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Mutual Causality between Mutual Fund Fees, Board Structure, and Performance: Empirical Evidence from the Egyptian Stock Market

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Abstract

This paper investigates dynamic interaction between mutual fund fees, board structure, and performance. This paper provides an unbiased estimate of a structural equation model taking endogeneity into account. This paper provides an empirical assessment of the possible conflicts of interest in respect of different types of fund fee structures in the Egyptian mutual fund industry. Experimental results show a significant negative relationship between the expenses ratio and fund performance. Given the important role of mutual fund industry in Egypt, this is the first study of its kind explores the causality between fees, board structure, and performance in the mutual fund.

Keywords: Mutual Funds, Conflict of interest, Asymmetric information, Corporate Governance, Structural Equation Model
JEL classification:G34, G23, C3.

1. Introduction

A mutual fund is a financial vehicle whereby investors' money is pooled together and invested in accordance with the owner's requirements. Mutual fund investments have become popular over the past few decades mainly due to the highly liquid characteristics of capital markets and the benefits of diversification (Chiu and Zhu, 2017). Worldwide, the number of open-ended funds reached 118,978 in 2018 compared to 88,525 in 2011 (Szmigiera, 2019). Cao *et al* (2014) states that the ownership of mutual funds by U.S. households hit 44% in 2011 compared with less than 6% two decades before.

According to Szmigiera (2019) the main advantages of investing in a mutual fund are entrusting their investment to a professional fund manager, diversification and lower transaction costs than direct investments. However, Gruber (1996) questions why actively managed mutual funds have grown so fast when their performance on average has been inferior to that of index funds. He suggests that the reason for this is because they are bought and sold at net asset value and therefore the ability of the manager may not be priced.

Kacperczyk *et al* (2005) suggest that mutual fund managers may decide to concentrate their holdings within industries in which they have an informational advantage which on average tends to perform better than the index. Nanda, Wang, and Zheng (2004) support this view by providing evidence that fund managers who follow a more focused investment strategy perform better, which is possibly due to their informational advantages.

Mahoney (2004) describes a mutual fund as a 'black box' that uses an unknown process to turn cash into profitable returns for investors. Due to this perceived opaqueness it can said that there are potential conflicts of interest within the industry.

The first conflict arises from investors wanting fund companies to maximise their risk-adjusted returns, whereas fund companies or managers may decide to maximise their own interests by taking actions that increase their money inflows (Chevalier and Ellison, 1997). Kacperczyk *et al* (2005) support this by suggesting that fund managers adopt volatile investment strategies, such as holding industry concentrated portfolios in order to increase their chances of better performing funds.

Another potential conflict of interest arises from compensation structures: investment advisors may have incentives to recommend products to investors for reasons that are not strictly based on the expected risk-adjusted returns. This conflict may arise when fees compensate advisors and managers regardless of performance.

If such conflicts of interest do exist, investors would observe a market in which flows of investor capital into mutual funds were less sensitive to past performance, and possibly towards funds that have lower risk adjusted returns.

The aim of this paper is to examine the causality between mutual fund fees, board structure, and performance. We empirically consider whether or not fund fees-performance is moderated by the structure of fund board. The results indicate that stronger investor protection is associated with lower mutual fund fees.

The rest of this paper is organised as follows: section 2 reviews the previous literature; section 3 discusses the research gaps including the aims and objectives, and research problem; section 4 discusses the empirical hypothesis on the mutual causality between fund fees, board structure, and performance; section 5 discusses the research design including the econometric approach and data description; section 6 lays out the structural equation modelling analysis. Finally, section 7 concludes, and it presents research contributions.

2. Literature Review

The majority of mutual fund literature tends to focus on past performance, according to Ramasamy *et al* (2003) this is because it's the simplest and easiest way to gauge the future performance of a fund. However, previous research regarding whether past performance is a good indicator of future performance is mixed (Ramasamy *et al*, 2003). Some studies state that there is only a small relationship between previous performance and current returns, or no relationship at all (Brown and Goetzman, 1995). Alternatively, Goetzman and Ibbotson (1994) find that prior two-year performance is a predictor of performance over the following two years.

With regards to research relating to actively managed vs passively managed funds, the existing literature focuses primarily on whether fund managers' stock selection efforts generate excess returns that justify the associated fees and transaction costs (Daniel, Grinblatt, Titman and Wermers, 1997; Malkiel, 1995).

2.1. Fee Structure

Fees involved in mutual funds are extremely important to the industry as they can affect the value of an investor's return. The complex nature of fund fees should be carefully considered by investors as no other goods or services have a charge for buying a product or service, as well as the price of that product or service (Mansor *et al*, 2015). Mutual fund fees pay for the services provided to investors by the fund and, as the main service provided is portfolio management, fees should reflect funds' risk-adjusted performance (Gil-Bazo and Ruiz-Verdu, 2009). Fees can be split into compulsory fees and operating expenses, load funds generally charge both sets of fees whereas no-load funds only charge expense-related fees (Mansor *et al*, 2015). However, mutual fund fees, such as incentive fees, are

designed to attract more skilled managers or those who will exert more effort when managing a fund (Elton *et al*, 2003).

Depending upon the way in which a fund is managed, this can influence the expense ratio[1]; in 2018, actively managed funds had a ratio of 0.76% whereas passively managed funds had a lower ratio of 0.08% (Szmigiera, 2019).

2.2. Relationship between Mutual Fund Fees and Performance

According to Gil-Bazo and Ruiz-Verdu (2009) many studies have attempted to determine whether mutual funds are able to consistently earn positive risk-adjusted returns, although these studies have found significant differences in risk-adjusted returns across funds, Sharpe (1966) states that those differences are to a large extent due to differences in fund fees.

Haslem *et al* (2008) study the performance of 1,779 mutual funds as of 31st December 2006 in the US and find that, on average, large funds with lower expense ratios, low trading activity and no or low front-end loads outperform funds with higher fees. Pollet and Wilson (2008) find that higher expenses, both the expense ratio and total load fees associated with the funds have a significantly negative impact on returns. Gil-Bazoand Ruiz-Verdú (2008) imply that higher-quality funds are expected to charge lower fees.

Gil-Bazoand Ruiz-Verdú (2009) state that underperforming funds have higher fees because they incur higher operational expenses, such as marketing or advertising, which is paid for by the investor.

