors usually sit on many boards and attract multiple appointments. If agency conflicts between mutual fund sponsors and their customers affect fund performance, one might expect performance among funds to vary with the degree of board monitoring. Since the level of board monitoring is not directly observable, two potential proxies are considered: the number of committee meetings, and the number of funds overseen by the COB. The premise is that oversight tends to be lower for boards supervising many funds and with a low number of committee meetings. However, Ferris et al. (2003) debunk this intuition; the authors share that in regular corporations, the number of positions held by a director of the board has a positive effect on firm performance, and as a consequence the same directors from successful firms tend to attract even more directorships. Nevertheless, in my statistical analysis, there is a negative association between the number of chair positions an executive holds and mutual fund performance. Summarized by table XXXI B,
according to both BB98 GMM estimations, the number of mutual funds overseen by the chairperson has a small negative impact on performance ($\beta = -0.014$, p<0.01); suggesting that busy chairmen are less capable of ensuring mutual funds customers are properly served. According to my findings, intense board activity, measured by the number of appointments carried by the COB, is a relevant and negative performance attribute. Fich and Shivdasani (2006) confirm my results; according to the authors, firms with boards composed by a majority of directors that serve in three or more boards have weak corporate governance structures in place. Weak corporate governance manifests itself in low market value, lack of profitability and the inability of the firm to hold executives accountable for their lack of performance (Fich & Shivdasani, 2006). An obvious implication of these results is that COBs that hold many positions are less likely to perform their duties in accordance with shareholders’ interests, likely approving higher expense ratios and eroding mutual funds’ returns for their customers.

Finally, the relationship between director compensation and mutual fund performance is not so straightforward. As it is the case in most topics related to corporate governance, there is not a unanimous position coming the prior financial literature. Hempel and Fay (1994) are one of the first researchers to pay attention to independent director compensation. Their study follows more than 225 large corporations over a five-year period. Hempel and Fay’s (1994) results indicate that the number of board meetings and the size of the company are two major determinants of independent director compensation; meanwhile performance and CEO remuneration have no influence in director pay. The authors interpret these findings as evidence that market-driven compensation systems are the dominant form used by large organizations to pay independent directors, with a major focus on attracting and retaining these directors. Brick et al. (2006), also centered on regular corporations, establish a significant positive relationship between CEO compensation and director pay, controlling for firm characteristics that would result in more board monitoring. Furthermore, the authors find a direct relationship between poor firm performance and CEOs’ and directors’ compensation, suggesting the existence of collusion. Their article claim directors and CEOs are overpaid and their high salaries are not the result of market forces, skill, or
effort. Executive overpay intensifies the agency problems that should be the directors' main concern (Brick, Palmon, & Wald, 2006). Khorana et al. (2007) also finds that future risk-adjusted performance is positively related to higher board member compensation, proposing that director compensation has desirable incentive-alignment attributes for directors and mutual fund customers (Khorana, Servaes, & Wedge, 2007). In my sample, according to the statistical analysis performed in tables XXXI and XXXI B there is a positive relationship between director compensation and performance. In table XXXI, as reflected by the standard and Newey-West robust FE methodologies, director compensation is a positive regressor of mutual fund performance ($\beta = 0.2$, p<0.01 to p<0.05). Furthermore, in table XXXI B the positive relation between director compensation and mutual fund returns remains statistically significant but decreases in economic resonance ($\beta = 0.1$, p<0.01). In either case, this relationship, which confirms Khorana’s et al. (2007) findings, suggests that, to a certain extent, there might be a small portion of director compensation that is linked to fund performance or alternatively that well-paid independent directors are more willing to put pressure on mutual fund boards to approve lower fees.

VI. B. vi. Panel Data Heteroscedastic Regression

Heteroscedasticity appears when the dispersion of a variable is unequal across a range of values provided by a second variable used to predict it (Wooldridge, 2009). The premise of using multiplicative heteroscedastic regression is that the heterogeneity in my sample of mutual funds, explicitly differences between equity and fixed income funds, might transcend the control variables and other regressors put in place to account for mutual funds’ intrinsic differences and might cause the dispersion in brokerage commissions, mutual fund performance, and manager compensation to not be constant across my panel dataset. Before I run the three heteroscedastic regressions contained in table XXXII, I performed the Breusch-Pagan Lagrange Multiplier panel-level test to detect possible heteroscedasticity in the mean equation for each one of the dependent variables. However, this test is not infallible because it assumes
normality in the residuals. The appearance of heteroscedasticity would mean that the dispersion of brokerage commissions, mutual fund performance, and manager compensation varies across the mutual fund population. The validity of the models could be examined judging the explanatory power indicators included for each of the models in table XXXII.

It is common for equities or bonds, which are at the core of mutual funds, to become more volatile during certain periods, in response to economic conditions or news. Heteroscedastic regression models may help to describe brokerage fees, mutual fund manager compensation, or mutual fund performance while allowing for possible scenarios in which the funds are exposed to changing volatility. In general, performance from mutual funds invested in bonds may seem comparatively stable in comparison to performance from mutual funds invested primarily in equity. Perhaps, as practitioners consulted for this paper suggest, brokerage commissions for bond mutual fund are constant and underestimate the actual cost of transacting, which is reflected mostly by price differentials and not direct broker charges. Contrariwise, brokerage commissions from equity mutual funds are constantly evolving and likely reflect ever-changing market conditions.

Heteroscedastic regression models also compute the regressor variances because there could be information value in the volatility of a variable not only in its beta. The regressor variance provides a reference point for the relative impact or relevance of the regressor beta on the dependent variable; it could also provide an insight on the existent volatility surrounding a specific parameter. Heteroscedastic regression models do not assume homoscedasticity, as it is the case with most panel models, which require additional robustness constructions to allow for possible departures from constant volatility. Given the nature of the financial markets, in which mutual funds operate, and the assets that integrate or constitute these investment vehicles, it is well suited to allow for a model that assumes that volatility among specific types of mutual funds or during certain periods may change and that is informed by past variance. Moreover, heteroscedastic regression allows for the regressor volatility to be part of the construct that is informing the values of all the variables that shape brokerage commissions, mutual fund
manager compensation, or performance. The model has a built-in feature that allows the dependent variable to respond not only to the values of the regressors but also to their variances. This built-in feature should increase the accuracy of the model when heteroscedasticity is a possibility.

The multiplicative heteroscedastic regression model based on the work of Harvey (1976) is set up using a system of three equations for each of the three dependent variables: brokerage commissions, mutual fund performance, and manager compensation. The author proves that using maximum likelihood estimators (MLE) to construct the multiplicative heteroscedastic regression is more accurate than 2SLS estimation in the presence of heteroscedasticity. More recently, Tanizaki and Zhang (2001) using extensive Monte Carlo simulation, prove again that multiplicative heteroscedastic estimation using MLE is superior to the 2SLS methodology. Following Harvey (1976) in my estimation, each system of three equations includes a linear model to estimate the mean, a log-linear model to estimate the variance, and then to identify the wellness of fit one last model constructed using the fitted values for the mean and variances. The model assumes the residuals are independent and normally distributed. Given the fact that this estimation deals with panel data, the model includes yearly categorical variables and the unique fund identifier clusters the residuals to increase the robustness of the estimates.

