Antecedents of Equity Fund Performance: A Contingency Perspective

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While the fund performance management literature has clearly documented that the fund size, fund family size, and net cash flow are important antecedents of equity fund performance, prior empirical studies have revealed mixed results that have not been adequately explained. Through the lens of the contingency perspective, we developed a conceptual model that examines how the expense ratio and management compensation as contextual factors interact with the fund size, fund family size, and net cash flow to affect equity fund performance. The empirical analyses were based on panel data including 690 equity funds in China over a 7-year period from 2009–2015. The results show that the expense ratio and management compensation moderate the effects of the fund family size and net cash flow on fund performance, and management compensation also moderates the relationship between the fund size and fund performance.

Keywords: fund size; fund family size; net cash flow; expense ratio; management compensation; equity fund performance; Chinese mutual fund
JEL Classifications: G11, G23

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1. Introduction

A rich body of literature on equity fund performance has discovered several key antecedents to performance, including, most notably, fund size (Indro et al., 1999; Otten and Bams, 2002; Dahlquist et al., 2000; Chen et al. 2004; Gallagher and Martin, 2005), fund family size (Chen et al. 2004; Ferreira et al. 2013), and net cash flow (Ippolito, 1992; Sirri and Tufano, 1998; Guercio and Tkac, 2002; Berk and Green, 2004). However, the findings of prior studies are mixed, and the reasons for the inconclusive results have not been adequately addressed in the literature. For example, the relationship between fund size and fund performance has been greatly debated. Indro et al. (1999) and Otten and Bams (2002) find that a positive relationship exists between fund size and fund performance for US and European mutual funds. In contrast, Grinblatt and Titman (1989), Perold and Salomon (1991), Chen et al. (2004), and Yan (2008) document a significant inverse relationship between fund size and fund performance. However, Carhart (1997) and Grinblatt and Titman (1994) report no significant relation between fund size and fund performance in the USA. This relation is also absent in the Australian context, as reported by Bird et al. (1983), Gallagher (2003), and Gallagher and Martin (2005), and in the Swedish context, as reported by Dahlquist et al. (2000). Regarding the relationship between fund family size and fund performance, Chen et al. (2004) and Ferreira et al. (2013) reveal that the positive effect of family size on performance is pervasive around the world. However, fund family size may not always be associated positively with fund performance. For example, Ang and Lin (2001) find that the evidence supporting economies of scale in the mutual fund industry is weak. Evidence regarding the effect of net cash flow on fund performance is inconclusive. Gruber (1996) proposes a smart money hypothesis and suggests that cash flows should have a positive correlation with future fund performance, and Zhen's (1999) study supports his

hypothesis. However, Sapp and Tiwari (2004) disagree, and although Ferreira et al. (2013) find no statistically significant relation between cash flows and fund performance in a sample of US funds, they find evidence of a positive relationship for non-US funds.

From a contingency perspective, the present study examines how expenses, including the expenses for management compensation, may increase or decrease and may even diminish the effects of fund size, fund family size, and net cash flow on the equity fund performance in China. In doing so, this study makes three contributions. First, this is one of first studies to adopt the contingency theory approach to explain how the different conditions of expenses and management compensation may alter the effects of fund size, fund family size and net cash flow on equity fund performance. This approach helps to clarify controversial findings reported prior empirical studies, adding knowledge to the fund performance management literature. Second, this study explores the interactions among key antecedents of equity fund performance, i.e., how expense ratio and management compensation interact with fund size, fund family size and net cash flow to affect equity fund performance. The current equity fund performance literature lacks conclusive insights on this issue. Third, with a unique dataset of Chinese mutual funds, this is one of the first empirical studies to elucidate the determining factors of equity fund performance in the Chinese context.

2. Theoretical Foundation and Hypothesis

2.1 *Conceptual framework*

There is a rich body of literature explaining how fund characteristics, such as fund size, fund family size, various fees and expenses, loads/management fee, and cash flows, can contribute to future fund performance (Jensen, 1968; Grinblatt and Titman, 1989; Ippolito, 1989; Hendricks, Patel, and Zeckhauser, 1993; Brown and Goetzmann, 1995; Malkiel, 1995; Gruber, 1996; Carhart, 1997; Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Zheng, 1999), although the findings are mixed and often contradictory. To understand when these key

variables (fund size, fund family size and net cash flow) contribute to or have a detrimental effect on the fund performance, we develop and empirically test a contingency conceptual framework by incorporating expense ratio and management compensation as contextual variables to explain the variations in the relationship between fund performance and its popularly examined antecedents – fund size, fund family size, and net cash flow.

Contingency theory is widely used in organizational studies. This theory advocates that there is no single best way of organizing as organizations are open systems that need careful management to satisfy and balance internal needs and to adapt to environmental circumstances, achieving alignment and good fit between the two (Morgan, 2007; Scott, 1981). The contingency theory applied to the organizational performance management postulates that there is no universally appropriate performance management system that applies to all organizations with all conditions; instead, particular aspects of each individual organizational system and its effectiveness will depend on specific contextual factors of the organization (Otley, 1980; Rejc, 2004; Wadongo and Abdel-Kader, 2014). Therefore, the contingency theory suggests that there are specific situational or contextual factors that can affect the direct relationships between independent and dependent variables in the study of organizational performance. In this study, we borrow this underlying principle of contingency theory of performance management in organizational studies to investigate how the context of equity fund management might help explain the contradictory findings of prior studies on fund performance noted above. Figure 1 depicts the main factors that may affect equity fund performance and the moderating roles of the expense ratio and management compensation.

Insert Figure 1 about here

2.2 *Fund size and fund performance*

Fund size refers to the net assets under management (Indro et al. 1999). The relationship between fund size and performance has been greatly debated. For certain segments, fund size simply does not affect fund performance. For example, fixed-income funds that own fixed income securities such as US Treasuries, municipal bonds or investment grade corporate fixed income securities should produce consistent returns regardless of their size. However, for non-fixed-income funds, prior studies generally support an inverse relationship between fund size and performance, although overall findings are mixed. Chen et al. (2004) reveal an inverse relationship between fund size and returns for various performance benchmarks attributed to the adverse scale effects regarding a lack of liquidity and organizational diseconomies. Yan (2008) also report a significant inverse relationship between fund size and fund performance for US equity mutual funds. Grinblatt and Titman (1989) find evidence that fund returns decline with fund size. Perold and Salomon (1991) contend that large funds are not as flexible as small funds in divesting the illiquid stocks, thus exhibiting diminished performance because of the higher trading costs associated with illiquid stocks. Therefore, the perception that fund size can impede performance is a valid concern in financial market, as Grossman (1976) and Grossman and Stiglitz (1980) argue that information acquisition and trading are costly. Mutual fund managers who efficiently (inefficiently) expend money to acquire and act on information should experience positive (negative) risk-adjusted returns net of expenses.

In contrast, Indro et al. (1999) report fund size as a positive performance determinant in the USA. Otten and Bams (2002) also show a positive relationship between size and fund abnormal performance for European mutual funds. It is believed that when fund size increases, the transaction volume may also be increase; therefore, growth in size should provide cost advantages as net return increases. This effect occurs because the costs of access to data and research services as well as administrative and overhead expenses do not increase in direct proportion to fund size (Indro et al. 1999). However, Carhart (1997) and Grinblatt and Titman

(1994) report no significant relation for funds in the USA. The relation is also absent in Australia, as reported by Bird et al. (1983), Gallagher (2003) and Gallagher and Martin (2005), and in Sweden, as reported by Dahlquist, Engstrom and Soderlind (2000).

2.3 *Fund family size and fund performance*

Most mutual funds are members of fund families, and each fund family runs diversified equity funds or other funds (Nanda et al. 2004). Studies report that the management of large funds is less efficient (Abinzano et al. 2010) and diseconomies of scale erode the fund performance (Chen et al. 2004). However, fund performance may be changed when considering the fund family factor. Chen et al. (2004) find that the return of larger funds is lower, while that of larger fund families is higher. Yan (2008) also demonstrates the positive influence of fund family size on fund performance. The positive relationship between fund family size and fund performance is attributed to the decreasing search cost due to the advantage of brand marketing (Gaspar et al. 2006); economies of scale to the distribution, servicing, and promotion of funds (Nanda et al. 2004); and better management and strategic fund portfolio building (Pollet and Wilson, 2008). Based on the economy of scale, it is expected that the greater the assets of the fund families, the more possible it will be for funds to reduce the expenses, for example, reducing the fixed costs (Chen et al. 2004; Warner and Wu, 2011), resulting in an increased return.