Elton *et al* (2003) were the first to study the use of incentive fees by mutual funds and examine the effect of such fees on the behaviour of mutual fund managers. They describe an incentive fee 'as a reward structure that makes management compensation a function of investment performance' (p.779). If a fund has incentive fees, Elton *et al* (2003) state that fund holders will gain two benefits compared to funds with no incentive fees, better stock picking ability and lower operational expenses. Elton *et al* (2003) find that although funds with incentive fees do not tend to outperform the index, they do, on average, outperform funds with no incentive fees. They also find that incentive-fee fund managers take more risk than non-incentive-fee funds, however fund managers do adjust their risk taking dependent upon the performance of the fund.

Ippolito (2015) and Milkiel (1995) both agree that due to the fees involved in actively managed funds, investors would be better off buying index funds with lower fees.

2.3. Relationship between Corporate Governance and Fund Performance

The U.S. mutual fund scandal in 2003 put corporate governance of mutual funds in the spotlight and led to a series of regulatory reforms (Cao *et al*, 2014). As a result, Morningstar Fiduciary Grades (renamed the Stewardship Grades in 2005) were launched, evaluating funds, not just on their past performance, but also on their corporate governance standards. Stewardship Grades range from A (highest) to F (lowest) and are calculated as the aggregate scores of five components: Corporate Culture, Board Quality, Manager Incentives, Fees and Regulatory History (Cao *et al*, 2014).

Wellman and Zhou (2008) were the first to examine the relationship between mutual fund governance and mutual fund performance. Using the first release of the Morningstar Stewardship Grades they find that good funds[2] outperformed bad funds by a significant 23 basis points per month in the mean over the period from January 2001 to July 2004 and in the 27 months after the announcement of the grades, good funds outperformed bad funds by a significant 10 basis points. They also found that investors used the stewardship grades to decide which funds to buy and sell. In addition, their findings showed only two of the five variables, Board Quality and fees, showed significant explanatory power,

[1]Chance and Ferris (1991)define expense ratio as the total expenses divided by total assets.
[2]'Good' funds are those graded A or B and 'bad' funds are graded D or F.

indicating that a mutual fund's board of directors and fees can have significant effects on the performance of the fund (Wellman and Zhou, 2008).

Cao *et al* (2014) examine how Stewardship Ratings serve as a performance indicator for mutual fund performance. They find that corporate governance grades of mutual funds carry an informational content beyond that of the star ratings for predicting long-term mutual fund performance as well as providing an effective tool for selecting funds.

Gil-Bazo and Ruiz-Verdu (2009) find that better governance is associated with fees that are more aligned with fund performance. In addition, Navone (2011) finds that funds with a better Board Quality grade are associated with less aggressive fees by fund companies, although they find no evidence that better Board Quality grades translate into a lower expense ratio. However, according to Wellman and Zhou (2008) some critics of the mutual fund grades claim that Morningstar should 'stick to the quantitative evaluation of investment returns and not venture into more intangible issues such as fund governance' (p.3).

Fama and Jensen (1983) argue that the board structure of a mutual fund is less important than a non-mutual fund corporations as fund managers use fund flows to discipline managers, i.e. they punish poor-performing managers by withdrawing their flows and reward good managers with new flows into funds.

2.4. Mutual Funds in Emerging Markets

Modern portfolio theory states that financial markets of developed economies offer no additional returns to investors due to them being almost efficient, which is why investors have begun to move towards emerging markets. Lemeshko and Rejnuš (2015) state that there is no surprise in the last 20 to 25 years mutual funds from emerging economies with their 'high growth rates, frequent abnormal returns and less than perfect positive correlation with developed economies' (p.476) have been attracting more investors.

Due to their increasing popularity emerging markets funds performance is becoming more widely researched (Agrawal, 2011; Swinkels and Rzezniczak, 2009; Islam and Dewri, 2016), however Lemeshko and Rejnuš (2015) state that the results of this research are mixed.

Lemeshko and Rejnuš (2015) aim to re-evaluate absolute and relative risk-adjusted performance of open-end equity mutual funds on the sample of advanced, secondary and frontier economies from the Central and Eastern Europe, from the South Eastern Asia, from the Middle East and North Africa, and BRIC economies for the time span from 2000 to 2015. Their results show that funds located within these markets do not seem to outperform the market, these results are true through the whole business cycle, i.e. in times of crisis, recession, recovery and economic growth. However, despite this underperformance some funds, depending on how sensitive they are to macroeconomic changes, are able to reverse their direction in order to outperform the market. Overall, Lemeshko and Rejnuš (2015) find that despite general and quite persistent underperformance of majority of equity funds which are operating in 27 emerging economies, in every group of countries, except the MENA[3], there is a small number of top performing funds, which manage to outperform regardless of overall macroeconomic situation and condition of the local capital markets. Eling and Faust (2010) support these results as they also find that most mutual funds do not outperform traditional benchmarks.

3. Research Gaps

A large body of empirical research on corporate finance suggests that fee structures improve performance, but this research has serious issues with endogeneity (Wintoki et al., 2012). However, the implications for the empirical work will be use-fullness if it does not deal with endogeneity problem, because the results will be biased and cannot be dependable (Roberts & Whited, 2012).

[3]MENA = Middle East and North Africa.

Consequently, when this research investigates the role of fee structures on performance, endogeneity comes from the powerful association between past values of the regress and (performance) and current values of the regressors (fee structures) (Wintoki et al., 2012; Agrawal & Knoeber, 1996; Rediker & Seth, 1995; Chandio, 2011; Klein & Zur, 2011; Westland, 2010; Rundle-Thiele et al., 2008; Cornett et al., 2007; Hair et al., 2006). There are many methods of overcoming this including Maximum likelihood (ML) and Generalized Method of Moments (GMM).

The first method (2SLS/3SLS) requires finding an Instrumental Variable (IV). The solution to such a problem is to change the way we estimate β to make it identifiable. For this, we should have an "instrument", a variable which we can refer to as z. There are two conditions that should be satisfied about z to consider it a valid instrument:

z must be uncorrelated with ε: $E(\varepsilon\ z) = 0$.

z must be correlated to x, and preferably, this correlation will be as high as possible: $E(z\ x) \neq 0$.

We can use lagged variable as (IV). Thus, X1t is a current (present-time) exogenous variable, while X1(t-1) is a lagged exogenous variable, with a lag of one time period. Additionally, (3SLS) method requires three steps: first-stage regressions to get predicted values for the endogenous regressors; a (2SLS) step to get residuals to estimate the cross-equation correlation matrix; and the final 3SLS estimation step. (2SLS/3SLS) is a Limited Information Maximum Likelihood (LIML) which estimates a single structural equation at a time.