Brokerage Commissions \[ \mu_{it} = \mu_{it} + \sigma_{it} e_{it} \] (15)

\[ \mu_{it} = E(Brokerage \text{ Commissions }_{it}) = \beta_0 + \beta_1 Turnover_{it} + \beta_2 Fees_{it} + \beta_3 FundCharact_{it} + \beta_4 CorpGovern_{it} \] (16)

Log(\sigma_{it}) = Log[Var(Brokerage Commissions_{it})] = \gamma_0 + \gamma_1 Turnover_{it} + \gamma_2 Fees_{it} + \gamma_3 FundCharact_{it} + \gamma_4 CorpGovern_{it} \] (17)

Manager Compensation \[ \mu_{it} = \mu_{it} + \sigma_{it} e_{it} \] (18)

\[ \mu_{it} = E(Mngr. \text{ Comp}_{it}) = \beta_0 + \beta_1 Comp_{it} + \beta_2 Fees_{it} + \beta_3 FundCharact_{it} + \beta_4 CorpGovern_{it} \] (19)

Log(\sigma_{it}) = Log[Var(Mngr. \text{ Comp}_{it})] = \gamma_0 + \gamma_1 Comp_{it} + \gamma_2 Fees_{it} + \gamma_3 FundCharact_{it} + \gamma_4 CorpGovern_{it} \] (20)

Performance \[ \mu_{it} = \mu_{it} + \sigma_{it} e_{it} \] (12)

\[ \mu_{it} = E(Performance_{it}) = \beta_0 + \beta_1 Comp_{it} + \beta_2 Fees_{it} + \beta_3 FundCharact_{it} + \beta_4 CorpGovern_{it} \] (13)

Log(\sigma_{it}) = Log[Var(Performance_{it})] = \gamma_0 + \gamma_1 Comp_{it} + \gamma_2 Fees_{it} + \gamma_3 FundCharact_{it} + \gamma_4 CorpGovern_{it} \] (14)
As noted earlier, brokerage fees, management compensation, and mutual fund performance are possibly linked to each other and their variability might be different across heterogeneous mutual funds. For instance, the error terms associated with the estimation of brokerage fees from very large mutual funds might have larger variances than error terms associated with the estimation of brokerage fees on smaller mutual funds. Larger funds have more discretion when it comes to how many trades they can execute before trading costs become too much of a burden to justify to investors. Hence, brokerage fees of larger mutual funds might be more volatile than trading costs from smaller funds. Heteroscedasticity violates one of the main assumptions of OLS estimation; although it does not result in biased parameter estimates. However, the variance of the parameters is no longer minimized; the standard errors might be biased providing inaccurate test statistics and confidence intervals, which affects the validity on the inferences extracted from the analyses. Therefore, to avoid heteroscedasticity concerns and to increase the inference prospects three multiplicative heteroscedastic regression models are set for: mutual fund manager compensation, brokerage commissions, and fund performance (Table XXXII). For the multiplicative heteroscedastic regression with brokerage commissions as the dependent variable, approximately 84 percent of the variance in brokerage fees is attributable to the linear combination of the controls, expenses, and corporate governance variables ($\chi^2=877.63, p<0.001$). For the multiplicative heteroscedastic model with manager compensation as the dependent variable, almost 90 percent of the variance in management fees is traceable to the linear combination of the control, expense, and corporate governance variables ($\chi^2=2,113, p<0.001$). Finally, in the last multiplicative heteroscedastic estimation, pertaining to mutual fund return, 11.5 percent of the variance in mutual fund return is traceable to the linear combination of the controls, expenses, and corporate governance variables. Given the panel-data character of the set, all three multiplicative heteroscedastic regressions include year-specific categorical variables added as control variables, as well as clustered standard errors by individual mutual fund.
Additionally, all three regression frameworks are largely the same, including mutual fund characteristics as control variables, as well as expense and corporate governance variables of interest. All six expense ratio regressors play a statistically significant role for at least two of three dependent variables throughout the models. Only three out of the twelve corporate governance characteristics are not statistically significant for at least two of three dependent variables, across all three regressions. The intercept is always statistically significant and only three control variables are not significant determinants for any of three dependent variables. Furthermore, the control variables are consistent with the prior analyses performed throughout brokerage commissions, return, and compensation regressions, against corporate governance, and mutual funds expenses, for the cross-sectional and panel data samples and with similar variables considered by the financial literature as presented below.

Using the panel dataset compiled for this study, the first two columns in table XXXII report the results on the heteroscedastic regression model, while clustering the residuals at the fund level to increase robustness in the parameters estimates, with brokerage fees as the dependent variable. The first column represents the mean values for the estimated coefficients, and the second column models the variance of the maximum likelihood regressors, reported in natural log terms. The intercept is significant (p<0.01) and four control variables are significant contributors to the variance in brokerage commissions as well. The mutual fund investment objective categorical variable suggests that average brokerage fees outside of the control group are approximately two percent lower (p<0.01); similarly, lower transaction costs outside of the investment objective control group reflect on tables VI through XI for the cross-sectional sample, and tables XXV B and XXVII B for the panel dataset. Cumulative return is the strongest contributor to brokerage commissions among control variables, with a one percent increase in compound return over the last three years accompanying a 7.25 percent decrease in brokerage fees (p<0.001); similar results are also portrayed in table VII. Fund life is a smaller but still significant positive regressor of brokerage fees (β=0.01, p<0.01); similar positive effects on brokerage fees associated with fund age appear in tables VI through VIII. Finally, the sponsor dichotomous indicator is also a large significant negative regressor of
brokerage fees, suggesting that publicly owned funds tend to charge lower brokerage fees, on average (β = -1.3, p<0.01). Four of the five expense ratio variables of interest are predictive of the variance in brokerage fees (in order of magnitude): management fees, expense ratio (excluding management commissions and 12b-1 fees), 12b-1 fees, and the soft dollar indicator. As predicted also by tables XXVI and XXVI B, there is a distinct direct relationship between the leftover expense ratio and brokerage fees; a one percent increase in the remaining expense ratio is associated with of a seven percent increase in brokerage commissions (p<0.01). Moreover, management fees are the strongest contributor to brokerage commissions, with a one percent increase in management fees accompanying a 9.7 percent increase in brokerage fees (p<0.001); similar results are also portrayed in tables XXVI and XXVI, for this same panel dataset. Similarly, a one percent increase in 12b-1 fees is related to a two percent increase in brokerage commissions (p<0.10). Finally, the indicator of whether the fund manager employs service brokers is a much smaller, but statistically significant, and positive regressor of brokerage fees (β=0.6, p<0.01); this result mirrors the ones appearing in tables XXVI and XXVI B. Of the corporate governance variables, six are significant brokerage fee regressors. A one-year increase in manager tenure is identifies a small almost zero reduction on brokerage commissions (β=-0.04, p<0.01); with a similar phenomenon reflected in tables XXVI and XXVI B. In terms of board composition, the number of independent directors and the number of women in the board are linked to brokerage commission. Increasing board independence, by adding one more independent director, relates to an almost one percent decrease in brokerage commissions (p<0.05); on the contrary, one additional woman in the board of directors increases brokerage fees by almost one percent (p<0.10); similar relationships between either board independence or board gender diversity and brokerage commissions are also present in tables VI through VIII for the cross-sectional sample, and tables XXV and XXV B, for this same panel dataset. Increased board monitoring, approximated by the number of committee meetings, is associated with a very small reduction in brokerage commissions (β=-0.01, p<0.01). In terms of COB characteristics both the amount the chair invests in a fund and the number of funds that the chair supervise have a positive effect on brokerage commissions. The funds in which the COB tend to invest more experience higher brokerage
commissions ($\beta=0.1, p<0.01$); as is evident also in tables VI through VIII, and table XXV B. Similarly, as the number of funds overseen by the COB increases so does brokerage commissions ($\beta=0.2, p<0.01$), perhaps the consequence of busy boards alleged inefficiency.

Next the attention is turned towards manager compensation; Deli (2002) provides evidence of large heterogeneity in managers’ compensation. The author finds significant differences between equity fund managers and bond fund managers, with managers from equity funds receiving a higher salary and experiencing more variability in their pay. The author also identifies that more active traders, identified by the fund’s turnover rate, perceive higher salaries. Interestingly, Deli (2002) also verifies an inverse relationship between fund size and management fees, something that is hinted by the signs in the TNA’s and the number of other officer’s coefficients from my analysis but that it is not mentioned in the discussion below because of lack of statistical significance. He believes that differences in mutual fund management fees are not only a consequence of differences in managers’ performance, or skill but also the result of differences in corporate culture, board structure, or parent company efficiencies (Deli, 2002).