2.4 *Cash flows and fund performance*

Cash flow is the new money flowing into the funds based on new investment from investors. Cash flows and the assessed performance of mutual funds have received considerable attention as researchers question whether a fund's future performance is related to its past performance (Spitz, 1970; Sawicki, 2000). A positive relation between past fund performance and cash flow is well documented in the literature. Both flows and past performance contribute to the growth

rate of a fund. Hendricks, Patel and Zeckhauser (1993) find that funds with strong recent past performance report better future performance. While Ippolito (1992) as well as Sirri and Tufano (1998) reveal that recent poor performance does not lead to outflows from retail funds in the USA, Sawicki (2000) reports investors moving moneys out of poorly performing Australian wholesale funds, as do Guercio and Tkac (2002). Berk and Green (2004) indicate that fund inflows can erode the performance of mutual funds. There is little doubt that past performance is typically regarded as a key input into investor decisions and that investors tend to chase past fund performance (Spritz, 1970; Patel et al., 1994). In a subsequent study, Barber et al. (2003) also find that investors use past returns as positive signals of fund quality and future performance. Survey research shows that past performance is the most important factor that investors consider when selecting a managed fund investment (Sweeney Research, 2001). It is logical to suggest that new money flowing into the funds may result in bigger fund size, more management fees, and more associated expenses. Nanda et al. (2004) also suggest that there is a significant spillover effect between funds in a family that a good performance by a fund enhances cash inflow to other funds in the family.

2.5 *Fund size and fund performance: The moderating role of expense ratio*

Although there are compelling studies that argue for the negative and positive relationship between fund size and performance (Dahlquist et al. 1999), the central argument of the relationship is whether the economies of scale are taken advantage of by the fund manager; a successful manager may capture excess return by charging more per dollar managed, thus increasing expense ratios; alternatively, the fund may increase in size, with resulting diseconomies of scale such as greater transaction costs and organizational diseconomies. Meanwhile, studies on the trading costs and size for mutual funds present indirect supporting

results with respect to the scale of economies (Chen et al. 2004; Christoffersen et al. 2006; Pollet and Wilson, 2008).

Grossman and Stiglitz (1980) and Engstron (2003) stated that while informed investors are expected to earn greater gross and risk-adjusted returns, they also incur more expenses due to the costs associated with acquiring information. However, the above studies provide little evidence of the relationship among fund size, fund performance and expenses as trading cost may not capture the total expense ratio. In practice, fund managers may prefer to manage small funds because the small fund size enables them to move quickly into and out of stocks. In addition, managing a large fund is likely to involve more challenges.

When a fund grows, it may incur excessive costs resulting in diminishing or even negative marginal returns. Operating funds in China incur different operating expenses, including management fees or advisory fees, custodian fees, fees charged by the transfer agent, sales service fees, etc. It seems logical that these costs could grow at the same rate as the fund assets. If the economy of scale does exist in Chinese mutual funds, costs of the funds are likely to decrease with the increasing fund size because costs as sunk costs, marketing and research costs are not directly proportional to fund size. However, as funds grow, the fixed amount of costs does not account for a significant portion of the total cost, whereas banks' custody fees, commission fees and broker fees may play an increasingly important role.

It is conceivable that a large fund company could incur higher management expenses and transaction costs as it increases in size (Loeb, 1983). However, China regulation states that equity funds have to invest no less than 80% of their assets in equity. Given the nature of the Chinese stock market, most fund managers have to adopt an active trading strategy to achieve their investment goals, resulting in higher transaction and trading costs. Furthermore, the inability to trade information or implement proprietary investment strategies erodes fund performance (Indro et al., 1999). As the fund size increases, the fund becomes more difficult

to actively manage. Fund managers need to spread the assets over a larger number of stocks as required by regulators and simply because investing large amounts in one particular stock may affect the share price, ultimately increasing expenses and reducing the return. Therefore, we propose the following hypothesis:

Hypothesis 1: *There is a negative relationship between the fund size and equity fund performance when the expense ratio is high.*

2.6 *Fund size and fund performance: The moderating role of management compensation*

In China, when investors purchase shares of a fund, the management fee is fixed and included in the mandatory clause regardless of the losses or gains of the fund. For example, before 2001, the management fee for a closed-end fund was 2.5%; subsequently, this fee was reduced to 1.5% for both closed- and open-ended funds and has been maintained at this same level to date. Most management fees are paid to the fund managers as a part of their management compensation. Therefore, a positive relationship is expected to exist among the fund size, management fee and management compensation.

It is logical that well-performing funds may attract new money. When the fund assets increase, the management fee may also increase, resulting in an increase in management compensation. The compensation of fund managers acts as an incentive for them to act in investors' interests because management compensation is based on the amount of money gained from the management and performance of the fund (Dowen and Mann, 2004). Even managers who do not receive performance-based compensation may be concerned with fund performance because, generally, poor returns decrease income from fund management, decrease investment in the fund and decrease the net assets of the funds. Despite the widespread belief that Chinese fund managers lack skills, in the literature, evidence is provided supporting managerial skills in the Western world (Grinblatt and titman, 1989; Jiang et al. 2014; Berk and Binsbergen, 2015)

in which managers' skills contribute to fund performance. A recent study conducted by Feng and Johansson (2015) determined that Chinese mutual funds possess stock selection ability in China's IPO market, further developing good equity returns after a three-month lock-up period. Furthermore, investors appear to be able to identify and correctly reward this skill, resulting in higher aggregate fees (Berk and Binsbergen, 2015). Therefore, we propose the following hypothesis:

> **Hypothesis 2**: *There is a positive relationship between fund size and equity fund performance when management compensation is high*.

2.7 *Fund family size and fund performance: The moderating role of expense ratio*

From an economy of scale point of view, fund expenses always represent an important factor driving fund performance (Carhart 1997). In contrast to certain members of a fund family, the economies of scale and scope might not be present at the fund level; however, such economies of scale and scope could be achieved by the fund family's structure due to the possible distribution, servicing and promotion of funds (Nanda et al., 2004). Large fund families with good reputations likely to help their investors to feel reassured about their selection of funds. Even if the investors do care about the high expense fees associated with large funds, choosing to withdraw from the fund, which may result in decreased fund size, eventually weakens the negative effects of fund size on fund performance.

A fund family would be expected to have rather diversified products. This is even more so for a larger fund family. Studies of diversified funds in the same fund family with different objectives usually have different portfolio managers and are designed to attract different clienteles (Baumol et al. 1990; Dermine and Roller 1992). By incorporating transaction costs such as the expense ratio as inputs to measure mutual fund performance, economies of scale may decline due to large fund's inability to economize the information costs it expended (Choi

and Desai, 1997). For example, economies may not be significant when the stock's individual component is larger, which may decrease the diversification effect, causing fund managers to need to spend more effort and time to analyse the dollar invested. Further, different funds in the same fund family may not share the same cost structure, and competition among fund managers may offset expected economies from administration, marketing, and other back office operations (Ang and Lin, 2001).

Further, in most fund families, major decision making is likely to be decentralized in that the fund managers make investment decisions without substantial coordination with the managers of other fund family members. In a sense, a fund family is simply an organization that credibly commits to allowing each of its fund managers run his or her own assets (Chen et al. 2004).

As permitted by CSRC (China Securities Regulatory Commission) rules, Chinese fund family companies may delegate fund product distribution to commercial banks, security firms, security investment advisory firms, specialized fund sales agencies and other institutions. The more distribution agents, the better the coverage of the funds' products, and the higher the expense ratio. By using the number of fund distributors as a measurement of market power, Liu and Sathye (2016) find a significant and positive relationship between fund efficiency and market power, suggesting that large fund family companies in China use market power to reap efficiency dividends even at a higher cost.

In the context of Chinese mutual funds, the fund families may have strong political orientations due to various direct and indirect associations with the political or government regime. Larger fund families can easily grab "policy resources" and develop regulatory-driven products with strategic orientations, which could result in poorly designed products with limited long-term appeal to investors (Edelmann et al. 2014). Moreover, Chinese investors are considered rather fickle and often change their investments, possessing psychological biases

that have influence on behavioral biases (Li and Yeh, 2011). In China, fund products are bought and then sold; the buy-and-hold strategy is not common in this market. As a result, marketing and reputation management is significantly less effective than that in the West. Therefore, economies of scale may not appear at the fund family administration level. We propose the following hypothesis:

Hypothesis 3: *There is a negative relationship between the fund family size and equity fund performance when the expense ratio is high.*

2.8 *Fund family size and fund performance: The moderating role of management compensation*

Since the management compensation for fund managers' services is usually based on the size of the fund, the associated cost for the management compensation is likely to grow at the same or a similar rate as that of fund assets. If the economies of scale and scope do exist in a Chinese mutual fund, it must be at the family level. Costs of the funds may decrease with inclusion in a fund family because marketing campaign and research costs are not directly proportional to fund size but, rather, to fund family size (Yan, 2008).