Although, GMM and ML is a general framework for deriving estimators, there is a difference between the assumptions of the two methods. ML estimators use assumptions about the specific families of distributions for the random variables to derive an objective function. It selects the parameters that are probably have generated the observed data, which can be proceeded by maximizing an objective function. GMM estimators use assumptions about the moments of the random variables to derive an objective function. The assumed moments of the random variables present population moment conditions, which can be achieved by minimizing an objective function. Accordingly, ML can be more efficient than GMM, because ML uses the entire distribution instead of using specified moments only (Breitung and Lechner, 1995).

The second method is (SEM) which is a multivariate technique that allows us to estimate a system of equations. Structural Equation Models are often drawn as Path Diagrams. Different likelihood values can be obtained when fitting the same model with SEM and GSEM because the normality of observed exogenous variables is never assumed with GSEM. SEM is a Full Information Maximum Likelihood (FIML) which estimates all the equations and all the unknown parameters jointly.

Therefore, this paper utilizes SEM which is a multivariate technique that allows us to estimate a system of equations. Structural Equation Models are often drawn as Path Diagrams. SEM is a Full Information Maximum Likelihood (FIML), which estimates all the equations and all the unknown parameters jointly and obtains robust findings, compared with GMM.

3.1. Aims and Objectives

Most studies that have investigated the interaction between mutual fund fees and performance have focused on the developed stock markets. There is relatively less research using data from emerging markets and none so far on the Egyptian stock market. This paper presents proprietary data obtained directly from mutual funds in Egypt that relate detailed mutual fund specific types of fee structures to fund performance. The Egyptian context is particularly interesting as there are a very wide array of different components of fees, and the overall magnitude of fees in Egypt has been noted to be rather high relative to other parts of the world (Ruckman, 2003; Khorna and Servaes, 2011).

3.2. Research Problem

One potential conflict of interest in mutual fund compensation structures is that investment advisors may have incentives to recommend products to investors for reasons that are not strictly based on the expected risk-adjusted performance of the investment. This conflict may arise when fees compensate advisors and managers regardless of performance. If such a conflict of interest exists, we would observe a market in which **flows of investor capital into mutual funds were less sensitive to past performance, and possibly towards funds that have lower risk adjusted performance.**

To test this proposition, we empirically consider whether or not fund fees-performance is moderated by the structure of fund board.

This study attempts to examine the causality between mutual fund fees, board structure, and performance.

4. Hypotheses Development

Equity mutual funds have undergone dramatic changes with respect to the types of fees they charge investors (Dellva and Ollson, 1998). Mutual funds vary not only in their investment objectives but also in the fees they have. In this section we will discuss the different components of fees and their effects on performance and expense ratio.

Fund Fees: Baumol et al. (1990) document economies of scale in the U.S. mutual fund industry, and Dermine and Röller (1992) study economies of scale for French funds. Otten and Bams (2002) examine the impact of fees on European mutual fund performance in five countries (France, Italy, Germany, Netherlands, and the U.K.). Franks et al. (1998) compare the direct regulatory costs for the investment management industry across three countries. They find that the costs in the U.K. are twice as high as in the U.S. and four times as high as in France, but similar research across other countries has not been documented. While these studies are very useful, they do not allow for a detailed cross-sectional national analysis of fees.

On the contrary, Khorana et al. (2009) research methodology is designed to study these cross-sectional differences. They analyse fees for 46,799 funds offered for sale in 18 countries in 2002. They find that larger funds and fund complexes charge lower fees, as do index funds, funds of funds, older funds and certain funds selling cross-nationally. Fees are higher for funds distributed in more countries and funds domiciled in offshore locations.

However, they find that all types of fees (e.g. management fees, total expense ratios, and total shareholder costs include expenses plus loads) are lower when funds are domiciled in countries with an older fund industry. Moreover, management fees are lower in wealthier countries with a more educated population, where there is either little concentration in the banking industry. The most robust of these factors is that stronger investor protection is associated with lower mutual fund fees.

Consequently, in the examination of the governance of mutual funds, fund fees are investigated. It is emphasized that this study focuses on the direct decisions made by the boards of mutual funds relative to negotiated fund fees; boards have an indirect decision-making capability relative to fund performance (Tufano and Sevick, 1997). Fees can be broken down into two categories: (1) Ongoing yearly fees to keep a person invested in the fund, represented by the expense ratio; (2) Transaction fees paid when a person buys or sells shares in a fund (loads), however this does not exist in Egypt.

We first estimate this equation using the expense ratio as our measure of mutual fund fees. A test of the equilibrium relation between mutual fund fees and performance can be carried out by regressing expense ratios on fund performance as specified in the equation or, alternatively, by running a regression of fund performance on expense ratios. We optimize for the former approach for two reasons.

The first reason has to do with comparability of results, since a number of studies have regressed different measures of performance typically net of expenses on expense ratios (e.g., Carhart, 1997; Chevalier and Ellison, 1999). The second reason has to do with the statistical properties of the

coefficient estimates. Since funds' true alphas are not observed, estimated alphas are used instead, so our measure of fund performance contains a significant amount of measurement error. Therefore, if performance is included as a regressor, its estimated coefficient will be biased towards zero because of the attenuation bias induced by measurement error. Regressing expenses on estimated performance (for which we expect measurement error to be much smaller), however, yields an unbiased estimate (Levi, 1973). The association between the fund fees (measured by expenses ratio) and the fund performance (measured by Sharpe ratio) will be investigated in this study and will test the following hypothesis:

H1: There is a negative relationship between fund fees and fund performance$(\boldsymbol{Perf_{it}})$**.**

Board Committee Structure: To examine the role of board committee structure on the performance of mutual funds, this study focuses on investment committees and audit committees. An investment committee is a specialized group on the board that monitors and advises the fund on investment policy and a fund's historical performance. An audit committee examines the procedures the fund has established for maintenance of regulatory policy, due diligence, and return maximization.