For the heteroscedastic regression of management compensation, the log-likelihood value is highest among the three models, albeit log likelihood can only be compared among models that are structurally similar, this fact should not scape this analysis. The intercept is significant ($p<0.001$) as are six control variables (in order of magnitude): institutional flag, cumulative return, sponsor flag, objective, family, and fund life. The investment objective categorical variable confirms Deli (2002) results; managers from equity mutual funds are paid more than mutual fund managers running bond funds ($\beta=-0.17, p<0.001$). This pay gap is also reflected by the statistical analyses performed in the cross-sectional data, contained in tables XVI and XXI, and later on emerges also in the analyses of manager pay using BB98 GMM in tables XXVIII B, and XXX B. Mutual fund returns largely do play a role in manager compensation before, Farnsworth and Taylor (2006) reveal that according to self-reported data gathered from mutual fund managers’ returned questioners, mutual fund managers confess that their variable compensation is dependent upon the success of the mutual fund parent company, not the performance of their portfolio.
Cumulative return is computed net of mutual fund expenses, the source of sponsors’ profits, so it is feasible that this relationship is confirming the results from Farnsworth and Taylor’s (2006) study. The next control variable considers the age of the fund, there is a small but statistically strong negative relationship between funds life and manager compensation ($\beta = -0.002$, $p<0.001$). This same negative relationship between funds’ age and manager fees appears in tables XVI and XXI, for the cross-sectional analysis, and in tables XXVIII and XXX, centered on dynamic panels. According to Porter and Trifts (2014) older funds tend to also be larger funds, because the relatively more popular funds are the ones that get to survive, given that funds need to reach a critical mass to operate successfully. This assumption, that relates size and age aligns my results with Deli (2002), who finds a negative relationship between management fees and fund size. The next categorical variable identifies the fund family membership; according to the heteroscedastic regression, there are statistically significant differences on manager compensation that are influenced by the fund’s parent company ($\beta = 0.004$, $p<0.001$). Family membership remains also a positive significant regressor of manager compensation in tables XVI, XXI, and XXX. The next categorical variable identifies funds that are targeted to institutional investors. The heteroscedastic regression picks a negative relationship between management fees and funds marketed to institutional investors; as expected, institutional investors have lower management fees ($\beta = -0.3$, $p<0.001$). These results also appear in table XVI, for the cross-sectional analysis, and in the prior financial literature in works by James and Karceski (2006) and Adams et al. (2012). James and Karceski (2006) reveal that institutional investors often get lower management fees because they provide bookkeeping services or transact directly with the parent company through omnibus accounts. The last control variable reflects the nature of ownership of the parent company; according to the results presented in table XXXII, publicly held sponsors offer mutual funds with lower management fees ($\beta = -0.2$, $p<0.001$). The next group of variables from this heteroscedastic regression centers on mutual funds costs; of the five expense variables of interest, three are significant regressors of management compensation. A one percent increase in the leftover portion of the expense ratio is connected with a 1.12 percent decrease in management compensation ($p<0.01$). The same relationship between these two mutual fund expenses
appears in table XXI. Further, there is a negative relationship between brokerage fees and management fees ($\beta = -0.006, p<0.01$) and an even stronger negative link between the soft dollar compensation indicator, which identifies mutual funds that employ service brokers, and management fees ($\beta = -0.06, p<0.001$). The next block of manager compensation determinants are proxies for the mutual fund corporate governance. Ten of twelve corporate governance variables are significant management compensation regressors. In the realm of board composition, for the first time, the number of directors in the board is a significant indicator of manager compensation. According to the heteroscedastic regression results contained in table XXXII, there is a small but strongly significant relationship between the number of board members and manager compensation ($\beta = -0.02, p<0.001$). Similarly, there is also a negative, but larger, and statistically significant relationship between board independence and manager compensation, which is previously documented in table XVI. One additional independent director joining the board is associated with a half of a percent drop in manager compensation ($\beta = -0.5, p<0.001$). Similarly, in the realm of board independence, mutual funds boards led by an interested chair also approve higher salaries for their managers. The impact of the dual CEO-COB indicator is positive and statistically significant ($\beta = 0.02, p<0.05$). Raheja (2005), in her comprehensive analysis of corporate boards, highlights the importance of considering size and composition together when analyzing board impact on different firm characteristics. Following Raheja (2005) approach, albeit it is perhaps counter intuitive that larger boards, generally considered less efficient, are censoring management fees, one needs to consider the composition of these boards, which for mutual funds are largely independent. For the first time also, the number of female directors appears as a statistically significant regressor of manager compensation, capturing the positive effect that additional women on the board of directors have on manager compensation ($\beta = 0.15, p<0.01$). In regards to board ownership, as it been the case for other mutual fund expenses before, both independent director ($\beta = -0.001, p<0.05$) and chairman ($\beta = -0.002, p<0.10$) ownership are negatively related to management fees. Table XXVIII B also identifies the same relationship. This also confirms previous results that relate performance to board ownership. In this case, the higher performance achieved by funds in which the board invests, might be partially explained by the
lower level of fees approved. Both indicators of busy boards share the same negative relationship with manager fees, indicating that increased supervision actually outweighs the possible negative effects overly active boards. There is a small negative and statistically significant relationship between manager fees and the number of committee meetings ($\beta = -0.001, p<0.001$). Lastly, there is also a significant negative relationship between the number of boards led by the chair and the manager compensation ($\beta = -0.01, p<0.01$).

As noted before, management compensation may not be tied to mutual fund performance; however, it is possible that mutual fund managers’ salary is influencing performance or the fund’s return since it represents a net expense for customers or because higher pay is identifying better performers. Two articles from the financial literature indicate that mutual funds might not be able to outperform their benchmarks but mutual fund managers are good at picking stocks. Chen et al. (2000) and Baker et al. (2010) reveal that mutual fund managers’ security selection is on point. The stocks that mutual fund managers select to add to their portfolio outperform the ones that they decide to sell around the same time of the purchase. This occurrence, first noticed by Chen et al. (2000) is also apparent during earnings announcements, as confirm by Baker et al. (2010). In my analysis, the intercept ($p<0.05$) and risk are significant contributors to the variance in return. As portrayed in tables XXXI and XXXI B, risk is a negative regressor of mutual fund performance ($\beta = -0.02, p<0.001$). Elton et al. (2008) confirm once again the inability of active mutual funds to outperform passive strategies with similar risk levels. The authors verify that even when actively traded mutual funds increase their risk levels they cannot outperform index funds under most risk-adjust measurements (Elton, Gruber, & Blake, 2008). All except one of the expense variables of interest are significant regressors of return. Management fees is a significant negative regressor of return ($\beta=-0.03, p<0.001$); these results have been confirmed repeatedly throughout this research in cross-sectional statistical analyses from tables XXII and XXIV, and across all dynamic panel data methodologies in tables XXXI and XXXI B. As it happens, 12b-1 fees have the largest impact on mutual fund performance; however, for the first time the relationship is positive, with
an increase of one percent in 12b-1 fees connected with a 1.4 percent increase in return (p<0.01). Grinblatt and Titman (1998) also document a positive association between 12-b fees and performance; mutual funds charging 12b-1 fees provide positive abnormal returns. Simultaneously the authors recall a positive relationship between intensive trading, measure by above average turnover ratio and performance (Grinblatt & Titman, 1989). Similarly, brokerage fees ($\beta=0.004$, p<0.05) and the soft dollar indicator variable ($\beta=-0.03$, p<0.10) also carry a positive impact on performance; in both occasions the influence of the variables is quite small. Finally, the mutual fund’s cash balances have a small negative impact on return ($\beta=-0.007$, p<0.05); a relationship that is also captured by tables XXXI and XXXI B. The only remaining significant regressor of mutual fund performance relates to the level of experience of the mutual fund manager. There is a small negative statistically significant relationship between manager tenure and mutual fund performance ($\beta=-0.002$, p<0.05); Porter and Trifts (2014) provide confirmation for this result. According to the authors, typically the manager’s first and second years at the helm are the most successful for the mutual funds, which experience diminishing marginal returns afterwards (Porter & Trifts, 2014).