Although the Chinese mutual fund industry has grown fast, alarm bells are ringing over the performance of more than 3,000 fund products in the mutual fund sector. According to Securities Times, the China mutual fund houses had 1,320 asset managers operating 3,049 funds in 2016. What is worse is that the fund family continues to suffer a brain drain due to the high turnover of fund managers (Wei, 2016). Therefore, to achieve better fund performance, a fund family is likely to recruit high talent with high-level management commitment and skills to manage the fund by providing a high-level compensation program, which leads to a positive effect on the relationship between fund family size and equity fund performance. Therefore, we propose the following two hypotheses:

Hypothesis 4: *There is a significant positive relationship between fund family size and equity fund performance when management compensation is high*.

2.9 *Net cash flow and fund performance: The moderating role of expense ratio*

The nature of open-ended equity funds allows investors to purchase and redeem the funds randomly; therefore, cash flow becomes a sensitive issue in addressing this requirement. It is natural to consider that well-performing fund is likely to induce greater cash inflow, which results in enlarged fund size and fund management fee. It is well documented that investors appear to respond asymmetrically to the performance of a strongly performing fund, which attracts a disproportionate inflow of new money relative to the cash outflow when performance is poor (Nanda et al. 2004). This phenomenon could be explained by the facts that investors are reluctant to realize losses by selling underperforming funds (Odean 1998), the asymmetry in terms of switching costs (Ippolito 1989), marketing expenditures (Sirri & Tufano 1998), and even investors' psychology (Goetzman & Peles 1997, Barber et al. 2005). If the fund flows are less sensitive to poor performance, does that mean investors are more sensitive to the expenses of the fund? It is natural that investors are attracted to lower expenses, which, in turn, results in an influx of new money.

Most Chinese investors are not professionally trained to identify the factors that should be considered when selecting a fund. Therefore, these investors must rely on obvious factors, including the fees that must be paid when purchasing a fund, namely, subscription fee, purchase fee, redemption fee, and management fee. These fees are easy to understand and are more salient than the operating expenses that are incurred as the fund company manages funds. Clearly, Chinese investors avoid high purchase and management fees. In addition, these investors may even remain in funds that have poor performance simply because of the high redemption fee.

While fund size has been recognized as an important factor affecting fund performance, it detracts from performance according to theoretical and empirical evidence (Chen et al. 2004). However, it is unclear whether lower expenses lead to more new money and further affect the fund performance. Irrespective of these possible explanations regarding the evidence of an asymmetric or negative relationship between cash flows and fund performance, a possible lack of consistent performance and the reluctance of investors to realize their losses give rise to the following hypothesis:

> **Hypothesis 5**: *The positive relationship between net cash flow and equity fund performance is stronger when the expense ratio is low.*

2.10 *Net cash flow and fund performance: The moderating role of management compensation*

New money may flow into the funds with recent good performance. However, a few studies report that after increasing with the injection of additional money, funds with good recent returns cannot sustain their performance (Carlson, 1970; Dunn and Theinsen, 1983; Jensen, 1969, Tng, 2005). Although past performance and the flow of funds based on past performance may not be useful determinants of future performance, the amount of assets under management might affect fund performance. Further, fund managers are compensated proportionately to the amount of assets under management. This condition can mean that the managers may be rewarded or penalized by clients based on their performance.

Prior studies have revealed that investors appear to respond asymmetrically to the performance of a fund (Nanda et al. 2004). Goetzmann and Peles (1997) support these findings by providing behavioral evidence on fund investors. Barber et al. (2005) also found that investors learned more quickly about front-end-load fees, which are large, salient, one-time fees, than operating expenses, which are smaller, ongoing fees that are easily masked by the

volatility of equity returns (Barber et al 2005). In China, small and unsophisticated fund investors usually weigh the fund brand or family size more than the actual return of the funds. This observation is supported by Feng et al (2014), who conducted research showing that Chinese investors generally have no mutual fund selection ability. Furthermore, the fund company does not advertise that its funds performed poorly, and those investors may face the redemption fees charged if they withdraw their money; hence, investors' money may be "locked in" with the fund. Since managers are paid a share of fees generated by their specific funds, the aggregate amount of the fees is primarily determined by the behavior of the fund's investors. Therefore, we propose the following hypothesis:

> **Hypothesis 6**: *The positive relationship between net cash flow and equity fund performance is stronger when management compensation is high.*

3. Research Methods

3.1 *Data description*

The development of the Chinese mutual fund market can be best described by the following three stages: the exploration stage (1991–1997), the experimental and learning stage (1997–2004) and the growth stage (post 2004 period). After 2006, the industry experienced rapid changes as financial markets opened up further as the listing of state-owned banks was permitted. Meanwhile, the Chinese government lifted restrictions on currency trading and capital flows in and out of China. Fund management companies were also allowed to invest in off-shore (overseas) markets under the Qualified Domestic Institutional Investor (QDII) scheme. Nevertheless, such rapid growth slightly declined as the Chinese economy was inversely affected by the GFC in 2008, and the Chinese mutual fund industry underwent structural changes. By the end of 2009, the Chinese fund industry recovered and continued to grow. Therefore, our sample data includes Chinese equity mutual funds between 2009 and 2015; yearly data were obtained from the CSMAR (China Stock Market & Accounting

Research) database. We applied a constraint to arrive at our final sample, i.e., equity funds that launched after December 2015 are excluded from the dataset to ensure that each fund has at least 1 year of data. Therefore, 698 equity funds are included in the sample; shares are invested in these funds from China's two stock markets and other international markets. The Shanghai SE composite index and China 1 year fixed term deposit rate were obtained from Datastream and used to calculate the risk-adjusted return and beta. Other Chinese market indices that include style index, large and small capitalization index and book to market index are provided by Chinese Investment Information Services Limited. Since no funds have been de-listed in the Chinese market, the sample is free of survivor bias.

3.2 *Empirical model and method*

To test the hypotheses, hierarchical moderated multiple regression analysis is applied. Therefore, the following regression model is tested.

$$Alpha_{i,t} = \alpha_0 + \sum_{K=1}^{5} \beta\ Control\ Variables_{iK} + \sum_{L=1}^{3} \beta\ Independent\ Variables_{iL} + \sum_{M=1}^{2} \beta\ Moderating\ Variables_{iM} + \sum_{N=1}^{6} \beta\ Interaction\ Terms_{iN} + \varepsilon_{it} \quad (1)$$

where i=1, 2, …, n refers to a cross-section unit (equity fund) and t=1, 2, …, t refers to an annual period (2001–2015). *Alpha* is defined as the excess return for fund *i* measured by the performance model at year t; α_0 represents the constant term. Control variables include age of fund, daily purchase fee, daily redemption fee, share market return, and QDII, and the age of the fund is included as a control variable. Independent variables represent fund characteristic variables under examination (L=1 for fund size, 2 for fund family size, and 3 for net cash flow). M represents the moderating variables (M=1 for management compensation, and M=2 for expense ratio). N represents the interaction term (1 for fund size × expense ratio, 2 for fund

size × management compensation, 3 for fund family size × expense ratio, 4 for fund family size × management compensation, 5 for net cash inflow × expense ratio, and 6 for net cash flow × management compensation). The coefficient β measures the sensitivity of each of these variables to the dependent variable. As in Edelen et al. (2013), we use lagged independent variables to obtain a predictive analysis and to avoid concerns of reverse causality.

3.3 *Variables and measurements*

3.3.1 *Dependent variable*

Equity fund performance is the dependent variable and is measured using the proxy *Alpha* (i.e., Jensen's *Alpha*) which is a measure of the difference between a fund's actual annual excess returns and its expected annual excess returns that is based on the fund's sensitivity (beta) to the excess returns of the benchmark index.

Jensen's *Alpha* measure is the average return for the fund over and above what is predicted by the CAPM given the portfolio's beta and the average market return. Jensen's measure is the fund's *Alpha* value, which is computed as follows:

$$\alpha_p = (\bar{r}_p - \bar{r}_f) + \beta_p(\bar{r}_m - \bar{r}_f)$$
$$= \bar{r} - [\bar{r}_f + \beta(\bar{r}_m - \bar{r}_f)] \quad (2)$$

where $\bar{r}_p$ is the fund return, $\bar{r}_f$ is the risk-free rate of China's one-year deposit rate, $\bar{r}_m - \bar{r}_f$ is the market excess return, and β is the slope. If the CAPM holds in equilibrium, then it is expected that the intercept term will be zero (i.e., $\alpha_p = 0$). If a fund is performing to expectations (relative to the CAPM), then α_p will be zero. Superior performance is indicated by a positive value of α_p, while underperformance is demonstrated by a negative value of α_p.

In addition, a proxy for equity mutual fund performance, the net asset value (NAV) return of the fund, is used as an additional measure of the return to be tested. The NAV return is calculated considering the dividend effect in terms of the net asset value. The annual NAV

return is computed as the NAV at the end of a period over the NAV at the beginning of the period with cash dividend effects.