Similar to Chan *et al*. (2013) and Lassoued and Elmir (2012), the proportion of directors on the investment committee are included in the regression analysis. Furthermore, Klein (1998) finds a positive correlation between the percentage of inside directors on investment committees and stock returns. This result is consistent with Fama and Jensen‟s (1993) argument that an inside director presents prominent knowledge helping the board of directors to make the right investment decisions in the long-term strategy. Similarly, Lam and Lee (2012) find that there is a positive correlation between nomination committee and performance. The association between the proportion of directors on the investment committee and the fund performance (measured by Sharpe ratio) will be investigated in this study and will test the following hypothesis:

H2: There is a positive relationship between proportion of directors on the investment committee and fund performance$(\boldsymbol{Perf_{it}})$**.**

Board Size: Studies of the US mutual fund industry show that larger boards are linked to higher fees for shareholders due to higher bureaucracy costs (Tufano and Sevick, 1997). Adams et al. (2009) examine the relation between boards of directors and shareholder wealth by employing a sample of mutual funds designed to track the performance of various domestic equity indexes. Overall, their results suggest that large boards are associated with higher expense ratios.

On the other hand, corporate governance studies argue that larger boards exhibit more consistent operations and communication policies (Byard and Weintrop, 2006; Cheng, 2008). Larger board size also enhances the effectiveness of control mechanisms and board monitoring efficiencies (Sánchez et al., 2011). Since trustees play an important role in negotiating and monitoring the fees of asset consultants and fund managers, Bryan et al. (2009a) argue that larger boards are linked to lower fees. This is because larger boards can broaden the collective knowledge and experience of trustees, enhance communication and debates about critical issues and decisions and set up advanced governance structures and monitoring mechanisms.

Furthermore, larger boards enjoy economies of scale that allow the governance practices to be implemented at lower cost to the fund and their members. This leads to the following hypothesis.

H3: There is a negative relationship between board size and fund fees$(\boldsymbol{Exp\ Ratio_{it}})$**.**

Director's Background: Similar to Brickley et al. (1994), the proportion of directors with a background in finance or investment as financial directors, and the proportion of directors who are retired or serve in several different boards as professional directors are determined. Although there has been little research into the relation between director's background and fund fees, this study believes it is an important factor and it should have been examined. Similar to Brickley et al., they find the results of their study to be driven by the proportion of professional independent directors. They find professional directors have the greatest positive coefficient (0. 085) of the four types, and this is the only one that is individually significant. Brickley et al. (1994) also contend professional directors are best equipped given their experience in oversight and their desire to maintain their reputation. Therefore, they could negotiate fees rigorously with sponsors. Based upon the previous discussion, the

relationship between the proportion of professional directors and fund fees will be investigated in this study and will test the following hypothesis:

H4: There is a negative relation between proportion of professional directors on the board and fund fees $(\boldsymbol{Exp\ Ratio_{it}})$**.**

Equity Ownership by Directors: The ability of equity ownership to align managerial interests is a well-established proposition in the corporate finance literature (e.g. Shleifer and Vishny (1997)). Mitra et al. (2007) examine the empirical relationship between ownership characteristics and audit fees. By employing a cross-sectional least square regression analysis for a sample of 358 New York Stock Exchange listed firms audited by the Big Five auditors, they find evidence of a significant positive relationship between diffused institutional stock ownership (i.e. having less than 5% individual shareholding) and audit fees, and a significantly negative relationship between institutional block holder ownership (i.e. having 5% or more individual shareholding) and audit fees.

Finally, they document that managerial stock ownership is negatively associated with audit fees. Similarly, this variable is included to examine if equity ownership by directors supports their fulfilment of shareholder interests and equity ownership by each director is reported within one of five EGP ranges. Similar to Ferris and Yan (2007), the proportion of directors holding zero shares is used as the measure of equity ownership by directors rather than the proportion of directors holding more than EGP 100,000 (or any other EGP range) because holding zero shares of the funds strongly reveals the absence of any incentive for the fund directors. Based upon the previous discussion, the relationship between the equity ownership by the directors and fund fees will be investigated in this study and will test the following hypothesis:

H5: There is a positive relationship between the equity ownership by the directors and expenses ratio $(\boldsymbol{Exp\ Ratio_{it}})$**.**

Director's Tenure: Similar to Villiers et al. (2011), director's tenure is measured as the average number of years the firm's directors have served on the board of either the fund management company or any other boards. Chan et al. (2013) examine whether independent audit committee members board tenure affects audit fees. They find that audit fees are lower for firms with a high proportion of long board tenure directors on the independent audit committee than for firms with a low proportion of long board tenure directors on the independent audit committee.

The result is consistent with the argument of Del Guercio et al. (2003) that directors who are long-serving can lose their capability to stay independent and become less effective as representatives for the shareholder interests. Therefore, they do not protect shareholder interests, and do not negotiate fees rigorously with the sponsors.

Based upon the previous discussion, the relationship between the director's tenure and fund fees will be investigated in this study and will test the following hypothesis:

H6: There is a positive relationship between the director's tenure and expenses ratio $(\boldsymbol{Exp\ Ratio_{it}})$**.**

Corporate Governance Index: The analysis focuses primarily on the effect of the company board of directors and ownership structure on fund fees (Denis and McConnell, 2003). The international corporate governance literature demonstrates that an external governance mechanism is an important measure of corporate governance used to protect shareholder interests (La Porta et al., 1998). Similar to Erkens et al. (2012), the influence of corporate governance on fund fees is explored. A governance index is constructed - calculated as an average of six governance indicators: (1) Effective Corporate Governance Framework (2) The rights of shareholders (3) The equitable treatment of shareholders (4) The role of stakeholders in corporate governance (5) Disclosure and transparency (6) The responsibilities of the board - using the annual reports of the companies and the companies websites, based on the OECD Corporate Governance Principles April 2004 (EFSA), and the maximum index value is six (100%).

Rowe and Davidson (2005) examine the efficacy of closed-end mutual fund governance. They use a set of 130 closed-end equity and bond funds with 390 fund-year observations over the period

1994-1996. Their results are similar to those in the study of open-end funds by Tufano and Sevick (1997), and this similarity is important for two reasons. First, confirming their findings provides more trust to the role of boards in protecting shareholders from excessive agency costs. Second, Tobe (2000) argues that there is a growing lack of trust in the mutual fund industry. Unless something is done to protect shareholders from excessive expenses, the next market downturn will lead to stringent government regulation.

Furthermore, they find a strong inverse relation between the percentage of outside directors on boards and closed-end fund expense ratios. This supports previous findings of board structure studies that effective board monitoring mitigates agency costs, and there is evidence that outside directors' ownership helps to align management interests with those of shareholders and reduces fees.

