Master Thesis

Equity Mutual Fund Performance:
Evidence from China

University of Twente

School of Management and Governance

Master of Science in Business Administration
Track: Financial Management

Name: *Qiqiang Shi (s1199447)*

Date: *March, 2013*

Supervisors: *Xiaohong Huang*
H.C. (Henry) van Beusichem

UNIVERSITEIT TWENTE.

Acknowledgements

I would like to thank my first supervisor, Xiaohong Huang, a responsible and brilliant person who has provided me with guidance and support in completing this thesis. Her vigorous academic ability enlightens me in this thesis as well as in my future study.

I am also cordially thankful for comments and suggestions from the second supervisor, H.C. (Henry) van Beusichem.

My classmates and friends supported me in my thesis. I want to thank them for all their help, support and suggestions during this period. A special thanks to one of my classmates, Lu Xu, for her help through data collection.

Finally, my gratitude extends to my beloved family for their continued support through difficult and challenging times during this period.

Qiqiang Shi

Enschede, the Netherlands

March, 2013

Abstract

This thesis provides evidence on the performance of open-end equity fund in a prominent emerging market from China perspective. This study examines the performance of 157 equity funds from 1st January 2006 to 31st December 2010 by using two measures of fund performance: market benchmark adjusted return and Jensen's Alpha. Our sample period includes bear (2008 and 2010) and bull (2006, 2007 and 2009) market conditions. In addition, this research further investigates the impact of fund characteristics and managerial attributes on the Chinese open-end equity fund performance, through applying the pooled cross-sectional analysis with OLS regression. The explanatory variables examined include fund size, fund age, expense ratio, turnover ratio, and management structure and managerial education.

We firstly analyze the performance of the Chinese open-end equity fund. The overall results suggest that on average equity funds are able to beat the markets, as indicated by their positive market benchmark adjusted return and Jensen's Alpha. Afterwards, the results indicate that fund age, turnover ratio and expense ratio have significant relationship with fund performance over the whole examination period. More specifically, an equity fund with short-established, high turnover ratio and low expense ratio performed better than the one with long-established, low turnover ratio and high expense ratio. Furthermore, we compare the two different market conditions, the findings also document that a fund with high turnover ratio performed better than one with low turnover ratio. Additionally, our results reveal that investors can implement an investment strategy that buy a long-establish fund with team-manager under bear market period, and then sell it under bull market period will generate high profit.

Table of Contents

LIST OF FIGURES AND TABLES

1 Introduction

1.1 Background

As financial markets grow dramatically, more and more investment vehicles come out, such as mutual funds and hedge funds. Both individual and institutional investors widely apply professional money managers to supervise asset effectively and efficiently. Nowadays, tremendous amounts of money are plowed into mutual funds in mature markets as well as in emerging markets; due to provide diversification profit opportunities.

The mutual fund is an investment vehicle, which is a large of capital composited from many investors. The purpose of mutual funds is to provide benefit, like diversification, low costs and professional management, through investing in equity, bond, money market instruments and similar assets. Based on the investment style, the mutual fund can be categorized differently, such as an aggressive growth-, growth-, growth and income-fund. An aggressive growth fund attempts to reach the highest capital gains but no income from dividends. Then, a growth fund is mainly above-average growth in earnings. The commonly acceptable and ever-popular fund its growth and income, which is moderate with risk, and also have income generating from dividends or interest payments.