Further, Fama and French's (1992) three-factor model of excess returns is computed and used as an additional test of the regression analysis. The following regression is estimated to obtain the factor loadings (betas) and excess returns (alphas) for each fund:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,EMR} EMR + \beta_{i,SMB} SMB + \beta_{i,HML} HML + \varepsilon_{i,t} \quad (3)$$

where $R_{i,t}$ is the return of *i*th fund in year *t;* $R_{f,t}$ is the one-year inter-bank rate; EMR is the yearly excess market return, which is computed as $EMR = R_{m,t} - R_{f,t}$ ($R_{m,t}$ is the yearly return on the market factor based on the Shanghai Composite Index); SMB (small minus big) is the yearly return on the size factor, which is the difference in returns on the Shanghai Small-cap Index and the Shanghai Large-cap Index; HML (high B/M minus low B/M) is the yearly return on the book-to-market factor, which is the difference in returns on the Value Index and the Growth Index; α_i is the three-factor model excess return; β_i is the factor loading and $\varepsilon_{i,t}$ is the residual for *i*th fund in year *t*.

3.3.2 *Independent variable*

Fund size: The logarithm of total net assets (TNA) is used to measure fund size.

Fund family size: Family size is measured as the logarithm of the sum of all net assets that are managed by a particular fund management company.

Net cash flow: The cash flow of the purchase and redemption fees is measured by the changing rates of net flows, which are computed as follows in alignment with Nanda et al. (2004):

$$Net\ cash\ flow_{i,t} = \frac{Net\ asset_{i,t} - Net\ asset_{i,t-1} \times (1 + R_{i,t})}{Net\ asset_{i,t-1}} \quad (4)$$

where $Net\ cash\ flow_{i,t}$ is the *i*th fund's flow changes over the period of one year, $Net\ asset_{i,t}$ is the *i*th fund's net assets at year *t*, $Net\ asset_{i,t-1}$ is the *i*th fund's net asset at

year *t-1*, and $R_{i,t}$ is the rate of the return of fund *i* over a one-year period. The net cash flow rates represent new money, the cash flows of a fund, or the growth rate of new money. Here, we assume that new money flows into and out of each fund at the end of each period since we do not know the exact timing of cash flows.

3.3.3 *Moderating variable*

Expense ratio: Indro et al. (1999) identified the expense ratio as the proportion of fund assets paid for operating and managing expenses. In this study, the expense ratio includes operational and transaction expenses, such as administrative expenses; distribution expenses; marketing, sales, or service expenses; custody fees; and all other costs incurred by the fund that affect total assets but excluding management fees.

Management compensation: This variable is calculated as the logarithm of the remuneration paid to fund managers and their performance rewards.

3.3.4 *Control variable*

To avoid alternative exanimations of the empirical results, we included a number of control variables when performing statistical procedures. These variables include the age of fund, daily purchase fee, daily redemption fee, share market return, and qualified domestic institutional investor (QDII). Prior studies suggest that fund characteristics, such as age of fund, management fee (e.g., daily purchase fee, daily redemption fee), and share market returns (Jensen, 1968; Grinblatt and Titman, 1989; Ippolito, 1989; Hendricks, Patel, and Zeckhauser, 1993; Brown and Goetzmann, 1995; Malkiel, 1995; Gruber, 1996; Carhart, 1997; Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Zheng, 1999), and fund investment policies such as the QDII (Liu and Sathye, 2016) can contribute to fund performance.

A*ge of fund* is measured by the number of years since the fund was launched. The effect of the age of the fund is controlled for through the dependent variable because of its potential effects on fund performance. *Daily purchase fee* is one of the types of sales commissions paid at the time of the purchase. The amount of this fee depends on the amount the investor contributes. An average rate is used and is calculated for the different levels of investment. *Daily redemption fee* refers to a type of sales commission that is paid when an investor sells (or redeems) shares. The amount of this fee depends on how long the investor has held the shares and may decrease to zero if the investor holds shares for a sufficient period of time. An average rate is used and is calculated for the various holding periods of the funds. *Share Market Return* refers to the China Shanghai Composite Index return. *QDII* is coded as a dummy variable. QDII takes the value of "1" when the funds are allowed to invest in major international markets (named as QDII fund) and "0" otherwise.

3.3 *Empirical results*

3.3.1 *Descriptive statistics*

Table 1 presents the Pearson correlation coefficients between the variables. Overall, the correlations between the independent variables are relatively low. The two performance measurements (NAV return and market model excess return) present a correlation of 75.4%. The coefficients for most variables are below the 0.600 cut-off point and are acceptable (Churchill 1991). We also identified that the correlation coefficient between fund size and management compensation is slightly above the cut-off point. Thus, we further checked the correlation coefficient with the variance inflation factor (VIF) when performing the regression analysis procedures. The VIF signifies the degree to which each independent variable is explained by the other independent variable, and all variables are found well below the suggested cut-off point of 10, suggesting that multicollinearity is not a significant concern in the data (Hair et al., 1998).

Table 2 provides the fund-level summary statistics of the sample of 690 equity funds between 2009 and 2015 (2327 fund-year observations). Overall, in China, equity mutual funds achieved a 5.7% average annual risk-adjusted return and 9.7% annual NAV return with the dividend effect considered for the 7-year period only between the average arithmetic return on Shanghai Composite (8.8%). The lowest and highest average arithmetic fund returns were recorded in 2011 and 2014, respectively. However, the minimum and maximum return for these two proxies of returns range from –1.304 to 1.809, indicating highly volatile returns, which is consistent with China's overall stock market performance.

Both the fund size and fund family size are measured by the total NAV and assets in Chinese Yuan. The largest fund family company manages approximately ¥673.930 billion in assets. The average fund family size and fund size are ¥114.708 billion and ¥2,158.105 million, respectively. The average fund in the sample annually has an expense ratio of 1.2%. Altogether, the average fund pays a total of approximately ¥22.11 million for management compensation. The net cash flow is measured as the percentage of the growth in total assets under management. Annually, on average, the examined equity funds experience new money growth of 43.9%, which is much higher than the growth rate of China's GDP. The average daily purchase fee is 0.638%, and the maximum purchase fee is 1.5%. The average redemption fee is 0.307%, and the maximum redemption fee is 0.833%.

Insert Table 2 about here

3.3.2 *Effects of independent variables*

Table 3 and Table 4 present the moderated hierarchical regression results for the dependent variables of *Alpha* (risk-adjusted excess return) and *NAV* returns, respectively. The interpretations of the results are based on Model 10 (full model) in Table 3, which controls for

all other variables in the model. The results presented in Table 4 resemble the results shown in Table 3. The graphical presentations of the moderation effects are shown in Figures 2-7.

Insert Table 3 and Table 4 about here

Insert Figure 2 to Figure 7 about here

With the three antecedents of equity fund performance, the results presented in Table 3 show that there is a statistically non-significant relationship between the fund size and equity fund performance ($\beta = 0.000$, $p = 0.990$). This result is in line with several prior studies in which no significant relationship was found (Bird et al., 1983; Grinblatt and Titman, 1994; Carhart, 1997; Dahlquist et al., 2000; Gallagher, 2003; Gallagher and Martin, 2005), but it differs from other studies revealing a positive relationship (Indro et al., 1999; Otten and Bams, 2002) and a non-significant inverse relationship (Grinblatt and Titman, 1989; Perold and Salomon, 1991; Chen et al., 2004; and Yan, 2008).

There is a negative and statistically significant relationship between the fund family size and equity fund performance ($\beta = –0.152$, $p = 0.000$), providing evidence confirming prior studies (Ang and Lin, 2001; Banko et al. 2010) showing that the scope economy in the equity mutual-fund industry is weak.

The relationship between net cash flow and equity fund performance is significant and positive ($\beta = 0.083$, $p = 0.000$). This result is in line with prior studies (Gruber, 1996; Zhen, 1999) but in contrast with Sapp and Tiwari (2004), who found a negative relationship, while Ferreira et al. (2013) were unable to find any significant connection.

The main effect results revealed in the present study together with those of prior studies failed to describe a precise and conclusive relationship between the key antecedents and equity fund performance under investigation in this study. This shortcoming suggests that a further investigation, as in this study, looking into the context of the relationships is necessary. The findings reported below in relation to the hypotheses of this study may help us to understand

precisely how the equity fund performance is related to fund size, fund family size, and net cash flow.

Table 3 also shows that the expense ratio (moderator) has a significant negative relationship with the equity fund performance ($\beta = -0.107$, $p = 0.000$), suggesting that a fund with less operating expenses may yield a better return. Management compensation (moderator) has a significant positive relationship with equity fund performance ($\beta = 0.203$, $p = 0.000$), suggesting that a fund paying higher management compensation generates better returns.