VII. Conclusion

Werner Karl Heisenberg, the German theoretical physicist and one of the fathers of quantum mechanics, is perhaps best known for the Heisenberg's uncertainty principle, which states that one can never know the position and momentum of a particle at any one time. In other words, one can never know the whole truth but only an approximation of it. The concept of unencumbered truth becomes even further complicated if one also recognizes that is not possible to understand anything without first taking into account the mechanism through which it is observed. Even though the truth might be out there the question is does it even ‘exist’. With this premise, I started this work not pursuing complete truth but
attempting to shed light on two overlooked aspects of the mutual fund financial literature: brokerage fees and mutual fund executive compensation. That is as much clarity as one could possibly derive from using the statistical methodologies that are available to a researcher in the field of corporate governance. In the pursuit of the accuracy, I use as many methods as I believe are necessary to gain sufficient trust in the conclusions that are compiled below. Surely, mutual fund investors are familiar with expense ratios, which are supposed to cover the costs of running the funds. However, there are other expenses associated with mutual fund investment: trading costs, soft dollar compensation, short-term capital gains taxes, loads, etc., which do not garner as much attention (Prior, 2010). Although, there is a general consciousness of the harm caused by mutual fund fees to investors’ returns over time, brokerage fees are frequently not part of the discussion because they are not easily available, at least not the same way that the main mutual funds asset-based costs are. Therefore, most academics, practitioners, and mutual fund investors largely overlook brokerage commissions. A recent study by Demos, a non-partisan public policy research and advocacy think tank, theorizes that after adding all the expenses associated with transacting, the trading costs accumulated by mutual fund managers, might be as large as the expense ratio (Hiltonsmith, 2012). My own research only considers a portion of transaction costs, brokerage fees; I focus on this portion of transaction costs because it is feasible to collect specific values for brokerage fees, from the mutual funds SAIs. However, according to my descriptive statistics, presented in table IV, the magnitude brokerage fees is also substantial; for instance, they add up to as much as 75 percent of the expense ratio in 2007. As such, mutual funds are sold to investors, their expense ratios and other costs are automatically accrued from their total invested assets every period, and investors are not fully informed of how much mutual funds cost. In this situation of clear information asymmetry there is potential for mutual fund parent companies to abuse their customers’ trust unless regulation is put in place to protect them. Investors are largely aware that index funds are a more affordable option; as such they have become increasingly popular. Nevertheless, it is possible that they would be even more prevalent if mutual fund customers realized that they might be grossly underestimating the cost of actively traded mutual funds. This research is designed to identify mutual fund characteristics that could inform
investors about the nature of mutual funds brokerage commissions, their relationship to mutual fund corporate governance, and how they fit within the mutual funds cost structure. Brokerage commissions are set mostly at the discretion of mutual fund managers, and largely removed from the scope of board actions. However, there is a possibility that corporate culture permeates from the board of directors and influences mutual fund managers in their decisions in regards to the type of brokerage firm that they select when they direct the funds’ trades. Alternatively, the board could set certain standards limiting the amount of soft dollar compensation that the mutual fund manager can employ, Blume (1993) and the Mutual Fund Reform Act of 2004 point in that direction. As part of this research process to gain insight into mutual fund corporate governance, the board of directors usually takes a prominent position. In the realm of board of directors’ research, compensation is a prevalent topic, because at a primary level it helps identifying incentives’ alignment and possibly how board decisions or actions might be influenced. First, there is a possibility that mutual fund boards that receive higher salaries would be more willing to tolerate higher expense ratios or higher transaction costs. Against my initial intuition that is not the case; mutual fund board compensation is not directly related to higher expense ratios or more complacent boards.

As Roiter (2016) points out, mutual funds are a product. As with any product in a competitive well-functioning market, the company that supplies it is going to charge its customers for the cost of providing the product. Furthermore, the firm is also going to extract as much additional rent as possible from its customers in order to make a profit. Unlike many industries, however, mutual funds have a large role in society. Approximately half of U.S. households own a mutual fund with a combined value of $15.7 trillion by year-end in 2015 (Investment Company Institute, 2016). Nevertheless, the importance of mutual funds’ position does not derive exclusively from their notable size; their primary function is also to serve as retirement conduits. According to the Investment Company Institute, over 90 percent of mutual fund customers declare that they are investing in mutual funds purposely so they can serve as their primary source of income after retirement. Three quarters of mutual fund investors also admit that
retirement is their household’s primary or only financial goal (Investment Company Institute, 2016). Further, unlike other industries with such an important role in society, the mutual funds’ parent companies, the purveyors of the funds, are not legally obligated to act in the best interests of their customers; the investment advisors and brokers who sell the funds are the ones who have the fiduciary responsibility (Novack, 2013). The Supreme Court’s decision in Janus Capital Group, Inc. v. First Derivative Traders, 131 S. Ct. 2296 (June 13, 2011) stipulates that the fund parent company is not liable for misleading investors with the statements in the prospectus, because the parent company is ultimately not responsible for their content. This Supreme Court ruling is interpreted as putting the final responsibility in the hands of the financial advisors and brokers (Carter, Zaccaro, Hamilton, & Reynolds, 2011). However, the lack of fiduciary responsibility enjoyed by mutual funds’ parent companies has not escaped everyone. In 2016, the U.S. Department of Labor approved a new rule expanding fiduciary responsibility for investment advisors and financial companies. The new law was scheduled to be enacted on April 7, 2017 but was delayed by the new administration for 60 days, until June 9, 2017, in order to review the new policy, given the lack of support among large financial institutions which fear to be held accountable (Andrews, 2017).

In terms of increasing fund customers awareness with respect to the hidden costs associated with investing in actively managed mutual funds, my study contributes to this line of research by confirming that turnover ratio is a viable alternative to brokerage commissions, since locating the latter requires significant efforts from investors. There is a direct strong relationship between brokerage commissions and turnover ratio, which conveys statistical significance across all regression models employed in both the cross-sectional and panel datasets. In regards to mutual fund characteristics that increase awareness of how brokerage fees are established, one of them also taps into another unexplored region of the financial literature: the obscure and fragmented trading of fixed income securities. A priori, the over the counter fixed income trading seems complex and unclear. According to all the statistical methodologies employed in this analysis, mutual funds that invest in bonds enjoy significantly lower transaction costs.
One possibility is that equity mutual funds employ a larger portion of service brokers. Alternatively, stock trading might be inherently more expensive than bond trading. Since bond trading happens primarily over the counter and access to the transaction costs of large institutional investors is limited, answering this question to a larger extent is the subject of another research paper. Furthermore, the parent company that sponsors the mutual fund has a definite impact on mutual fund brokerage expenses. There are several mutual fund families that have their own brokerage firms, for instance Vanguard, Fidelity, T. Rowe Price, etc., and they have been purposely growing their share in the broker services industry considerably. Additionally, several well-known brokerage service firms are also offering their own mutual funds to investors (Krantz, 2011). It is possible that mutual fund parent companies with in-house brokerage firms offer a different price for trading internally with their own brokerage house; perhaps they have a competitive advantage in trading expenses. This competitive advantage several mutual fund families have on brokerage fees might be a consequence of their size and scalability. My results confirm a negative relationship between brokerage commissions and mutual fund size measured by TNA, or alternatively, the number of other officers. Hence, there are clear economies of scale across mutual fund expenses and also in brokerage transactions. Although the relationship between mutual fund managers and brokerage firms is expected to be a long-term association, instead of simply seeking the most competitive price, larger funds appear capable of negotiating lower fees. For mutual funds, the importance in cultivating a long-term relationship with broker houses is even more relevant as the mutual fund increases in size. The main reason to have this symbiotic ongoing association is to prevent confidential information regarding the mutual fund investment strategies from becoming public. If brokers betray large mutual funds disclosing where their ‘smart money’ is being allocated, then these funds would be vulnerable to adverse price movements, which can erode any profit potential. Lastly, aligning with one of the most widely documented behavioral biases, overconfidence is possibly present in the mutual fund manager’s office. According to Baber and Odean (2001), investors tend to overestimate their skill levels, knowledge, and forecast abilities. One consequence of this overconfidence is the prevalence of active investment strategies despite the extensive evidence in favor of passive investment
(Barber & Odean, 2001). My empirical evidence, across all methodologies and both datasets, endorses a negative relationship between return and brokerage commissions, suggesting that additional trading from mutual fund managers does not only not result in superior performance but actually is ‘hazardous’ to mutual fund returns.