On the contrary, the result is consistent with Ebaid (2011) and the argument that the internal audit function in Egypt suffers from many weaknesses that negatively affect its effective role in corporate governance. First, internal audit in Egyptian firms does not enjoy a considerable level of organizational independence or management support, and does not have the adequate level of qualification necessary to fulfill their new responsibilities. Second, the internal audit function in the Egyptian firms still focus on the traditional role pertaining to traditional financial audit and has not shifted to the new expanded role, whereas internal audit adds value to the organization through providing assurance and consulting activities pertaining to monitoring, evaluating, and improving risk management, control, and governance process. Finally, there is a weak level of interaction between internal and external audit in Egyptian firm.

Furthermore, the result is consistent with Fawzy (2003) in that regardless of how corporate governance standards in Egypt have improved significantly, as reflected in the overall assessment of all five OECD principles, the degree of progress is still far from properly implementing corporate governance principles. Accordingly, corporate governance in Egypt, in its current status, has no significant effect on decreasing fund fees because corporate governance rules include in the Egypt Code of Corporate Governance: Guidelines and Standards - to promote responsible and transparent behaviour in managing corporations, according to international best practices that strike equilibrium between various parties' interests - are not mandatory and lack legislative force, so it is not clear how auditors would react to client's voluntary adoption of corporate governance practices (Sharma et al., 2008).

Based on the previous discussion, the relationship between the corporate governance index of the fund management company and fund fees will be investigated in this study and will test the following hypothesis:

H7: There is a positive relationship between the corporate governance index of the fund management company and expenses ratio $(\boldsymbol{Exp\ Ratio_{it}})$.

The following discussion contains a brief description of the control variables.

Time: The period of study is between 2007 and 2013 due to data availability in relation to factors that can affect the performance of the fund. Jones (2007) suggests that investors who wish to maximize return should start their search by looking for younger funds. Similarly, Aggarwal and Jorion (2010) find strong evidence of out-performance of hedge funds during the first two to three years of existence. Based upon the previous discussion, there is a negative relationship between the fund age – which increases over time – and fund performance. Accordingly, there is a negative relationship between the time and fund performance.

Investment Objective Dummy Variables: The type of investment objective a fund adopts affects the risk of a fund's investment portfolio and the return that the fund earns (Williamson, 1972). Similar to Ferris and Yan (2007), Tufano, and Sevick (1997), a series of dummy variables is included to capture the investment objectives represented in the sample to take a value of 1 if the fund belongs to the same category under study and zero otherwise. The investment objectives represented in the sample are: Fund Obj1: Open End Fixed Income Fund, Fund Obj2: Open End Equity Fund, Fund Obj3:

Open End Balanced Fund, Fund Obj4: Open End Islamic Fund Obj 5: Open End Money Market Fund, and Fund Obj 6: Others.

Standard Deviation of the Stock Return: Agrawal and Knoeber (1996) include standard deviation of the mutual fund return in their analysis as one of the indicators of the cost arises from holding undiversified portfolio, and they find a negative relationship between the standard deviation of the stock return and the percentage of shares owned by directors. Similar to them, the standard deviation of the mutual fund return is included on Model (A) to control for the total risk.

5. Research Design

5.1. The Data

The simple random sample for the study is extracted from an updated version of Egyptian mutual funds database in the Egyptian Stock Market existing at the end of December 2013, which is 48 mutual funds representing 60%, approximately of the population size. The data is collected from financial statements, prospectuses, and board of directors' annual reports of Egyptian mutual funds between 2007 and 2013 due to data availability. Daily closing prices for EGX30 (benchmark index) will be collected from the Bloomberg, World Bank, Egyptian Stock Exchange (ESE), Egypt Information Dissemination Company (EGID), and Egyptian Financial – Hermes (EFG-Hermes) Group for a period of 2007-2013.

Endogenous and Exogenous Variables Measurements

This study uses different endogenous variables, exogenous variables, and control variables which might influence the fund performance (Huber and Mellace, 2013). The endogenous variables in this study are the financial performance of mutual funds in the Egyptian Stock Market, and fund fees. The empirical analysis is carried out using risk adjusted performance analysis ratios such as Sharpe ratio.

Similar to Agrawal and Knoeber (1996), the standard deviation of the mutual fund return is included on model (A) to control for the total risk. See, Table 1 providing a full set of variables of the study.

Table 1: Summary of Endogenous, Exogenous and Control Variables

Endogenous Variables	**Measures**	**Source**
Mutual funds financial performance $(Perf_{it})$	$SI_{it} = \frac{(R_{it} - R_{ft})}{\sigma_i}$	Calculated from mutual fund's prospectuses, mutual fund's financial statements, and economic review of Central Bank of Egypt.
Mutual funds fees $(Fees_{it})$	$Exp_{Rat} = (\frac{Tot\ opt_{Fee}}{Fund\ Size}) \times 100$	Calculated from mutual fund's financial statements.
Exogenous Variables	**Measures**	**Source**
Board size (B_{Size})	The size of the board .	Board of director's annual reports of Egyptian mutual.
Proportion of independent directors $(Ind_{\ Dir})$	The number of independent directors on the board divided by board size.	Board of director's annual reports of Egyptian funds.

Director's background $(Fin_{Dir}, Prof_{Dir})$	The directors' background. The number of directors with a background in finance or investment divided by board size. The number of directors who are retired or serve on several different boards as professional directors divided by board size.	Board of director's annual reports of Egyptian funds.
Board committee structure (Inv_{Comm}, Aud_{Comm})	The number of directors on the investment committee divided by board size. The number of directors on the audit committee divided by board size.	Board of director's annual reports of Egyptian mutual funds.
Director's tenure (Dir_{Tn})	The average number of years the firm's directors have served on the board either the fund management company board or any other boards.	Board of director's annual reports of Egyptian mutual funds.
Corporate governance index (CGQ)	A constructed governance index calculated as an average of six governance indicators. A series of dummy variables is included to describe each of the six components of the corporate governance index of each company represented in the sample to take a value of 1 to indicate the presence of each governance indicator, and zero to indicate the absence of each indicator. $CGQ_i = Framework + Shareholders\ Rights + Shareholders\ Treatment + Stakeholders\ Role + Disclosure + Board\ Responsibilties$ $CGQ = \frac{1}{n} \sum_{i=1}^{n} CGQ_i.$	Calculated from the annual reports of the fund management companies and the companies' websites
Equity ownership by directors (Dir_{Own})	The number of directors holding zero shares divided by board size	Board of director's annual reports of Egyptian funds.
Control Variables	**Measures**	**Source**
Time	The years dummies between 2007-2013.	Sample Period.
Investment objective dummy variables $(Fund_{Obj})$	This study uses dummy variables for the investment objectives represented in the sample, to take a value of 1 if the fund belongs to the same category under study and zero otherwise.	Mutual fund prospectuses.
Standard Deviation of the Stock Return (σ_i)	The standard deviation of mutual fund returns.	Calculated.
Fund size (Log_{size})	The logarithm of total net assets of the fund.	Calculated from mutual fund's financial statements