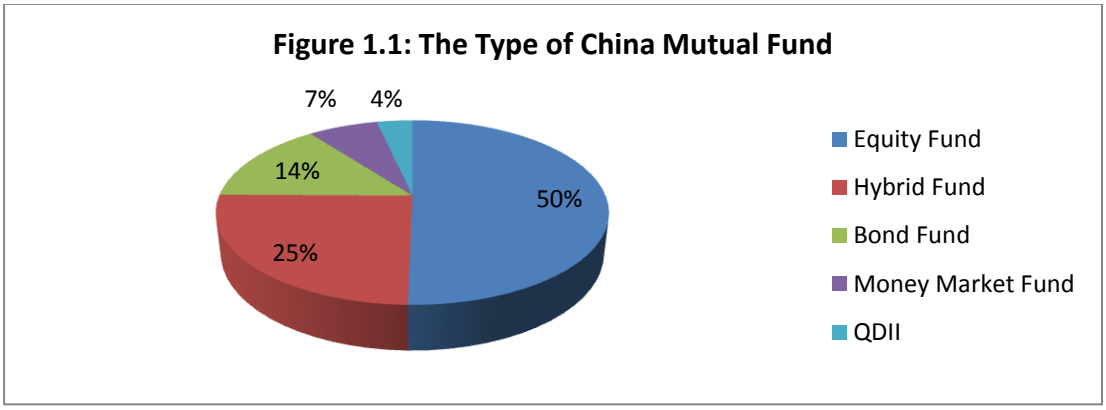
The finding from Lhabitant & Learned (2002) indicated that the mutual fund has an ability to invest in more portfolios and then reduce the portfolio's volatility. Therefore, mutual funds that a pool assets from investors, may gain more benefit from plowing into diversified portfolios compared with a single investor. This is one of the main reasons that a mutual fund would attract more investors, and grow dramatically.

From a mature market perspective, such as the U.S., the data were collected by the Investment Company Institute (2011). They indicated that mutual fund is playing an essential role in investing in alternative for the US's individual and institutional investors. The assets of all the U.S. mutual fund were more than $11.8 trillion, and even approximately ninety million investors possessed mutual funds. Indeed, the mutual fund has played a more important investment vehicle compared with others, the survey showed that sixty-four percentages investors hold more than half of their financial assets as the mutual fund.

Turning to emerging markets, such as China, Indonesia, Malaysia, the mutual fund has been growing dramatically. Huij & Post (2011) documented that the equity mutual fund in emerging market had performed better than in developed market. For instance, Carhart (1997) demonstrated that the top- and bottom-decile of US fund had 2.64% and -5.4%, respectively. Huij & Post (2011) documented that these rates are relatively double in emerging markets compared with the US fund, indicating 4.29% and -2.8%, separately. As China's Mutual fund introduced in March, 1998, the securities investment funds grow significantly. Until the end of 2007, in the China's mutual funds market the total net asset of different types of asset categories reached 3.3 trillion Yuan. Meanwhile, one survey was conducted by Galaxy Securities, France-Presse (2008). Their result indicated that 12,284 (83%) out of 14,800 answerers preferred mutual fund as a first investment vehicle for financial asset management. Moreover, the total asset value of securities investment funds was more than RMB 2.52 trillion at the end of 2010, which was decrease compared with 2007. But the total asset value of securities investment funds was more than 10% of A Shares Market[1].

In China mutual fund market, most mutual funds are equity funds, like the U.S., From the end of 2010, equity funds had half (330) of total mutual fund, while the number of bond funds, money market funds, hybrid funds and qualified domestic institutional investors (QDII)[2] had 163, 95, 45, and 23, respectively. See figure 1.1[3] demonstrates the detailed proportion of the different mutual fund types at the end of 2010. This figure is collected from the China Securities Regulatory Commission (CSRC) website. Equity fund has already become one of the most important investment vehicles for investors. Therefore, it is meaningful to study on the investment preference of the Chinese equity fund. In this thesis, I mainly concentrate on the equity mutual fund.

[1] A Shares Market: are priced in the local Ren Min Bi Yuan currency, and restricted to domestic investors as well as the Qualified Foreign Institutional Investor (QFII).
[2] QDII: allows investors to invest in foreign securities markets.
[3] From: http://fund.csrc.gov.cn/web/gotView.statFund?year=2010&season=FB010010



Data source: China Securities Regulatory Commission (CSRC)