Focusing my attention on corporate governance, my intention is to verify if there are certain aspects of brokerage fees that would help understand how mutual fund corporate governance influences other aspects of mutual fund manager’s interaction with the board. My first hypothesis establishes that funds with stronger corporate governance should present smaller brokerage fees, after controlling for other possible brokerage fees’ determinants. According to Ferris and Yan (2007), mutual fund researchers should focus their attention on three corporate governance indicators: board size, board independence, and COB independence. My results satisfactorily find a strong and negative relationship between board independence and brokerage commissions, robust across all different statistical methodologies and throughout both datasets. This negative connection may arise due to more extensive monitoring implemented by independent directors. It is also possible that largely independent boards introduce an extra layer of internal guidelines limiting the amount of premium brokerage transactions that the mutual fund manager can execute, forcing him to conform to certain industry averages or previous standards. Brown (2017) and recent SEC sanctions point towards mutual fund boards taking a stronger stance on the contentious issue of soft dollar compensation (Abromovitz, 2014). The negative relationship between board independence and brokerage commissions confirms the premise of my first hypothesis, which associates weaker corporate governance to higher fees.

My second hypothesis states that mutual funds with higher expense ratios would tend to have higher brokerage fees, after controlling for other factors. The intuition behind this statement is that funds charge their customers higher fees because their cost structure makes them less efficient, or because their notoriety allows them to extract a larger portion of economic rents. The fact that mutual funds are capable of price discrimination by using different class shares, as documented by Iannotta and Navone
suggestions that is more likely the latter. By charging alternative prices to different customers for the same product, mutual funds have been able to extensively map up the demand curve, which allows them to extract a larger portion of the consumer satisfaction or utility area (Krugman & Wells, 2014). Mutual fund managers are in charge of allocating portfolio transactions to brokerage firms. Probably, their decision is based on long-standing relationships with brokers and the need to execute the transactions promptly and efficiently. Mutual fund managers have a choice between price-competitive capital brokers and service brokers, which charge a premium for transacting in exchange for research, i.e. soft dollar compensation. If managers’ decisions on where to transact are purely arbitrary then a persistent relationship between brokerage fees and other mutual fund expenses would be unlikely. In my statistical analysis there is a strong, stable, and positive relationship between brokerage commissions and the remaining portion of the mutual fund expense ratio, after extracting management fees and 12b-1 fees. Additionally, management fees, which account for the largest portion of the expense ratio, also have a reliable and positive connection with brokerage commissions. In both accounts, the strong positive association between brokerage fees and alternatively management fees or the leftover portion of the expense ratio is robust across all the statistical analyses implemented in this dissertation and through both datasets. Adams et al. (2012) introduce the idea of mutual fund costs being excessive across different expense categories while sharing a common core structure. The fact that I am capable of empirically recognizing these strong positive ties among mutual fund expenses confirms my second hypothesis and suggests that investors should remain vigilant with respect to the widely available mutual fund expense ratio, since it constitutes a fairly good indicator of another mutual fund hidden cost, i.e. brokerage commissions.

A natural progression, after finding this relatively robust relationship among three important mutual fund expenses, is to see how strongly board incentives or policies are contributing or challenging the mutual fund cost structure. In the financial literature, both executive and board compensation are perhaps the most direct way to identify how well incentives align with shareholders’ interests. Board
compensation and mutual fund manager compensation share common determinants among the mutual fund characteristics tested in this analysis. Investment objective plays a definite role once again, against independent director, independent COB compensation, and mutual fund manager compensation. My findings point towards bond funds offering lower salaries to their boards and managers. These relationships hold through both the longitudinal and vertical samples and are robust across all statistical methodologies. The results from my regression analyses also highlight the role of mutual fund family membership as a sine qua non determinant of independent directors, chairs, and managers pay. The family identifier emerges as a significant factor under every methodology employed and under both datasets. Finally, among the mutual fund characteristics that influence executive pay, mutual fund age also plays a significant role on board and mutual fund manager salary, albeit it carries opposite effects on each executive position. The mutual funds hazard or survival function identifies performance and size as the two most important explanatory elements (Lunde, Timmermann, & Blake, 1999). Older mutual funds tend to reward their boards with higher salaries. There is an important learning component in boards; independent directors with more experience perform better in their advising and supervising roles because they do not require as much time to catch up with new information and understand how the organization works internally (Harris & Shimizu, 2004). On the contrary, senior funds do not reward their portfolio managers with higher salaries in exchange for contributing to their survival. Porter and Trifts (2014) identify marginally diminishing returns, after the second year, for every additional period the mutual fund manager continues running the same fund; thus, my results might be capturing this discouraging situation. Finally, independent director compensation is lower for institutional funds relative to retail funds, across all statistical methodologies and in both the cross-sectional and panel samples. Relatively lower director pay may arise as a consequence of less monitoring required for institutional funds. Large financial institutions are usually more actively involved investors and add another layer of monitoring into the fund. Coffee (1991), Christoffersen (2001), and Edelen and Wagner (2001) provide empirical examples of how institutional investor sacrifice liquidity in favor of strengthening control and increasing supervision on behalf of shareholders interests across multiple countries.
My third hypothesis states that mutual fund manager and board compensation, controlling for other possible determinants, is going to be directly associated with weaker corporate governance. Hence, funds with weaker corporate governance structures in place are going to pay their board members relatively higher salaries. It is possible that higher board member salaries are set to compensate for the lack of clear board guidelines; alternatively, higher director pay is possibly designed to form more complacent directors. In the mutual fund literature, one of the pillars of corporate governance is the number of independent directors on the board. Board independence is frequently associated with stronger monitoring and control, less easily influenced boards, more impartial and fair director decisions, higher regard for investors interests, etc. (Tufano & Sevick, 1997; Guercio, Dann, & Partch, 2003; Ferris & Yan, 2007; Khorana, Tufano, & Wedge, 2007; Meschke, 2007; Cremers, Driessen, Maenhout, & Weinbaum, 2009; Adams, Mansi, & Nishikawa, 2012). In my analysis, board independence, as a proxy for strong corporate governance, is solidly and negatively related to independent director, independent chair, and mutual fund manager compensation. This relationship holds for the large majority of the statistical analyses performed and within both statistical samples considered. The negative relationship between a strong independent director presence and executive and board compensation conforms to the premise on my third hypothesis.