3.4 *Hypothesis testing results and discussion*

In Hypothesis 1, we anticipated that the relationship between the fund size and equity fund performance would be positive when the expense ratio is low. The results show that the interaction between the expense ratio and fund size has a non-significant negative effect on equity fund performance after controlling for all main effects. Figure 2 shows that the relationship between the fund size and equity fund performance is positive when the expense ratio is low, but there is a negative relationship between the fund size and equity fund performance when the expense ratio is high ($\beta = -0.024$, $p = 0.266$). This result is consistent with the hypothesis, but statistically, there is not enough evidence to support Hypothesis 1.

In Hypothesis 2, we anticipated that the relationship between the fund size and equity fund performance would be positive when management compensation is high. The results show that the interaction between management compensation and fund size has a significant positive effect on the equity fund performance after controlling for all main effects ($\beta = 0.055$, $p = 0.007$). Figure 3 demonstrates that the relationship between fund size and equity fund performance is positive when management compensation is high, whereas the relationship becomes negative when management compensation is low. These results provide support for

Hypothesis 2. The results also indicate that the asset-based remuneration mechanism is a good incentive to help the funds managed to achieve a better return.

In Hypothesis 3, we anticipated that the relationship between the fund family size and equity fund performance would be negative when the expense ratio is high. The results show that the interaction between the expense ratio and fund size has a significant positive effect on equity fund performance after controlling for all main effects ($\beta = 0.050$, $p = 0.022$). Figure 4 shows that the relationship between the fund family size and equity fund performance is negative when the expense ratio is high. These results provide support for Hypothesis 3. The interpretation of this moderating effect indicates that a larger fund family cannot realize economies of scale. However, this negative relationship could be weakened if the fund management company reduces its expenses. The importance of economies of scale is supported by Warner and Wu (2011), who show that the greater the assets of the fund families, the more possible it is for funds to reduce expense ratios.

In Hypothesis 4, we anticipated that the relationship between the fund family size and equity fund performance would be positive when management compensation is high. However, this hypothesis is rejected. The results show that the interaction between management compensation and fund family size has a significant negative effect on equity fund performance after controlling for all main effects ($\beta = -0.101$, $p = 0.000$). Figure 5 demonstrates that management compensation has a moderating effect on the relationship between the fund family size and equity fund performance, suggesting that higher management compensation could weaken the negative relationship between fund performance and fund family size. The possible explanation would be that a fund manager responsible for a fund generally does not have to worry about the fund family policies. His or her incentives are based on the fund performance rather than the fund family's overall performance.

In Hypothesis 5, we anticipated a stronger positive relationship between the net cash flow and equity fund performance when the expense ratio is low. The results show that the interaction between expense ratio and net cash flow has a significant negative effect on the equity fund performance after controlling for all main effects ($\beta = -0.055$, $p = 0.008$). Figure 6 shows that the relationship between net cash flow and equity fund performance is positive regardless of whether the expense ratio is high or low, and the positive relationship is stronger when the expense ratio is low. These results provide support for Hypothesis 5. It is true that a well-performing fund enhances cash inflows, which increases the fund returns. However, during this process, if fund managers or the fund company can reduce the expense ratio, the fund will perform even better. In this case, we may expect the cost efficiency or the economies of scale to be present at the fund level and even the fund family level.

In Hypothesis 6, we anticipated a stronger positive relationship between the net cash flow and equity fund performance when management compensation is high. The results show that the interaction between management compensation and net cash flow has a significant positive effect on the equity fund performance after controlling for all main effects ($\beta = 0.081$, $p = 0.000$). Figure 7 demonstrates that while the relationship between net cash flow and equity fund performance is positive regardless of whether management compensation is high or low, the positive relationship is much stronger when management compensation is high. These results provide support for Hypothesis 6. Apparently, fund managers' compensation is influenced by cash inflows driven by past returns. Managers are then paid equally for superior fund performance as well as for the returns of the fund.

In addition, both the expense ratio and management compensation are significantly and negatively (positively) related to fund performance. Research on fund expenses and performance has reported conflicting results. However, the results are consistent with the finding reported by Gil-Bazo and Ruiz-Verdu (2009) that fund performance worsens with

higher fund expenses. Age of fund is negatively associated with equity fund performance. It is possible that fund performance may deteriorate over time if the fund size increases and/or adds operational complexity. A higher daily redemption fee is associated with low equity fund performance ($p < .01$). Greene et al. (2007) find that the redemption fee is an effective tool for controlling the volatility of fund flows. It is possible that higher redemption fees could help fund managers hold less cash and generate better returns. Similarly, higher share market return is associated with low equity fund performance. This result indicates that we cannot use share market return to anticipate the equity funds' return in China. The possible reason behind this is that in China, the investment strategy is not buy and hold. A QDII fund performs positively with respect to equity fund performance ($p < .01$), i.e., funds perform better with the QDII quota. Clearly, international investigations considering the QDII scheme provide the benefit of diversification.

Behavior finance recognizes some key manager behavior patterns such as herding behavior (Sharma et al. 2015; Cuthbertson et al. 2016; Wang and Yu 2018). Since the early 2000s, the CSRC has promoted the growth of institutional investors by introducing QDII and QFII (Qualified Foreign Institutional Investor) programs. A few studies have found that the Chinese financial industry presents significant institutional herding effects in the long term, which results in a positive and significant impact on the medium-term and long-term excess stock returns (Zhu et al. 2020; Zheng et al. 2015)

3.5 *Robustness test*

We performed a robustness test using Fama and French's three-factor model of excess returns as the proxy for fund performance with the aim of testing the validity of the Fama and French's three-factor model in this particular empirical context. The results as shown in Table 5 show little support for the hypotheses and the overall model fit is not as good as that using the

Jensen's *Alpha* and NAV return as proxies for fund performance (refer to Table 3 and Table 4). Statistically, this may because the number of observations (880) for the same period is must less than the number of observations for the other two tests (2,327). Empirically, the results may cast doubt on the suitability of Fama and French's three-factor model in the context of fund performance in the emerging Chinese market, as opposed to the markets of developed country in which the Fama and French's three-factor model is much more valid. Thus, we encourage future research to search for further empirical evidence to further validate the conceptualization of this three-factor model and the measurement of open-ended fund performance in the Chinese context.

4. Limitation and Future Research

We identified two major limitations that encourage future investigations. First, in this study, we defined management compensation and the expense ratio as two context variables that explain when fund size, family fund size and net cash flow affect equity fund performance. Typically, management compensation can be part of the expense ratio on the one hand. There may be a causal relationship between the expense ratio and management compensation on the other hand; i.e., the expense ratio can be exogenous to management compensation, and then management compensation can be exogenous to equity fund performance. Thus, we encourage future research to examine how expenses affect equity fund performance via management compensation. Furthermore, we also encourage future research to investigate how management compensation may interact with the expense ratio to affect equity fund performance. This effort may help us to understand the complexity of the dynamics between management compensation and the expense ratio and their consequences on equity fund performance.

Second, since the introduction of active shares by Martijn Cremers and Antti Petajisto (2009), this method has been employed by mutual fund managers to attempt to outperform

benchmark indices. Chi (2013) suggests that Chinese fund managers' actively managed equity mutual funds outperformed passive benchmarks, indicating that fund managers possess stock picking skills and insider information, in which the US-based Asian mutual fund managers failed to possess during the Asian financial crisis (Chan and Cheng, 2003). However, Chi's study failed to identify the active shares, for example, the fraction of a portfolio or fund that is invested differently than its benchmark. Although, all-equity funds are the focus, the investment objective varied among those funds, which should be addressed. Further, Zembrowski (2018) finds that less than half of managers of Chinese equity funds outperformed their indices over several periods, which could be attributed to the volatile, idiosyncratic and opaque Chinese equity market.

Given the unique institutional setting of the Chinese fund market, for example, the Securities Investment Fund Law imposed several restrictions on investing, including requiring that 80% of investments should be in stocks and bonds, the total investment by a fund in the stock of a single listed company shall not exceed 10% of the NAV of the fund, and the total investment by all funds under the same fund management company in the securities issued by one company shall not exceed 10% of said securities (Liu and Sathye, 2016; Chi, 2013), we can extend and examine the active shares across different settings for a more insightful observation.

Future research could examine the relationship among fund size, investment style, and level of industry portfolio, management compensation, expense ratio, and active management in an international context especially an emerging market with a unique institutional setting. We believe that the extension of Cremers and Petajisto's study in an emerging market setting would help to refine our understanding of active shares and active management.

5. Conclusion

Through the lens of contingency theory approach, this study develops and empirically tests a conceptual framework that helps to understand how the expenses, including the expenses for management compensation, may explain the effects of fund size, fund family size and net cash flow on equity fund performance. More specifically, this study provides robust empirical results to reveal why the findings from prior studies are conflicting. The findings of this study suggest that the effects of fund size, fund family size, and net cash flow on the equity fund performance are contingent on expenses, including the expense paid for management compensation. The fund size may have a positive effect on equity fund performance when the expense ratio is low and management compensation is high. The size of the fund family is a negative contributor to equity fund performance in the Chinese context. However, this negative relationship could be weakened by a lower expense ratio and higher management compensation. The net cash flow remains a positive contributor to the equity fund performance regardless of how high or low the expense ratio or management compensation is. However, the positive contribution of net cash flow to the equity fund performance becomes stronger when the expense ratio is low and when management compensation is high.