Source: Developed by the researcher

5.2. Description of Sample Characteristics

This section presents descriptive statistics regarding Fund and Governance. Table 2 includes Panel A: Fund and Governance Descriptive Statistics for the model (A) which will be illustrated below. The results are based on a sample of 501 annual and semi-annual observations for 48 mutual funds from 2007 to 2013.

1. Panel A: Fund and Governance Descriptive Statistics

Panel A provides fund and corporate governance statistics for the overall sample, and has mean values of -0.50%.

For the overall sample, on average, the board structure is comprised of eight directors, and about 83% of them are independent directors. The board composition, on average, consists of 28% of directors on the audit committee, and 18% of directors on the investment committee. The board of directors, on average, includes 34% financial directors, and 43% professional directors. The average tenure of directors is 19 years. In terms of director ownership, about 86% of directors hold zero shares. Furthermore, the major funds in the sample belong to open end equity fund.

Table 2: Descriptive Statistics of Fund Performance and Fund Fees

Panel A: Fund and Governance Descriptive Statistics
Model A
Number of obs = 501

Variable	Mean	Std. Dev.	Min	Max
Time	2010.477	1.921971	2007	2013
Dump	0.493014	0.500451	0	1
Perf	-0.5085	1.111996	-5.18687	1.007129
ExpRatio	0.043864	0.07083	0.001775	0.491961
S	0.018585	0.014008	0.000145	0.057216
BSize	8.898204	3.331609	3	17
IndDir	0.833356	0.256488	0	1
AudComm	0.287743	0.097186	0.090909	0.5
InvComm	0.18647	0.128505	0.058824	0.545455
DirOwn	0.869083	0.229877	0	1
DirTn	19.41118	5.630506	6	29
FinDir	0.344418	0.208506	0.090909	0.666667
ProfDir	0.432507	0.31718	0.090909	0.888889
CGQ	0.599468	0.178972	0.166667	0.833333
LogSize	19.07212	1.781551	15.32	23.79
FundObj1	0.393214	0.488952	0	1
FundObj2	0.165669	0.372155	0	1
FundObj3	0.137725	0.344955	0	1
FundObj4	0.275449	0.447187	0	1
FundObj5	0.027944	0.164978	0	1

6. Empirical Evidence

To test the effect of board composition on mutual fund performance, this paper utilizes SEM technique to deal with the endogeniety problem through the following three stages model: specification, model estimation, and goodness of fit indices (Hair et al., 2006).

In this paper we investigate the interrelationships between fund fees, and performance simultaneously, and investigate whether differences in fees reflect differences in the value that mutual funds create for investors.

To check the robustness of the findings, we use robust statistical techniques and performance measures:

- "xtdpdml" which can do the SEM + panel data: a non-recursive structural equation model has causation which flows in both directions.

6.1. Structural Model Specification

Considering the potential endogeneity problem between fund fees and fund performance and similar to (Erkens et al., 2012; Adams, 2012; Tufano and Sevick, 1997; Del Guercio et al., 2003; Hermalin and

Weisbach, 2001; Ferris and Yan, 2007; Agrawal and Knoeber, 1996), the central research question focuses on whether or not board structure-performance is moderated by the structure of fund fees by using the following structural equation model.

The first equation of the SEM can be modelled by the following specification:

1. $$\boldsymbol{Perf_{it}} = \alpha_{it} + \boldsymbol{\alpha_1}\,(\boldsymbol{Fees_{it}}) + \boldsymbol{\alpha_2}\,(\boldsymbol{B_{Size}}) + \alpha_3\,(Ind_{Dir}) + \alpha_4\,(Fin_{Dir}) + \alpha_5\,(Inv_{Comm}) + \alpha_6(Aud_{Comm}) + \alpha_7\,(Log_{Size}) + \alpha_8\,(\sigma_i) + \alpha_9\,(Time) + \alpha 10\ Dump + \alpha 11 FundObj1 + \alpha 12\ FundObj2 + \alpha 13\ FundObj3 + \alpha 14\ FundObj4 + \varepsilon\ it$$

Lastly, the determination of fee structure is also endogenized using the following specification following the literature on ownership structure:

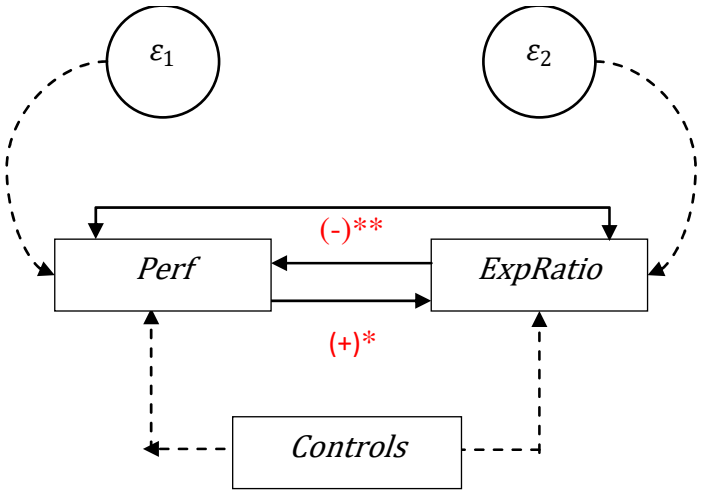
2. $$\boldsymbol{Fees_{it}} = \alpha_{it} + \beta_1\,(\boldsymbol{Perf_{it}}) + \boldsymbol{\beta_2}(\boldsymbol{B_{Size}}) + \beta_3\,(Ind_{Dir}) + \beta_4\,(Prof_{Dir}) + \beta_5\,(Fin_{Dir}) + \beta 6\ DirTn + \beta 7 InvComm + \beta 8 AudComm + \beta 9(CGQ) + \beta 10\ DirOwn + \beta 11 Dump + \beta 12\ LogSize + \beta 13 FundObj1 + \beta 14\ FundObj2 + \beta 15\ FundObj3 + \beta 16\ FundObj4 + \alpha 17\ \sigma i + \varepsilon it$$

6.2. The Estimation Results

The using Perf (Sharpe ratio) is respectively named as Model (A). The detailed estimation results of the model (A) are reported in Table 3, and we illustrate the path diagram of the two endogenous variables in Figure 1.