My fourth hypothesis entails that, after controlling for other influential factors, funds with higher expense ratios will tend to pay higher salaries to their executives. This hypothesis is born from the potential of agency type conflicts and the existence of asymmetric information in the mutual fund industry. As Deli (2002) reminds the reader, the mutual fund industry is an outstanding candidate for agency conflicts. The portfolio investment decision is not in the hands of the mutual funds’ customers but is delegated to an agent, the mutual fund manager; simultaneously, the decision to set the price for the services provided by the mutual fund is not in the hands of the sponsor nor the customer but it is delegated to another agent, the board of directors; the board has strong financial ties to the mutual fund parent company. Hence, potential conflicts of interest may arise between the funds’ customers and either
the mutual funds managers or the funds’ board of directors. The previous financial literature and publications from the practitioner side alike have identified one of the main problems embedded in the mutual fund industry: mutual fund fees are the source of mutual funds profits and of mutual funds customers’ grief (Golec, 2003; Bogle, 2009). When there are possible conflicts of interests, academics recommend setting the agents’ compensation in a way that incentivizes the desirable outcome the executives can influence. In this case, it would entail making mutual fund manager compensation dependent on mutual fund return and tying director compensation to diminishing expense ratios and other mutual fund expenses. Independent directors approve all mutual fund fees, including management fees, and serve in the compensation committee, which should consider the return attained by fund managers when establishing mutual fund manager compensation. Unfortunately, according to my results, mutual funds’ management compensation is not influenced by managers’ portfolio performance; hence, mutual fund managers’ incentive system, put in place by mutual fund parent companies, is in fact detrimental to customers. However, it is possible that the overt conflict of interest at the core of the mutual fund industry is not having the same pernicious effect on board compensation. Thus, independent directors are incentivized to defend mutual fund customers’ interests by adjusting mutual fund expenses. There is a negative relationship between board compensation and every mutual fund expense considered in this research, even the ones that are not traditionally part of the discussion surrounding mutual fund costs because they are not included in the expense ratio. Independent director compensation has a clear negative relationship with management fees, the remaining part of the expense ratio, and brokerage fees. These resilient inverse relationships are not vulnerable to model specification and appear for both datasets, the longitudinal sample and the vertical panel set. As a proof of the robustness of these results, the negative relationship between director compensation and manager compensation is symmetrical and director pay appears as a strong negative determinant of manager salary. Board compensation also is negatively associated with 12b-1 fees and the mutual fund cash balances, but the statistical significance of these two factors is not as widespread. Therefore, against my initial expectations, there is no explicit evidence of quid pro quo incentives being paid to independent mutual fund directors. Instead, the
situation is quite the opposite, with mutual fund boards being rewarded for challenging parent companies fees.

Finally, my last hypothesis is designed to identify the impact that my hand collected corporate governance characteristics, expenses, and mutual fund traits have on mutual fund performance. My fifth hypothesis states that poor mutual fund performance can be traced to higher fees, such as brokerage commissions, or generous executive compensation. From the set of possible mutual fund characteristics that could influence performance, the one that exhibits the largest degree of persistence and statistical resilience is the fund parent company identifier. Although, investment objective, TNA, number of other officers, or the funds’ age prove to be strong regressors of negative fund performance, their statistical significance is not as overwhelming as the one identified for mutual fund family membership. Similar level of statistical significance as a regressor of mutual fund performance is also found in several of the corporate governance proxies that I collected for this research. The number of meetings held by mutual fund committees has a detrimental effect on performance. The magnitude of this negative effect on performance is larger than the small dent that the payment of meeting fees might cause. Almazan et al. (2004) document the risk of imposing, what they consider to be, too many restrictions or too much monitoring on mutual fund managers. The authors analyze the impact of these restrictions on risk-adjusted returns’ variability, and their implications on deriving the appropriate incentive contracts (Almazan, Brown, Carlson, & Chapman, 2004). It is possible that overbearing boards, approximated by board activity and measured by number of committees or committee meetings, trump the mutual fund manager’s ability to undertake profitable investment strategies. There is a positive relationship between chairman tenure and mutual fund performance, according to a large number of statistical methodologies in both samples. Hence, either chair stability has a positive impact on mutual fund performance or that well performing mutual funds tend to maintain their chairmen leadership longer. As the chair remains in his position, he becomes more knowledgeable and more effective at supervising or advising the fund. The implications of chair tenure on performance are hard to disentangle. Vafeas (2003) illustrates the
possible tradeoff behind board tenure. The two possible conflicting consequences of board tenure are
known as the ‘expertise hypothesis’ and the ‘management-friendliness hypothesis’. Board longevity
provides directors with more knowledge or expertise but it might challenge their ability to remain
impartial and avoid camaraderie with the firms’ managers (Vafeas, 2003). The results presented here
indicate that the experience aspect of chair tenure prevails over the possibility of ‘befriending’
management at the expense of investors, at least in this parcel of mutual funds extracted from the
industry. Further, the last of the corporate governance characteristics that plays a positive and prevailing
role on mutual fund performance is board ownership. The mutual funds trusted by independent directors
and chairmen as recipients of their own investments tend to outperform other funds that are not as popular
among board members. Moreover, funds that convey board ownership do not present lower brokerage
commissions or management fees. Therefore, this positive relationship between ownership and fees
indicates that the positive performance funds chosen by board members experience, happens despite the
fact that these funds have higher fees. If the selected funds had lower fees, this would point towards a
conflict of interest and the preferential treatment of certain funds. The direct relationship between
superior mutual fund performance and board ownership has been extensively documented by mutual fund
financial academics (Khorana, Servaes, & Wedge, 2007; Chen, Goldstein, & Jiang, 2008; Kinnel, 2008;
Cremers, Driessen, Maenhout, & Weinbaum, 2009; Dvorak & Norbu, 2013). Finally, what is probably
the sine qua non condition on any mutual fund performance analysis also appears in my statistical
analyses; all mutual fund expenses cast a negative effect on performance. First, not only mutual fund
performance does not trigger any of the incentives embedded in manager variable compensation, but
actually manager fees convey the strongest negative impact on performance, across all methodologies and
throughout both the cross-sectional dataset and the time series panel. This strong negative influence of
management fees on performance is closely followed by the negative impact that the remaining portion of
the expense ratio has on performance. Likewise, two more mutual fund expenses carry robust negative
effects on performance: 12b-1 fees and the funds’ cash balances; albeit their effects are not as prevalent
and pernicious on performance as the ones cast by manager compensation and the remaining portion of
the expense ratio. Hence, I satisfactorily address my fifth hypothesis by relating mutual fund performance to specific mutual fund characteristics, corporate governance proxies, and expenses.

Influenced by the level of information asymmetry, the possible agency problems, and the conflicts of interest suggested by the prior financial literature, at the beginning of this thesis I set five hypotheses with the intent on clarifying the determinants of brokerage commissions and understanding mutual fund executive compensation. Hence, beginning with brokerage commissions, my first hypothesis states that funds with stronger corporate governance should have smaller brokerage fees. In this respect, I am able to link board independence to lower brokerage commissions. Next, my second hypothesis directly relates brokerage fees to the fund’s expense ratio. I verified that brokerage fees have a strong direct relationship with manager fees and the remaining portion of the expense ratio. In the realm of executive compensation, my third hypothesis associates weak corporate governance with relatively higher boards’ and managers’ pay. Once again, board independence brings discipline to the compensation committee in the form of lower independent director, chair, and mutual fund manager salaries. Further, my fourth hypothesis looks for the interaction between executive compensation and mutual funds’ expenses. In this case, my statistical results actually contradict the complacent board behavior I was expecting; on the contrary, director pay is inversely related to mutual fund expenses, aligning board and customer interests. Finally, my fifth hypothesis seeks additional clarity with respect to mutual fund performance. Perhaps the most interesting relationship that emerges from this analysis is the clear link between board ownership and performance.