This study reveals that the contingency approach may be a helpful tool for opening the "black box" and explaining the contradictory findings of prior studies. This study also suggests that four of the five control variables, including age of fund, daily redemption fee, share market return, and QDII fund, may be potential moderators providing further insights to resolve the controversial findings reported in the equity fund performance literature.

Further, the growth of the mutual fund industry in China has continued as its stock markets become more mature and increasingly integrated into the world market. Chinese fund managers may provide local knowledge and connections of distributors to their foreign partners, yet the trading behaviors are different from those of foreign fund managers. Further, Chinese retail investors prefer to buy new funds rather than units in existing ones, which also contributes to

the constant creation of new funds in the Chinese market. The distribution structure dominated by the largest Chinese banks reinforces this short-term mind-set trading behavior. From an international finance and investment perspective, this study may help us to highlight certain unexplored aspects of Chinese equity mutual funds and their similarities or differences compared to those of developed economies.

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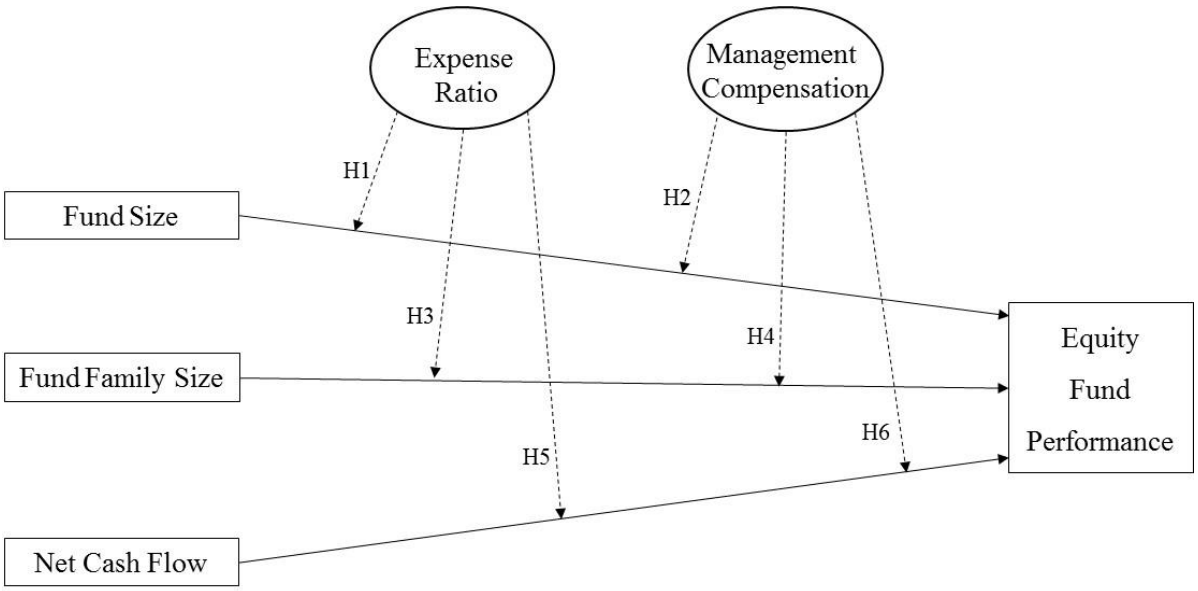

Figure 1: Antecedents of equity fund performance: The role of a contingency model

Table 1: Pairwise correlation matrix (N = 2,327)

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Alpha	1											
(2)	Fund NAV Return	0.754**	1										
(3)	Daily Purchase Fee	–0.082**	–0.034	1									
(4)	Daily Redemption Fee	–0.012	0.043*	0.215**	1								
(5)	Fund Size	–0.049*	–0.023	0.124**	0.035	1							
(6)	Fund Family Size	0.103**	0.103**	–0.151**	0.067**	0.063**	1						
(7)	Net Cash Flow	–0.005	–0.035	–0.016	–0.010	–0.010	0.013	1					
(8)	Expense Ratio	0.050*	0.017	0.101**	–0.043*	–0.148**	–0.074**	–0.019	1				
(9)	Share Market Return	0.129**	–.058**	–0.090**	0.066**	–0.075**	0.280**	0.016	0.148**	1			
(10)	Management Compensation	–0.090**	–0.035	0.273**	0.047*	0.630**	0.014	–0.008	–.136**	–0.117**	1		
(11)	Fund Age	0.072**	0.026	0.324**	–0.073**	0.227**	–0.084**	–0.024	–0.023	–0.030	0.308**	1	
(12)	QDII	–0.070**	–0.076**	0.093**	–0.041*	–0.044*	0.079**	0.012	0.005	0.002	–0.008	–0.081**	1

* $p < 0.10$; ** $p < .05$; (2–tailed).

Table 2: This table reports the yearly summary statistics of Chinese equity funds between 2009 and 2015.

Year		Alpha	Fund NAV Return	Fama and French Alpha	Age of Fund (Years)	QDII	Daily Purchase Fee (Percentage)	Daily Redemption Fee (Percentage)	Market Return	Fund Size (Net Asset Value, Million ¥)	Fund Family Size (Billion ¥)	Net Cash Flow	Management Compensation (Million ¥)	Expense Ratio
2009	Mean	0.022	0.249	–0.097	3.408	0.026	0.752	0.293	–1.061	4175.700	72.091	1.731	58.437	0.009
	Std. Deviation	0.187	0.392	0.116	3.034	0.159	0.232	0.111	0.000	5293.077	59.694	3.359	74.098	0.007
	Minimum	–0.914	–1.521	–0.278	0.083	0.000	0.000	0.000	–1.061	38.000	3.259	–0.215	0.643	0.000
	Maximum	0.472	0.759	0.679	15.667	1.000	1.500	0.500	–1.061	26000.000	265.759	36.366	366.900	0.046
	N	116.000	116.000	76.000	116.000	116.000	116.000	116.000	116.000	116.000	116.000	116.000	116.000	116.000
2010	Mean	0.030	–0.021	–0.105	3.000	0.075	0.718	0.303	0.588	3358.868	63.488	1.207	45.092	0.010
	Std. Deviation	0.180	0.211	0.101	2.949	0.264	0.227	0.114	0.000	5440.277	50.892	0.406	64.796	0.007
	Minimum	–1.304	–1.644	–0.278	0.083	0.000	0.000	0.000	0.588	36.000	1.945	0.201	0.399	0.001
	Maximum	0.429	0.230	0.679	14.750	1.000	1.500	0.600	0.588	34000.000	224.713	3.283	352.800	0.055
	N	173.000	173.000	114.000	173.000	173.000	173.000	173.000	173.000	173.000	173.000	173.000	173.000	173.000
2011	Mean	–0.205	–0.178	–0.095	3.064	0.094	0.691	0.307	–0.154	2507.811	53.675	1.212	30.722	0.009
	Std. Deviation	0.211	0.209	0.106	2.994	0.293	0.236	0.119	0.000	4476.289	43.150	0.299	49.490	0.007
	Minimum	–0.777	–0.711	–0.278	0.083	0.000	0.000	0.000	–0.154	8.700	0.580	0.613	0.107	0.001
	Maximum	0.713	0.819	0.679	15.750	1.000	1.500	0.610	–0.154	39000.000	179.088	2.288	314.600	0.045
	N	233.000	233.000	171.000	233.000	233.000	233.000	233.000	233.000	233.000	233.000	233.000	233.000	233.000
2012	Mean	0.019	0.062	–0.091	3.222	0.101	0.668	0.302	–0.032	2319.495	70.033	1.108	20.523	0.009
	Std. Deviation	0.094	0.169	0.109	2.937	0.301	0.238	0.118	0.010	4669.424	57.932	0.597	37.038	0.007
	Minimum	–0.709	–0.649	–0.278	0.083	0.000	0.000	0.000	–0.196	7.300	0.133	–1.579	0.029	0.001
	Maximum	0.409	2.462	0.679	11.333	1.000	1.500	0.610	–0.031	33000.000	219.220	8.878	263.900	0.047
	N	298.000	298.000	175.000	298.000	298.000	298.000	298.000	298.000	298.000	298.000	298.000	298.000	298.000
2013	Mean	0.027	0.058	–0.091	3.505	0.104	0.618	0.283	0.031	1890.468	70.453	0.983	17.004	0.012
	Std. Deviation	0.154	0.156	0.109	3.023	0.306	0.277	0.133	0.000	4945.536	56.471	0.863	34.284	0.010
	Minimum	–0.503	–0.473	–0.278	0.083	0.000	0.000	0.000	0.031	3.000	0.167	–0.116	0.007	0.001
	Maximum	1.248	1.279	0.679	12.333	1.000	1.500	0.610	0.031	46000.000	228.226	13.478	250.100	0.096
	N	364.000	364.000	176.000	364.000	364.000	364.000	364.000	364.000	364.000	364.000	364.000	364.000	364.000
2014	Mean	0.189	0.228	–0.091	3.736	0.094	0.610	0.300	–0.070	1826.461	98.851	1.314	14.510	0.012
	Std. Deviation	0.184	0.185	0.110	3.138	0.291	0.282	0.162	0.000	3862.627	85.875	2.607	25.972	0.012