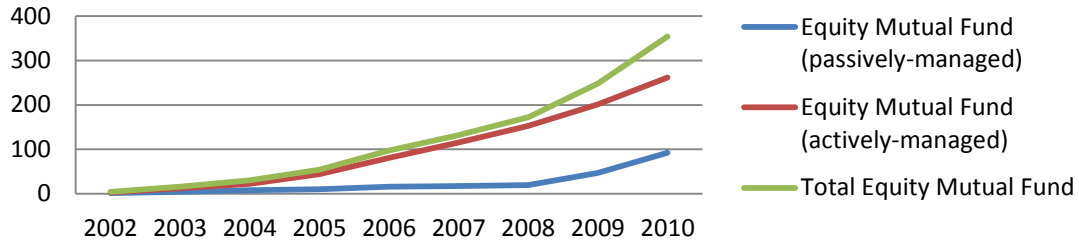
The mutual fund can also be categorized, besides the classification above section mentioned, as open-end or closed-end mutual fund. Commonly, the majority of mutual funds are open-end fund, which is defined that it issues or buys back shares continuously when investors wish to. For closed-end funds, it is a publicly traded investment firm with a fixed number of shares at the point of initial public offering time. In China, the closed-end mutual funds clearly define the duration which is more than 5 years, issued fund cannot be redeemed within this period. Moreover, the amount of both mutual funds had boosted to 1019 funds in which 94.6% were open-end mutual funds in the Chinese equity mutual funds at the end of 2011. Meanwhile, the percentage rate of open-end equity funds was 93.5% in total equity funds. Furthermore, the majority of equity funds invest in domestic or few foreign companies listed in Chinese stock markets.

Managerial style in China, see figure 1.2[4] below, the majority of equity mutual funds was actively-managed. The fund managers attempt to outperform the market benchmark by picking and choosing investment strategies. Index fund as passively-managed, on the other hand, that manager wants to copy the performance of a specified index. The evidence from a recent period in China market by Wang (2012), passively-managed funds had better performance than actively-managed funds during bull market periods (2006, 2007 and 2009), while actively-managed fund showed an advantage for risk averse due to diversification. She also revealed that actively-

[4] This figure is collected from HeXun database website, see http://funds.hexun.com/

managed as a better choice for long-term investment. Furthermore, from the figure 1.2, we can clearly see that the passively-managed fund increased after 2008, even dramatically boosted since 2009. Because investors have concerns that the index funds as bringing better performance compared with actively-managed funds in recent years. Even so, the actively-managed funds still occupied a large portion. Therefore, based on above, we will choose the open-end equity funds which exclude the index fund as our research sample in this thesis due to the managerial style difference.

Figure 1.2: The amount of passively- and actively-managed open-end equity mutual fund between 2002-2010 in China market



Data source: *Hexun database website*

1.2 Problem discussion

As mutual fund growth enormously, how to improve mutual funds' performance or strength the persistence of mutual fund's performance have become critical issues. Based on a large number of academic investigated, Peterson et al. (2001) indicated that discussion of mutual fund performance can be classified three category perspectives. The first category is the persistence of mutual fund performance. Secondly, this area is documented the fund managers' ability and skills whether can improve mutual fund performance. The last category analyzes the fund's characteristics whether can predict, and describe mutual fund performance.

In the last two decades, most authors found evidences from developed markets that past mutual fund performance can forecast the future fund return in the short-term, such as Goetzmann & Ibbotson (1994), Elton, Gruber, & Blake (1996), and Benos & Jochec (2011) or long-term horizons, e.g. Grinblatt (1992), and Brown & Goetzmann (1995). Indeed, their findings indicated that the persistence of mutual fund largely appeared in the worse-performance, but still can see in the best-performing. This

means an investor can buy a fund with the best-performed in the past instead of the worst-performed that will generate the abnormal return in the future. Notably, the winning chase strategies contributed to the persistence of fund performance. However, Carhart (1997) revealed that the fund performance cannot exist for long-term period. As studies in persistence in emerging markets, He & Hao (2008), Lai & Lau (2010) showed that the best-performed mutual fund appears persistence as well as worst-performed fund in short-term horizon.

Turning to the managerial skill or ability, the evidence from Du, Huang, & Blanchfield (2009), Berk & Green (2004), and Baks, Metrick, & Wachter (2001) indicated that skilled or experienced managers cannot get outperformance. Indeed, Prather, Bertin, & Henker (2004) documented that fund performance became worse due to manager transferring their efforts to different funds, when fund manager had more experienced or mastered in the U.S. mutual fund industry. In emerging market aspects, there are holding similar opinion compared with developed market. Evidence from China mutual fund industry, Zeng, Zha, & Gong (2006) revealed that the manager tenure was negatively significant related to fund performance.