There are several possible extensions of this work. I am interested in trying to dissect, if possible, the variable portion of director and mutual fund manager compensation. I want to get a clearer picture of which are the intended or unintended incentives in mutual fund executive pay structure. I suspect that the fixed portion of directors and managers salary is tied to TNA; however, I am hopeful that somehow mutual fund performance is linked to the variable portion of the salary, of at least mutual fund managers, and that the fixed compensation part overpowers it. In order to reach this further understanding of mutual
fund executive pay, I will need to specifically collect information only from mutual funds that disclose the separate components of independent director compensation and that clearly report manager compensation. In fact, manager compensation is harder to garner, mutual fund managers generally are part of management teams and run multitude of funds, complicating this task considerably. I also would consider to possibly looking at compensation in differential form; this would help isolate the share of executive salary that changes from period to period, which to a larger extent is the variable compensation portion. I also want to examine soft dollar compensation. I would like to try to identify the factors that drive mutual fund managers, in charge of dealing with brokerage houses, to seek soft dollar research in return for their trades. This decision is especially interesting because several researchers have hinted towards a possible conflict of interest, in which mutual fund managers collude with brokerage firms to reach a symbiotic agreement at the expense of mutual fund customers (Khorana & Servaes, 2004; Chen, Goldstein, & Jiang, 2008; Edelen, Evans, & Kadlec, 2013). There was an attempt to curb soft dollar compensation under the failed Mutual Fund Reform Act of 2004; I question why there is not any more support, political or otherwise, behind reforming this potentially ethically ambiguous element of mutual fund culture. The ideal setting would be to focus specifically on a sample of funds that use service brokers, and match it with a control sample of mutual funds of similar characteristics but that does not use soft dollar trading, and see what could be learned from contrasting the two. Lastly, I am also interested in the new fiduciary responsibility reform that is scheduled to be enacted at the time of the completion of this dissertation. Large financial institutions are implementing drastic changes to get ready for it. The new regulation is being extensively criticized from both sides, so the fact that no one is indifferent makes it particularly interesting. I am interested on what is going to be the impact of the extra layer of scrutiny on fees and compensation under the new regulation.
VIII. Bibliography


## IX. Tables

### Table I: List of Variables

<table>
<thead>
<tr>
<th>Variable Category</th>
<th>Variable Name</th>
<th>Quantitative Measure/ Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. Fund Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fund-specific characteristics</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVE</td>
<td>Belonging to One of the CRSP’s Objective Codes: Domestic Equity and Fixed Income</td>
<td>0, 1</td>
<td></td>
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<tr>
<td>TNA</td>
<td>Individual Fund Total Net Assets in Millions</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>FAMILY</td>
<td>Categorical Variable: Identifies the Fund Sponsor Membership</td>
<td>0-38</td>
<td></td>
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<tr>
<td>RETURN</td>
<td>Yearly Percentage Change on NAV</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE RET.</td>
<td>Compound Return Over the Prior Three Years, Calculated as a % Change on NAV</td>
<td>%</td>
<td></td>
</tr>
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<td>RISK</td>
<td>SD of Monthly TNA over One Year</td>
<td>%</td>
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<td>FUND LIFE</td>
<td>Number of Years since the Fund was First Offered</td>
<td>Years</td>
<td></td>
</tr>
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<td>FLOW</td>
<td>Growth of Funds’ TNA Net of Div. Reinvestment &amp; the Sum of the Capital Gains</td>
<td>%</td>
<td></td>
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<td>INSTITUTIONAL</td>
<td>Identifies if the Fund is Only Available to Institutional Investors</td>
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<td></td>
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<td>INDEX FUND</td>
<td>Dichotomous Variable Identifies Index Funds</td>
<td>0, 1</td>
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</tr>
<tr>
<td>SPONSOR</td>
<td>Categorical Variable to Distinguish Between Public and Private Ownership</td>
<td>0, 1</td>
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<tr>
<td>DEAD FUND</td>
<td>Identifies the Fund During the Year Prior to Its Disappearance</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td>OTHER OFFICERS</td>
<td>Number of Other Officers or Executives that Are Employed by the Mutual Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>II. Fund Expenses</strong></td>
<td></td>
<td>Expenses charged by the fund</td>
<td></td>
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<tr>
<td>LEFTOVER EXPENSE RATIO</td>
<td>Percentage of Total Assets Deducted Each Fiscal Year to Cover Fund Expenses Free of Management Fees and 12b-1 Fees</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>MANAGEMENT FEES</td>
<td>Percentage of TNA Deducted Each Year to Compensate Mutual Fund Managers</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>BROKERAGE FEES</td>
<td>Commissions Charged by Brokerage Firms to Individual Mutual Funds to Execute their Market Transaction as a Percentage of Total Assets</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>12b-1 FEES</td>
<td>Percentage of TNA Deducted Each Year to Cover Marketing or Distribution Expenses</td>
<td>%</td>
<td></td>
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<tr>
<td>SOFT DOLLAR COMPENSATION</td>
<td>Takes the Value of 1 to Identify Funds Using Brokerage Commissions Paid in Exchange of Market Transactions that Include also Payments for Research Services</td>
<td>0, 1</td>
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<tr>
<td>TURNOVER RATE</td>
<td>Proportion of Funds’ Holdings that Are Replaced Every Year</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>CASH HOLDINGS</td>
<td>Percentage of Total Assets Held in Cash</td>
<td>%</td>
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<tr>
<td><strong>III. Corp. Gov.</strong></td>
<td></td>
<td>Corporate Governance Variables</td>
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</tr>
<tr>
<td>REGULATION</td>
<td>Identifies Before &amp; After the Announcement of the Mutual Fund Reform Act of 2004</td>
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<tr>
<td>N° OF DIRECTORS</td>
<td>Number of Seats on the Board</td>
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<tr>
<td>INDEPENDENT DIR.</td>
<td>Number of Independent Directors that Serve in the Board</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>FEMALE DIRECTORS</td>
<td>Number of Female Directors that Serve in the Board</td>
<td>%</td>
<td></td>
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<tr>
<td>INDEPENDENT COB</td>
<td>Categorical Variable equals 1 if the Chair of the Board is independent</td>
<td>0, 1</td>
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<td>N° OF BOD MEETS</td>
<td>Number of Board Meetings During the Fiscal Year</td>
<td></td>
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<tr>
<td>N° OF COMMITTEES</td>
<td>Number of Committees Formed by the Board of Directors</td>
<td></td>
<td></td>
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<tr>
<td>N° OF COMMITTEE MEETINGS</td>
<td>Number of Meetings Held by the Committees Formed by the Board During the Year</td>
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<tr>
<td>DUAL CEO</td>
<td>Takes the Value of 1 to Identify Funds to Identify Funds with dual CEO/COB Roles</td>
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<td></td>
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<tr>
<td><strong>IV. Director Traits</strong></td>
<td></td>
<td>Refers to Directors' Characteristics</td>
<td></td>
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<tr>
<td>N° OF F OVERSEEN</td>
<td>Number of Mutual Funds Overseen by Director within the Family</td>
<td></td>
<td></td>
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<tr>
<td>PORTFOLIO OWN</td>
<td>Range of Individual Mutual Fund Shares Owned by Directors</td>
<td>0-4</td>
<td></td>
</tr>
<tr>
<td>DIR. FUND COMP.</td>
<td>Director Compensation per Individual Fund</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>DIR. AGGR. COMP.</td>
<td>Director Compensation per Fund Family</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>V. COB Traits</strong></td>
<td></td>
<td>Refers to COB Characteristics</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>COB's Age</td>
<td>Years</td>
<td></td>
</tr>
<tr>
<td>TENURE</td>
<td>Number of Years Charing the Fund</td>
<td>Years</td>
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<tr>
<td>FUNDS OVERSEEN</td>
<td>Number of Mutual Funds Overseen by the COB within the Family</td>
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<td></td>
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<tr>
<td>PORTFOLIO OWN</td>
<td>Range of Individual Mutual Fund Shares Owned by the COB</td>
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</tr>
<tr>
<td>COB FUND COMP.</td>
<td>COB Compensation per Individual Fund</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>COB AGGR. COMP.</td>
<td>COB Compensation per Fund Family</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>VI. Manager Traits</strong></td>
<td></td>
<td>Refers to Fund Manager Characteristics</td>
<td></td>
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<tr>
<td>TENURE</td>
<td>Number of Years Managing the Fund</td>
<td>Years</td>
<td></td>
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</table>
## Table II: Descriptive Statistics Cross-Sectional Data

Description of variables is presented in Table I.