According to the previous, in testing the hypotheses, results reveal that there are seven hypotheses in this study, and seven hypotheses i.e. H1, H2, H3, H4, H5, H6, and H7 are statistically significant. Thus, these hypotheses are supported.

Figure 1: Path Diagram of the Structural Equation Model



Notes: * 10% level, ** 5% level, *** 1% level

Table 3: Estimated Path Coefficients of the SEMs

Panel A: The Effect of Mutual Fund Fees on Fund Performance Model A		
Perf	**(1)**	**(2)**
ExpRatio	-3.52067**	(0.004)

Dump	0.0878475	(0.179)
BSize	-0.0237833	(0.112)
IndDir	0.2598727	(0.066)
S	-7.352018	(0.087)
Time	-0.1717605***	(0.000)
InvComm	0.8358438*	(0.019)
AudComm	-0.5839431	(0.204)
LogSize	-0.0529024	(0.096)
FinDir	-0.372381*	(0.043)
FundObj1	0.320547	(0.157)
FundObj3	0.3905784	(0.095)
FundObj4	-1.801249***	(0.000)
FundObj2	0.2967812	(0.192)
Panel B: The Effect of Fund Performance on Mutual Fund Fees		
ExpRatio	**(1)**	**(2)**
Perf	0.0230215*	(0.020)
Dump	0.014605*	(0.012)
BSize	-0.012223***	(0.000)
IndDir	-0.0005005	(0.986)
S	0.3309528	(0.421)
InvComm	-0.0316811	(0.369)
AudComm	-0.1015575	(0.053)
DirOwn	0.0783418*	(0.029)
LogSize	-0.0058946	(0.067)
DirTn	0.0020186**	(0.004)
FinDir	0.2264332**	(0.001)
ProfDir	-0.1772348***	(0.000)
CGQ	0.0977735*	(0.011)
FundObj1	0.0454325*	(0.029)
FundObj3	0.055167**	(0.009)
FundObj4	0.0706218*	(0.032)
FundObj2	0.0702122***	(0.000)
var(e.Perf2)		
Constant	346.4714***	(0.000)
var(e.ExpRatio)		
Constant	0.0751907	(0.197)

Note: This table provides results from SEM of the effect of Mutual Fund Fees on Fund Performance for the sample of 48 funds from 2007-2013. In Model (A), mutual fund fees measured by the expense ratio. A robust t-statistics test is conducted, and p-values are in parentheses. Column (2) provides p-values. Column (1) presents the path coefficients of the model (A). * Statistical significance at 10% level, ** Statistical significance at 5% level, *** Statistical significance at 1% level.

6.3. The Direct, Indirect and Total Effects

Table 4 demonstrates direct, indirect, and total effects among all variables in the Structural Equation Model. It includes two panels: (A) and (B), respectively.

Panel A: The Effect of Mutual Fund Fees on Fund Performance

Panel (A) demonstrates several significant direct, indirect, and total effects. Firstly, ExpRatio, and InvComm have significant direct influence on Perf. Secondly, ExpRatio, and InvComm have significant indirect influence on Perf through the mediating effect of Bsize (ExpRatio →BSize → Perf, InvComm → BSize → Perf). Finally, ExpRatio, and InvComm have significant total influence on Perf. The Structural Equation Model indicates that evaluation of total effects on the determination of Perf, arising from the combination of direct and indirect effects of the variables in the model.

Panel B: The Effect of Fund Performance on Mutual Fund Fees

Panel (B) demonstrates several significant direct, indirect, and total effects. Firstly, DirOwn, DirTn, ProfDir, and CGQ have a significant direct influence on ExpRatio. Secondly, DirOwn, DirTn, ProfDir, and CGQ have a significant indirect influence on ExpRatio through the mediating effect of BSize (DirOwn → BSize → ExpRatio, DirTn → BSize → ExpRatio, ProfDir → BSize → ExpRatio,

and CGQ → BSize → ExpRatio). Finally, DirOwn, DirTn, ProfDir, and CGQ have a significant total influence on ExpRatio.

Table 4: Summary of Direct, Indirect and Total Effects of Structural Equation Model

Model A	Direct Effect		Indirect Effect		Total Effect	
	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: The Effect of Mutual Fund Fees on Fund Performance						
Perf						
Perf			-0.07497	0.156	-0.07497	0.156
ExpRatio	**-3.52067**	**0.004**	**0.26396**	**0.340**	**-3.25671**	**0.001**
Dump	0.087848	0.179	-0.05415	0.047	0.033697	0.582
BSize	-0.02378	0.112	0.04159	0.013	0.017807	0.278
IndDir	0.259873	0.066	-0.01785	0.844	0.242019	0.128
s	-7.35202	0.087	-0.5266	0.699	-7.87862	0.060
Time	-0.17176	0.000	0.012878	0.167	-0.15888	0.000
InvComm	**0.835844**	**0.019**	**0.040509**	**0.724**	**0.876353**	**0.011**
AudComm	-0.58394	0.204	0.374524	0.092	-0.20942	0.642
DirOwn			-0.25514	0.100	-0.25514	0.100
LogSize	-0.0529	0.096	0.023164	0.122	-0.02974	0.358
DirTn			-0.00657	0.033	-0.00657	0.033
FinDir	-0.37238	0.043	-0.70951	0.041	-1.08189	0.006
ProfDir			0.577202	0.029	0.577202	0.029
CGQ			-0.31842	0.064	-0.31842	0.064
FundObj1	0.320547	0.157	-0.17199	0.059	0.148554	0.494
FundObj3	0.390578	0.095	-0.20895	0.040	0.181632	0.411
FundObj4	-1.80125	0.000	-0.09495	0.296	-1.8962	0.000
FundObj2	0.296781	0.192	-0.25091	0.021	0.045869	0.827
Panel B: The Effect of Fund Performance on Mutual Fund Fees						
ExpRatio						
Perf	0.023022	0.02	-0.00173	0.376	0.021296	0.008
ExpRatio			-0.07497	0.156	-0.07497	0.156
Dump	0.014605	0.012	0.000776	0.590	0.015381	0.005
BSize	-0.01222	0.000	0.00041	0.404	-0.01181	0.000
IndDir	-0.0005	0.986	0.005572	0.213	0.005071	0.845
S	0.330953	0.421	-0.18138	0.154	0.149575	0.695
Time			-0.00366	0.012	-0.00366	0.012
InvComm	-0.03168	0.369	0.020175	0.077	-0.01151	0.720
AudComm	-0.10156	0.053	-0.00482	0.643	-0.10638	0.032
DirOwn	**0.078342**	**0.029**	**-0.00587**	**0.292**	**0.072468**	**0.024**
LogSize	-0.00589	0.067	-0.00068	0.344	-0.00658	0.033
DirTn	**0.002019**	**0.004**	**-0.00015**	**0.214**	**0.001867**	**0.004**
FinDir	0.226433	0.001	-0.02491	0.171	0.201527	0.001
ProfDir	**-0.17723**	**0.000**	**0.013288**	**0.231**	**-0.16395**	**0.000**
CGQ	**0.097774**	**0.011**	**-0.00733**	**0.259**	**0.090443**	**0.009**
FundObj1	0.045433	0.029	0.00342	0.504	0.048853	0.014
FundObj3	0.055167	0.009	0.004181	0.430	0.059348	0.003
FundObj4	0.070622	0.032	-0.04365	0.034	0.026969	0.243
FundObj2	0.070212	0.000	0.001056	0.827	0.071268	0.000