For fund-specific characteristic, examining the expense ratio was common explanatory variable, which was studied in the majority of literatures. The results held almost the same in developed markets e.g. sees Otten & Bams (2002), Carhart (1997), Haslem, Baker, & Smith (2008), Prather, Bertin, & Henker (2004) or in emerging markets e.g. sees Gottesman & Morey (2007), Babalos, Kostakis, & Philippas (2009). Their finding indicated that mutual fund with low expense ratio had outperformance compared to one with a high expense ratio. Furthermore, other fund-specific factors, which were commonly tested in previous literatures, included turnover, age, and size explanatory variables. The turnover ratio was a controversy factor in both developed and emerging markets. Carhart (1997) found that the turnover was negatively related to mutual fund performance in the U.S. market, while Tang, Wang, & Xu (2012) indicated the turnover ratio was positively related to fund performance in China markets.

From above, the difference and similar findings between developed- and emerging-markets are presented. There are a series of conjectures for explaining those

differences in emerging markets compared with developed markets. Firstly, majorities of investors are lower finance education background or inexperienced in emerging markets compared with developed markets. Thereafter, the individual investors may really concentrate on the fund manager' speech instead of investigation by themselves. However, the professional qualities of fund manager have irregularity in emerging markets. Some fund managers are likely to low integrity, prudence and diligence, even manipulate or mislead the market trading in order to get higher compensation. Secondly, fund's investment is less liquid and efficient assets that are difficult to trade in emerging markets compared with developed market. Last but not least, the Chinese mutual fund industry exist oligopolistic company due to the small size of the mutual fund market. Therefore, the informational asymmetry will provide more opportunities for some fund manager to find the abnormal return. More specifically, manager of a mutual fund has an information advantage or has a sophisticated ability can achieve excess returns. Hence, fund managers have more opportunities to find abnormal returns due to a less efficient market compared with developed market, and then are able to beat the market. In this thesis, we explore the impact of fund-specific characteristics and managerial attributes influencing on the open-end equity mutual fund performance with actively-managed in order to get new insight and understanding the Chinese equity mutual fund.

1.3 Problem definition and purpose

Despite there are several literatures discussed the mutual funds' performance in emerging markets, but it is still a remarkable lack of understanding and information about the mutual fund industry, especially mutual funds in China, amongst fund specific characteristics and fund performance relationship. Some previous paper typically applied several fund-specific characteristics to predict mutual fund performance, like the expense ratio, age, size, and turnover ratio e.g. see Białkowski & Otten (2011), and Babalos, Kostakis, & Philippas (2009). For managerial attribution, the investigation of managerial variables in emerging market did show limited. Zeng, Zha, & Gong (2006) applied Jensen's Alpha determined abnormal return to see the impact of managerial attribute in Chinese markets. This evidence cannot hold strong robustness due to applied single performance measurement. Based on the above, this thesis explored not only more than one different measures to

determine the mutual fund performance, but also to investigate extra managerial factors such as managerial education and structure to examine the impact on fund performance.

The purpose of this thesis is trying to find the most relative predictive factors in which are reliable signed and reliable significant influencing on the China's open-end equity mutual fund performance during the beginning of 2006 to the end of 2010. In order to fully explanatory and understanding, we examine the relationship under the overall sample period as well as the different market conditions (bull and bear markets) to see whether the results are consistent. Based on this, we would like to see, initially, how China equity mutual fund performance is. After that, we examine the fund-specific variables and managerial attributes influencing on fund performance. Therefore, the two main research questions can be formulated following:

- In terms of investment returns, how have open-end equity fund with actively-managed in China performed?
- How do fund-specific characteristics and managerial attributes influence the performance (return) of China's equity mutual fund?