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
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<td>TNA[^1]</td>
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<td>8,132.32</td>
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<td>12.417</td>
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<td>6</td>
<td>5.604</td>
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<td>-0.0482</td>
<td>0.1918</td>
<td>-0.6455</td>
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<td>-0.1967</td>
<td>0.439</td>
<td>-8.4664</td>
<td>3.3256</td>
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<td>0.009</td>
<td>0.0063</td>
<td>0</td>
<td>0.053</td>
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<tr>
<td>Expense Ratio[^2]</td>
<td>0.00378</td>
<td>0.0021</td>
<td>0.0085</td>
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<td>0.00999</td>
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<td>0.0055</td>
<td>0.0082</td>
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<td>0.014</td>
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<tr>
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<td>0.0023</td>
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<td>0.01</td>
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<td>0.0008</td>
<td>0.0071</td>
<td>0</td>
<td>0.0101</td>
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<td>0.0004</td>
<td>0.0041</td>
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<td>0.0055</td>
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<td>Turnover Rate</td>
<td>121.3344</td>
<td>51</td>
<td>226.6338</td>
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<td>2626</td>
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<td>% of Cash</td>
<td>4.53</td>
<td>1.21</td>
<td>18.8803</td>
<td>-12.698</td>
<td>15.099</td>
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<tr>
<td>N° of Directors</td>
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<td>9</td>
<td>2.6377</td>
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<tr>
<td>Independent Directors</td>
<td>7.26</td>
<td>8</td>
<td>2.6296</td>
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<td>Female Directors</td>
<td>1.68</td>
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<td>1.144</td>
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<td>Directors Fund Ownership</td>
<td>3.45</td>
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<td>6.351</td>
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<td>Funds Overseen by Directors</td>
<td>119.09</td>
<td>133</td>
<td>66.668</td>
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<td>Dir. Comp. per Fund</td>
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<td>$1,877.50</td>
<td>$10,686.52</td>
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<td>$244,000.00</td>
<td>$90,417.61</td>
<td>$500.00</td>
<td>$428,500.00</td>
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<td>5</td>
<td>0.6598</td>
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<td>8</td>
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<tr>
<td>N° of Committees</td>
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<td>4</td>
<td>2.649</td>
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<td>$9,713.89</td>
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<td>$50,000.00</td>
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<td>59</td>
<td>9.1356</td>
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<td>6.8806</td>
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<tr>
<td>Funds Overseen COB</td>
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<td>133</td>
<td>69.7612</td>
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<td>248</td>
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<td>COB Fund Ownership</td>
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<td>0</td>
<td>1.367</td>
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<td>COB Comp. per Fund</td>
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<td>$6,328.57</td>
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<td>10</td>
<td>17.933</td>
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</table>

[^1]: In millions of dollars
[^2]: Expense Ratio Excluding Management Fees, and 12b-1 Fees

Number of observations 918
Table III: Correlation Table Cross-sectional Data

Description of variables is presented in Table I.

<table>
<thead>
<tr>
<th>TNA</th>
<th>Family</th>
<th>Return</th>
<th>Flow</th>
<th>Expense</th>
<th>Expense‡</th>
<th>Mgmt. F</th>
<th>12b-1 F</th>
<th>% Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>-0.144†</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Return</td>
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<td>-0.092</td>
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<td></td>
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<td></td>
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<tr>
<td>Flow</td>
<td>-0.059*</td>
<td>-0.164†</td>
<td>0.412†</td>
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<td>-0.0234</td>
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<td>0.553†</td>
<td>0.066</td>
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<td>Expense‡</td>
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<td>-0.0516</td>
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<td>0.296†</td>
<td>-0.834†</td>
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<td>0.247†</td>
<td>-0.381†</td>
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<tr>
<td>12b-1 Fee</td>
<td>-0.01***</td>
<td>0.340†</td>
<td>0.0568*</td>
<td>0.0039**</td>
<td>0.7379†</td>
<td>0.1123†</td>
<td>0.1637†</td>
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</tr>
<tr>
<td>% of Cash</td>
<td>-0.0486</td>
<td>0.2832‡</td>
<td>-0.0441</td>
<td>-0.188†</td>
<td>0.356†</td>
<td>0.054*</td>
<td>0.1214†</td>
<td>0.342‡</td>
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<td>Brokerage Fee</td>
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<td>0.104***</td>
<td>0.0326</td>
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<tr>
<td>Turnover Ratio</td>
<td>-0.09***</td>
<td>0.113***</td>
<td>0.074**</td>
<td>0.0125</td>
<td>0.221†</td>
<td>0.007</td>
<td>0.101***</td>
<td>0.214†</td>
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</table>

Cross-sectional Data

<table>
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<tr>
<th>Broker</th>
<th>Turn</th>
<th>N-Dir.</th>
<th>Indpt.</th>
<th>Fem</th>
<th>DirComp</th>
<th>Dir Own</th>
<th>Dir Over</th>
<th>Meets</th>
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<tr>
<td>Turnover Ratio</td>
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<td>Dir. Fund Own.</td>
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<td>0.1461†</td>
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<td>0.3669†</td>
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<td></td>
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<tr>
<td>N-D F Overseen</td>
<td>-0.0721</td>
<td>0.095***</td>
<td>0.2443†</td>
<td>-0.3736†</td>
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<td>0.216†</td>
<td>0.1178†</td>
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<td>N of Committees</td>
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<td>-0.1004***</td>
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<td>0.0099</td>
<td>0.0454†</td>
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<td>COB Fund Ownership</td>
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<td>0.0558*</td>
<td>0.0767**</td>
<td>0.422†</td>
<td>0.5318†</td>
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<td>COB Comp. per F</td>
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<td>0.9041†</td>
<td>0.5237†</td>
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<td>-0.1221†</td>
<td>0.120‡</td>
<td>-0.0841***</td>
<td>0.1408†</td>
<td>-0.1482†</td>
<td>-0.1458†</td>
<td>0.0567*</td>
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</table>

<table>
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<th>Meet F</th>
<th>Comm</th>
<th>CoMeet</th>
<th>COB Age</th>
<th>COB Ten</th>
<th>COBseen</th>
<th>COBown</th>
<th>COBCom</th>
<th>MagrTen</th>
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</thead>
<tbody>
<tr>
<td>N of Committees</td>
<td>-0.0336</td>
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<tr>
<td>Committee Meets</td>
<td>0.264†</td>
<td>0.9168†</td>
<td>0.5051†</td>
<td>0.3579†</td>
<td>-0.0048</td>
<td>0.5051†</td>
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<tr>
<td>COB Age</td>
<td>0.2716†</td>
<td>0.4139†</td>
<td>0.0306</td>
<td>0.2565†</td>
<td>-0.0048</td>
<td>0.3579†</td>
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<tr>
<td>COB Tenure</td>
<td>0.2716†</td>
<td>-0.1555†</td>
<td>0.1508†</td>
<td>0.0617*</td>
<td>-0.0129</td>
<td>0.1187†</td>
<td>-0.3196†</td>
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<tr>
<td>N of Funds Over., COB</td>
<td>-0.0618</td>
<td>0.0606*</td>
<td>0.2033†</td>
<td>-0.227†</td>
<td>0.0617*</td>
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<tr>
<td>COB Fund Ownership</td>
<td>-0.0453</td>
<td>-0.1555†</td>
<td>-0.1508†</td>
<td>0.0617*</td>
<td>-0.0129</td>
<td>0.1187†</td>
<td>-0.3196†</td>
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<tr>
<td>COB Comp. per F</td>
<td>-0.34†</td>
<td>-0.2859†</td>
<td>-0.2932†</td>
<td>-0.3022†</td>
<td>0.3274†</td>
<td>-0.4394†</td>
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<tr>
<td>Manager Tenure</td>
<td>-0.0313</td>
<td>0.1127†</td>
<td>-0.0393</td>
<td>0.1936†</td>
<td>-0.0464</td>
<td>-0.1859†</td>
<td>0.211†</td>
<td>-0.0047</td>
</tr>
</tbody>
</table>

1 Expense Ratio Excluding Management Fees, and 12b-1 Fees
† p < 0.001  ‡ p < 0.01  † † p < 0.05  * p < 0.1