	Minimum	–0.475	–0.389	–0.278	0.083	0.000	0.000	0.000	–0.070	0.542	0.235	–1.101	0.007	0.000
	Maximum	1.809	1.903	0.679	13.333	1.000	1.500	0.750	–0.070	31000.000	589.797	40.122	217.700	0.095
	N	449.000	449.000	174.000	449.000	449.000	449.000	449.000	449.000	449.000	449.000	449.000	449.000	449.000
2015	Mean	0.105	0.143	–0.091	3.232	0.069	0.596	0.331	0.420	1689.775	207.746	1.986	15.699	0.017
	Std. Deviation	0.138	0.195	0.111	3.236	0.254	0.275	0.179	0.033	3775.225	173.337	14.966	30.666	0.016
	Minimum	–0.275	–0.486	–0.278	0.083	0.000	0.000	0.000	0.146	5.700	0.265	–0.303	0.019	0.001
	Maximum	1.413	1.661	0.679	14.333	1.000	1.500	0.833	0.424	48000.000	673.930	383.684	283.500	0.183
	N	694.000	694.000	171.000	694.000	694.000	694.000	694.000	694.000	694.000	694.000	694.000	694.000	694.000
Total	Mean	0.057	0.097	–0.094	3.345	0.084	0.638	0.307	0.088	2158.105	114.708	1.439	22.111	0.012
	Std. Deviation	0.192	0.234	0.108	3.097	0.278	0.267	0.150	0.362	4440.382	125.315	8.303	41.656	0.012
	Minimum	–1.304	–1.644	–0.278	0.083	0.000	0.000	0.000	–1.061	0.542	0.133	–1.579	0.007	0.000
	Maximum	1.809	2.462	0.679	15.750	1.000	1.500	0.833	0.588	48000.000	673.930	383.684	366.900	0.183
	N	2327.000	2327.000	1057.000	2327.000	2327.000	2327.000	2327.000	2327.000	2327.000	2327.000	2327.000	2327.000	2327.000

Table 3: Moderated Hierarchical Regression Results (Dependent Variable: Lagged Alpha)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	VIF
Constant	–0.002	0.010	0.016	0.012	–0.011	0.022	0.019	0.006	0.005	–0.021	
	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)	(0.012)	(0.012)	(0.013)	(0.012)	(0.015)	
Control variable											
Age of Fund	–0.076***	–0.098***	–0.093***	–0.094***	–0.093***	–0.092***	–0.095***	–0.092***	–0.089***	–0.090***	1.312
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	
QDII	0.124**	0.192***	0.195***	0.195***	0.195***	0.192***	0.197***	0.200***	0.191***	0.196**	1.108
	(0.041)	(0.043)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	
Daily Purchase Fee	–0.081***	–0.057***	–0.049**	–0.050**	–0.047**	–0.049**	–0.048**	–0.048**	–0.053***	–0.052***	1.361
	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	
Daily Redemption Fee	–0.034**	–0.037**	–0.043**	–0.043**	–0.041**	–0.041**	–0.038**	–0.042**	–0.043***	–0.035**	1.071
	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	
Share Market Return	–0.145***	–0.166***	–0.179***	–0.180***	–0.182***	–0.180***	–0.179***	–0.180***	–0.184***	–0.187***	1.153
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	
Independent variables											
Fund Size		0.077***	–0.001	–0.001	0.001	0.001	–0.001	–0.001	–0.005	0.000	2.695
		(0.017)	(0.019)	(0.019)	(0.024)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	
Fund Family Size		–0.054***	–0.057***	–0.057***	–0.062***	–0.067***	–0.076***	–0.057***	–0.058***	–0.093***	1.531
		(0.016)	(0.016)	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.013)	(0.015)	
Net Cash Flow		0.065***	0.039**	0.040**	0.039**	0.038**	0.038**	0.053**	0.053***	0.063***	1.290
		(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	
Moderators											
Management Compensation			0.090***	0.090***	0.094***	0.086***	0.108***	0.091***	0.096***	0.117***	2.665
			(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	1.520
Expense Ratio			–0.053***	–0.054***	–0.054***	–0.060***	–0.049**	–0.056***	–0.057**	–0.066*	
			(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.014)	(0.015)	
Interaction Terms											
Fund Size × Expense Ratio (H1)				–0.013						–0.014	1.224
				(0.012)						(0.013)	
Fund Size × Management Compensation (H2)					0.033**					0.030**	1.300
					(0.011)					(0.011)	
Fund Family Size × Expense Ratio (H3)						0.027**				0.031**	1.165
						(0.013)				(0.013)	
Fund Family Size × Management Compensation (H4)							–0.055***			–0.060***	1.091
							(0.013)			(0.013)	
Net Cash Flow × Expense Ratio (H5)								–0.038**		–0.036**	1.370
								(0.014)		(0.014)	
Net Cash Flow × Management Compensation (H6)									0.067***	0.061***	1.141
									(0.015)	(0.015)	
Observations	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	
R–squared	0.080	0.105	0.118	0.119	0.122	0.120	0.125	0.121	0.125	0.140	
Adjusted R Square	0.078	0.101	0.114	0.114	0.118	0.116	0.121	0.117	0.121	0.134	
F Value	40.169***	33.800***	31.006***	28.306***	29.131***	28.627***	30.024***	28.969***	30.145***	23.571***	

Note: Standard errors in parentheses
* p < 0.10; ** p < .05; *** p < .01. (2–tailed).

Table 4: Moderated Hierarchical Regression Results (Dependent Variable: Lag NAV Return)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	VIF
Constant	–0.001	0.010	0.019	0.013	–0.025	0.025*	0.021	0.007	0.009	–0.036**	
	(0.013)	(0.013)	(0.013)	(0.014)	(0.016)	(0.013)	(0.013)	(0.014)	(0.013)	(0.016)	
Control variable											
Age of Fund	–0.061***	–0.083***	–0.075***	–0.077***	–0.076***	–0.074***	–0.077***	–0.074***	–0.072***	–0.073***	1.312
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	
QDII	0.134**	0.198***	0.200***	0.201***	0.201***	0.197***	0.202***	0.207***	0.197***	0.202***	1.108
	(0.045)	(0.046)	(0.046)	(0.046)	(0.045)	(0.046)	(0.046)	(0.046)	(0.046)	(0.045)	
Daily Purchase Fee	–0.076***	–0.053***	–0.052**	–0.054**	–0.050**	–0.052**	–0.052**	–0.052**	–0.057***	–0.054***	1.361
	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	
Daily Redemption Fee	–0.067**	–0.073***	–0.079***	–0.079***	–0.076**	–0.077***	–0.076***	–0.077***	–0.079***	–0.071***	1.071
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	
Share Market Return	–0.096***	–0.116***	–0.134***	–0.135***	–0.138***	–0.134***	–0.134***	–0.135***	–0.138***	–0.143***	1.153
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	
Independent variables											
Fund Size		0.080***	–0.003	–0.002	0.001	–0.001	–0.001	–0.003	–0.007	0.000	2.695
		(0.015)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	
Fund Family Size		–0.045**	–0.051***	–0.051***	–0.060***	–0.062***	–0.063***	–0.051***	–0.052***	–0.086***	1.531
		(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.014)	(0.014)	(0.016)	
Net Cash Flow		0.072***	0.041**	0.041**	0.040**	0.039**	0.040**	0.057**	0.054**	0.064***	1.290
		(0.016)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)	
Moderators											
Management Compensation			0.084***	0.085***	0.092***	0.080***	0.095***	0.085***	0.090***	0.107***	2.665
			(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.019)	(0.0120)	
Expense Ratio			–0.078***	–0.080***	–0.081***	–0.086***	–0.076***	–0.082***	–0.083***	–0.096***	1.520
			(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	
Interaction Terms											
Fund Size × Expense Ratio (H1)				–0.020						–0.014	1.224
				(0.013)						(0.014)	
Fund Size × Management Compensation (H2)					0.057***					0.054***	1.300
					(0.012)					(0.012)	
Fund Family Size × Expense Ratio (H3)						0.028**				0.035**	1.165
						(0.014)				(0.015)	
Fund Family Size × Management Compensation (H4)							–0.035**			–0.040**	1.091
							(0.014)			(0.014)	
Net Cash Flow × Expense Ratio (H5)								–0.045**		–0.040**	1.370
								(0.015)		(0.015)	
Net Cash Flow × Management Compensation (H6)									0.062***	0.054**	1.141
									(0.017)	(0.017)	
Observations	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	2,327	
R–squared	0.048	0.071	0.087	0.088	0.096	0.089	0.090	0.091	0.093	0.109	
Adjusted R Square	0.046	0.068	0.083	0.084	0.092	0.085	0.085	0.087	0.089	0.103	
F Value	23.235***	22.167***	22.132***	20.358***	22.433***	20.504***	20.726***	21.038***	21.517***	17.722***	

Note: Standard errors in parentheses. * p < 0.10; ** p < .05; *** p < .01. (2–tailed).