Before we analyze the equity fund performance, the fund return should be defined. Mutual fund investors, usually, receive two kinds of return: dividends and capital gains. We used Net Asset Values (NAVs) of equity funds as raw return. The monthly raw returns of the funds are inclusive of dividends which are paid out by common shares. Fund raw return is calculated net of fees. The market return is formed by the weight three major indexes in Chinese markets (40% Shanghai Composite Index + 20% Shanghai Government Bond + 40% Shenzhen Component Index). And then risk-free rate is proxied by the one-year fixed bank deposit rate.

In order to determinate the open-end equity funds' performance, research literatures reveal various standpoints with respect to the use of risk-adjusted returns. Until now, there are six benchmarks to measure fund performance: Average Abnormal Return, Sharpe Ratio, Treynor Ratio, Jensen's Alpha, Fama-French 3-factor Alpha and Carhart's 4-factor Alpha. The most common performance measure is the average abnormal return, which measures the return in excess of market benchmark or risk-

free rate. For above mentioned two ratios, the greater a mutual fund's Sharpe or Treynor ratio, the better its risk-adjusted performance has been. In addition, Alpha is highly concerned method by recent researchers for measuring mutual fund performance, such as the Jensen's Alpha, Fama-French's 3-factor Alpha and Carhart's 4-factor Alpha, which are based on the Capital Asset Pricing Model (CAPM). Alpha can be calculated based on different duration, like 1-, 3-, 5-year and even more periods. Based on the above, the positive value of Alpha can imply that the fund has outperformance. The more detail of those definitions and equation, see appendix A

The present study examines the open-end equity fund which excludes the index fund in China market by applying the two models: market adjusted model and Jensen's Alpha. The combined dataset amounts to a total of 456 annual observations for 157 open-end equity funds. The duration of our sample includes bull- (2006, 2007, and 2009) and bear-(2008, and 2010) markets, which was claimed by Cao, Huang, & Zhang (2011). The determinant of market periods is based on the stock market performance. The results of this paper will extend the existed literatures by adding more value of fund-specific factors and managerial attributes influencing on mutual fund performance. Those findings also can support investors to understand and then diversify their capital investment in the China mutual fund industry.

1.4 Thesis structure

The remaining part of this thesis is organized as follows. Section 2 shows recent decade studies on mutual fund performance in developed markets as well as in emerging markets. In this section, we can know general information about mutual fund performance from persistence, fund manager skill or ability, and fund-specific characteristic. And then the hypotheses are built at the end of this section. Section 3 and 4, the methodology and data collection is discussed. Further, section 5 is analyzing the results of an empirical study, where section 5.1 presents fund performance based on the two different measurement models. Then, section 5.2 runs the regression equation to analyze the relationship and answer the hypotheses. The robustness tests are discussed in section 6. The conclusion of this thesis is allocated in Section 7. The last part is coming up with the limitation of this study and suggestion for further research.

2 Literature review and hypotheses

2.1 Literature review

Nowadays, a majority of investigation have concentrated on mutual fund returns rather than on stock returns under the modern asset pricing framework. A large number of academic research have been studied the mutual fund performance in the developed markets during the last two decades, like the US funds, while for emerging market several studies existed in recent years. But it still has some limitations compared with developed markets. In this section, the literatures of developed and emerging markets will be reviewed. After that, comparing two different markets will be summarized, and then coming up part is testable hypotheses.

2.1.1 Evidence from developed markets

2.1.1.1 Mutual fund performance

From the developed market perspective, a large amount of studies of mutual fund have come out since 1990's in the United States. Several most relatively studies are gathered, which were concentrated on the U.S. market. For instance, Elton, Gruber, & Blake (1996) applied risk–adjusted return, which is based on the Alpha from a four-index CAPM model, to determine the common stock fund performance between 1977 and 1993. And they applied similar measurement horizons period 1- and 3-year with previous studies e.g. Goetzmann & Ibbotson (1994), Brown & Goetzmann (1995). The average return of mutual funds had negatively performed during this period. After that, used ranking of different Alpha (1-year selection Alpha, and 3-year selection Alpha) examined the relationship between past performance and future performance (1-and 3-period). Their result showed that the past performance can provide information about future performance based on the 1- and 3- year period future fund performance evaluation. Further, samples of total return were higher related under Alpha with 1-year period compared with 3-year period.