The Goodness of Fit

The fit indices shown in Table5 indicate that the hypothesized structural model provides a good fit to the data. Firstly, the Likelihood Ratio Chi-squared Test (model vs. saturated) is insignificant showing that there is no significant difference between the model and saturated model - assuming that all variables are correlated – and therefore indicating a good fit of the model. The Likelihood Ratio Chi-squared Test (baseline vs. saturated) is significant showing that there is a strong significant difference

between saturated model and baseline model - assuming that no variables are correlated except for exogenous variables when endogenous variables are present - and therefore indicating a good fit of the model.

Secondly, Population error measure, i.e. RMSEA is 0.038, indicates a good fit of model because RMSEA < 0.05. Thirdly, Baseline comparison measure, i.e. CFI is 0.995, and TLI is 0.958, indicates a good fit of model because CFI > 0.95, and TLI > 0.95. Finally, Size of residuals measure, i.e. SRMR is 0.003, and CD is 0.650 indicates a good fit of model because SRMR < 0.08, and CD values closer to 1.

In Table 6 the (R-squared) value of Perf (measured by Sharpe ratio) is 0.650, this value falls within the acceptable range compared with other studies in the area of financial management research. In Table 7 the stability analysis of simultaneous equation systems indicate that SEM satisfies stability condition.

Table 5: Structural Equation Model Fit Measure Assessment Model A

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms	6.876	model vs. saturated
p> chi2	0.143	
chi2_bs	632.597	baseline vs. saturated
p> chi2	0.000	
Population error		
RMSEA	0.038	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	0.085	
pclose	0.599	Probability RMSEA <= 0.05
Information criteria		
AIC	970.332	Akaike's information criterion
BIC	1117.913	Bayesian information criterion
Baseline comparison		
CFI	0.995	Comparative fit index
TLI	0.958	Tucker-Lewis index
Size of residuals		
SRMR	0.003	Standardized root mean squared residual
CD	0.650	Coefficient of determination

Note: This table provides summary of goodness of fit index.

Table 6: Summary of (R-squared)
Model A

Dep vars	Fitted	Variance predicted	Residual	R-squared	mc	mc2
Observed						
Perf2	1.22926	0.8088261	0.494598	0.5976454	0.773969	0.5990285
ExpRatio	0.005038	0.0014789	0.004187	0.1689044	0.426769	0.182132
overall				0.650173		

mc = correlation between depvar and its prediction
mc2 = mc^2 is the Bentler-Raykov squared multiple correlation coefficient

Table 7: Stability Analysis of Simultaneous Equation Systems
Model A

Eigenvalue	Modulus
0 + .2846947i	0.284695
0 - .2846947i	0.284695

Stability index = .2846947
All the eigenvalues lie inside the unit circle.

SEM satisfies stability condition.

7. Conclusion

In this paper, we show that there exists a negative relation between fund fees and fund performance. We subject it to a battery of robustness tests, and find that it survives all of them. We first estimate the equation using the expense ratio as our measure of mutual fund fees. A test of the equilibrium relation between mutual fund fees and performance can be carried out by regressing expense ratios on fund performance as specified in equation or, alternatively, by running a regression of fund performance on expense ratios. We optimize for the former approach for two reasons.

The first reason has to do with comparability of results, since a number of studies have regressed different measures of performance typically expense ratios (e.g., Carhart, 1997; Chevalier and Ellison, 1999). The second reason has to do with the statistical properties of the coefficient estimates. Since funds' true alphas are not observed, estimated alphas are used instead, so our measure of fund performance contains a significant amount of measurement error. Therefore, if performance is included as a regressor, its estimated coefficient will be biased towards zero because of the attenuation bias induced by measurement error. Regressing expenses on estimated performance (for which we expect measurement error to be much smaller), however, yields an unbiased estimate (Levi, 1973).

In the process of obtaining our results, we bring together three different strands of research: the empirical investigation of fund performance, the analysis of fund fees, and the study of the determinants of fund governance.

Although there are performance studies that look at the effect of funds' expenses, and studies that include performance as a regressor, the main contribution of this paper is to provide evidence through robust statistical analysis around the usefulness of the examination of the causality relation between the three variables Mutual Fund Fees, Board Structure, and Performance.

This paper conclude that all of the hypothesized relationships are supported (e.g. ExpRatio is negatively associated with Perf, InvComm is positively associated with Perf,, Bsize is negatively associated with ExpRatio, DirOwn is positively associated with ExpRatio, DirTn is positively associated with ExpRatio, ProfDir is negatively associated with ExpRatio, and CGQ is positively associated with ExpRatio).

Our results have important consequences both for investors and for regulators. The results provide further evidence that high fund fees do not generally pay for commensurately high risk-adjusted returns. On the contrary, high fees may be a signal of poor performance. Therefore, our results argue for the design of mutual fund disclosure requirements that take into account the cognitive limitations of investors.

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