Table 5: Moderated Hierarchical Regression Results (Dependent Variable: Lag Fama and French Three Factor Excess Return)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	VIF
Constant	-0.098	-0.098	-0.095***	-0.096***	-0.091***	-0.096***	-0.095***	-0.097***	-0.095***	-0.094***	
	(0.005)	(0.006)	(0.006)	(0.006)	(0.015)	(0.012)	(0.006)	(0.006)	(0.006)	(0.006)	
Control variable											
Age of Fund	0.008	0.010	0.009	0.009	0.009	0.009	-0.009	0.010	0.010	0.010	1.247
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.07	(0.007)	(0.007)	(0.007)	
QDII	0.054***	0.053**	0.045**	0.043**	0.052**	0.046**	0.046**	0.046**	0.045**	0.057**	1.417
	(0.015)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)	(0.018)	
Daily Purchase Fee	0.013**	0.013**	0.018***	0.018***	0.017***	0.018***	0.018***	0.018***	0.018***	0.017***	1.435
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.0054)	
Daily Redemption Fee	0.017***	0.017***	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***	0.019**	1.155
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	
Share Market Return	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	1.050
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	
Independent variables											
Fund Size		-0.005	-0.004	-0.001	0.001	-0.005	-0.004	-0.005	-0.005	0.003	3.385
		(0.005)	(0.008)	(0.019)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	
Fund Family Size		-0.007	0.000	0.000	0.000	0.000	-0.001	0.000	0.000	-0.001	1.621
		(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	
Net Cash Flow		-0.011	-0.006	-0.006	-0.006	-0.006	-0.006	-0.007	-0.008	-0.006	1.181
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	
Moderators											
Management Compensation			0.005	0.005	0.006	0.005	0.005	0.005	0.004	0.007	2.944
			(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	
Expense Ratio			0.017**	0.020**	0.018**	0.017**	0.017**	0.017**	0.017**	0.022***	2.156
			(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	
Interaction Terms											
Fund Size × Expense Ratio (H1)				-0.007						-0.006	2.095
				(0.005)						(0.006)	
Fund Size × Management Compensation (H2)					-0.009*					-0.014**	2.300
					(0.005)					(0.006)	
Fund Family Size × Expense Ratio (H3)						-0.003					
						(0.006)				0.001	1.515
Fund Family Size × Management Compensation (H4)							0.001			0.005	
							(0.006)			(0.007)	1.560
Net Cash Flow × Expense Ratio (H5)								-0.015**		-0.014	
								(0.006)		(0.007)	1.122
Net Cash Flow × Management Compensation (H6)									0.008	0.003	
									(0.009)	(0.010)	1.273
Observations	880	880	880	880	880	880	880	880	880	880	
R-squared	0.046	0.054	0.068	0.070	0.071	0.068	0.068	0.074	0.069	0.080	
Adjusted R Square	0.041	0.046	0.057	0.058	0.059	0.056	0.056	0.062	0.057	0.063	
F Value	8.442***	6.250***	6.322***	5.968***	6.035***	5.778***	5.745***	6.268***	5.819***	4.725***	

Note: Standard errors in parentheses. * p < 0.10; ** p < .05; *** p < .01. (2–tailed).

Figure 2: Fund Size × Expense Ratio

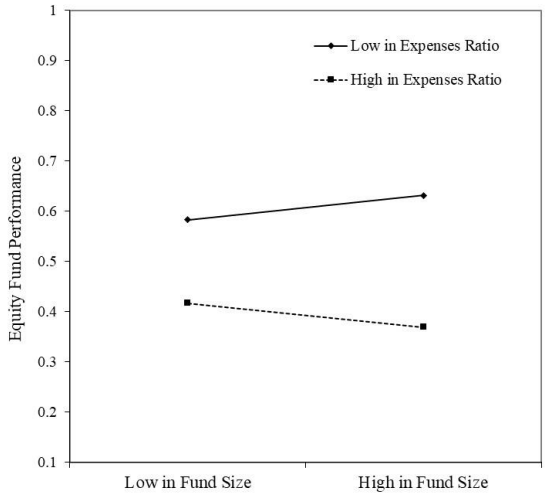

Figure 3: Fund Size × Management Compensation

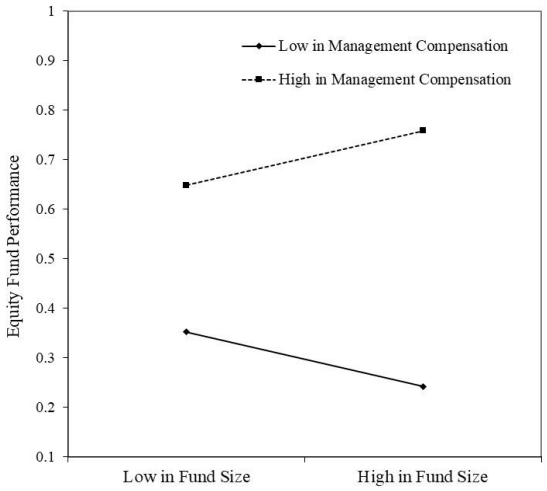

Figure 4: Fund Family Size × Expense Ratio

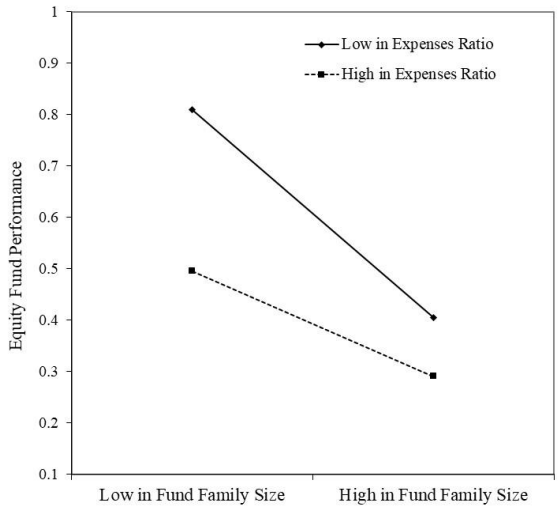

Figure 5: Fund Family Size × Expense Ratio

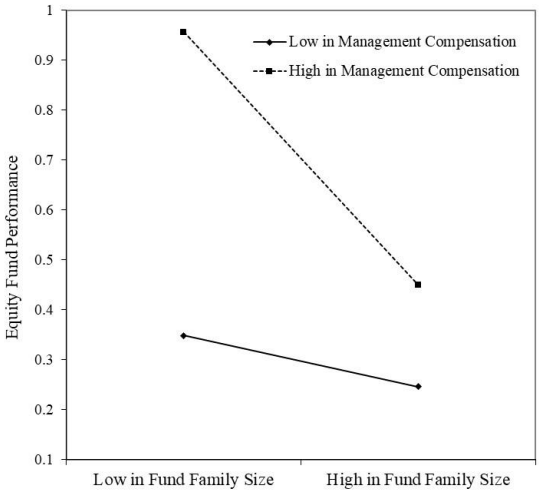

Figure 6: Fund Family Size × Management Compensation

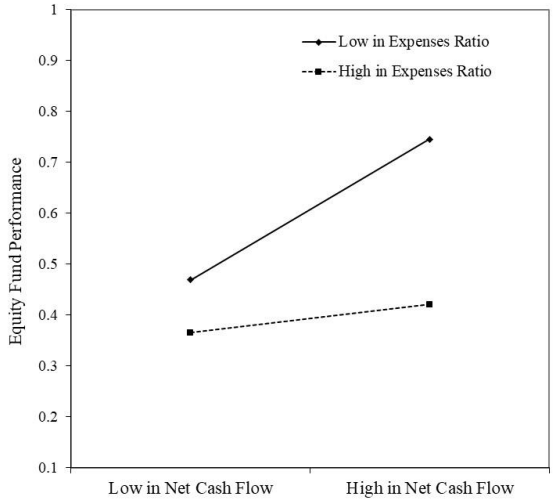

Figure 7: Net Cash Inflow × Management Compensation