Another more recent related study, Huij & Verbeek (2007) investigated more than 6400 U.S. equity mutual funds during the period 1984-2003. Then, they applied both

ordinary least square (OLS) regression and Bayesian analysis[5] to calculate the Carhart (1997) Alphas. Their result obviously indicated that former equity mutual funds' performance can forecast the future fund performance in 1- and 3-year period, when funds were ranked the Carhart's Alpha that were calculated based on Bayes approach. Meanwhile, the best-perform fund showed higher abnormal return under 1-year period compared under the 3-year period. When funds were ranked on the Carhart's Alpha based on standard OLS, the result indicated that the short-run persistence existed but significantly lower than that of Bayes approach. Based above, those two studies showed the same result that past fund performance can predict future performance, especially within the one-year period.

2.1.1.2 Managerial skill and ability

In addition, investigation in fund manager, Golec (1996) documented that the younger managers (less than 46 years old) with longer tenure (more than 7 years) who held MBA degrees had better risk-adjusted return during 1988 to 1990 in the U.S. market. Furthermore, Gottesman & Morey (2006) examined the relationship between fund manager education and mutual fund performance in the U.S. fund industry during the 2000 to 2003 period. The manager education was measured by the mean of the GMAT score and the ranking of MBA programs. The results showed that the fund manager with a diploma from top 30 MBA programs which were ranked by Business Week got better performance compared with fund manager without MBA degree or not graduation from top 30 MBA programs.

Karagiannidis (2010) examined the relationship between management structure (single- or multiple-manager) and open-end mutual fund performance (growth-and income-oriented funds) in the U.S. during 1997-2004. He used ordinary least squares regression to see the Bull- (1997-2000) and Bear- (2001-2004) market periods. The results indicated that the growth-fund with managed by team-manager had lower mutual fund performance than by single-manager using the risk adjusted returns (Carhart's Alpha) as fund performance during the bear market period. Moreover, they

[5] Bayesian analysis: is an approach to estimate parameters of an underlying distribution based on the observed distribution.

indicated more specifically for team-manager in which separated mixed-team funds (multiple managers and multiple advisors) and pure-team funds (multiple managers but only one investment advisor). Their result indicated that the mixed - team brought the underperformance in bear market for growth-, income-oriented fund when the Carhart's Alpha was adapted as a measure of fund performance.

2.1.1.3 Fund-specific characteristics

With respect to the fund-specific characteristics, some concept of explanatory variables will be introduced in order to easily understand, see appendix B. Droms & Walker (1996) first major researched on the impact of fund characteristics influencing on risk-adjusted performance of equity fund using a pooled cross-section and time series analysis during 1971 to 1990. Their sample size was formed 151 the U.S. equity mutual funds with the impact of minimized survivor bias. Their results revealed that the equity mutual fund performance was not related to fund size, turnover ratio, and load fee. Notably, the fund's expense ratio was positively significant related to risk-adjusted performance.

Otten & Bams (2002) investigated the European mutual fund performance in the five most important mutual fund countries (France, Germany, Italy, Netherlands, and UK) during 1992-1998. Initially, they applied the Carhart's 4-factor model and the Jensen's Alpha to measure the mutual fund performance. Afterwards, the outcomes showed that fund size in all four countries was positively significant with risk adjustment fund performance (Carhart 4-factor Alpha), while the expense ratio and age were negatively related to performance in Germany and UK.

In addition, Haslem, Baker, & Smith (2008) examined the impact of characteristics of 1,779 actively-managed retail equity mutual funds on performance from January 2004 to December 2006 in the U.S.. They applied Sharpe ratios, Jensen's alphas, Morningstar ratings[6], annualized return, Cumulative returns and Russell Index-

[6] Morningstar Ratings: measures the amount of variation in a mutual fund's monthly performance. It has 5 categories, which represent 5 stars (top 10%), 4 stars (the next 22.5%), 3 stars (the next 35%), 2 stars (the next 22.5%), 1 star (the bottom 10%).

adjusted returns [7] as performance measurement for mutual funds. Their results documented that expense ratio and turnover ratio were negatively significant related with Sharpe ratio, and Jensen's Alpha. Further, fund size was positively significant related to all measurements of fund performance.

2.1.2 Evidence from emerging markets

2.1.2.1 Mutual fund performance

From the emerging market perspective, He & Hao (2008) examined the persistence of open-end mutual funds in China from 2004 to 2006, and applied Bernoulli trial scan statistics [8] to investigate the persistence of mutual fund performance. They introduced a value as a performance benchmark to decide the fund "success" (win) or "failure" (lose). The outcome showed that the best-performed and worst-performed equity-, money market-, and hybrid-fund existed a persistence during this sample period. Further, Cao, Huang, & Zhang (2011) applied the quarterly data of the overall 250 China open-end fund during the period of 2004-2010. And then they adjusted the raw returns with a market benchmark adjusted model and one-factor CAPM model (Jensen's Alpha). Based on their results, the overall sample funds underperformed under one-factor CAPM models during this period, while those funds outperformed under the market benchmark adjusted model. In addition, they divided their sample period into two different periods (bear and bull) to exam the fund persistence. Their finding documented that the persistence of fund performance differed under different market periods. More specifically, the persistence of fund performances showed weaker in the bull market compared within the bear market. Hence, investors in bull or bear market can purchase the fund with best performance instead of the worst performance.

In addition, Białkowski & Otten (2011) discussed the fund persistence in Poland. They investigated the persistence of 140 mutual fund performance on bond and mixed mutual funds from January 2000 to January 2008. They applied the Carhart 4-factor

[7] Russell Indexes-adjusted return: as benchmarks to measure mutual fund performance.
[8] Bernoulli trial scan statistics: to determine whether an observed cluster of events happened by chance, "success" and "failure".

model to test performance in the Polish mutual fund industry over a period of time. The outcomes of this investigation showed that the performance of Polish mutual funds was under their relative benchmark value, and also domestic funds had better performance compared with international funds. Their results, lastly, indicated that applied the strategy which purchased last year's best-performed fund and sold last year's worst-performed fund, can generate to better performance.

2.1.2.2 Managerial skills and ability

Zeng, Zha, & Gong (2006) used closed-end fund as sample between 2001-2004 in China market via applying Ordinal Least Squares regression to examine the managerial attributes influencing on fund performance. And then applied Jensen's Alpha measures abnormal return. Their results documented that fund manager tenure was negatively significant related to fund performance.

In addition, Liu (2009) studied both the 147 open-end and 30 closed-end mutual funds during the 2001-2008 period in China mutual fund industry, and then applied Logistic regression model[9] to predict managerial attribution on influencing mutual fund performance. His outcome revealed that single- and team-manager was no significant related to fund performance. Meanwhile, a fund manager with both science and engineering and economics background can generate better fund performance.

2.1.2.3 Fund-specific characteristics

Białkowski & Otten (2011) addressed the fund size issue; their result revealed that the size of assets under management is positively significant related to mutual fund performance. More detail study of fund size in emerging markets, for example, Tang, Wang, & Xu (2012) examined that the relationship between mutual fund performance and fund size from January 2004 to June 2010 in the Chinese mutual fund market. They used 136 open-end equity mutual funds and the Fama and MacBeth regression[10]. And then their results showed that the relationship between size and performance of

[9] Logistic regression: it is a type of regression analysis, which used for measuring the relationship between a categorical dependent variable and one or more continuous independent variable.
[10] The Fama-Macbeth regression: a way used to estimate parameters for asset pricing models. Indeed, it estimates the betas and risk premia for any risk factors, and then determines asset prices.

mutual funds was an inverted U-shape curve. When fund's size goes up, more specifically, the impact of the economy of scale can bring the better fund performance. Further, when the fund's size is too large, the impact of liquidity constraint can cause the worse fund performance. The scale of economy and liquidity constraint factors can determine the fund size how to influence on the fund performance. Therefore, the inverted U-shape can be explained by the economy of scale and liquidity constraint.

Another frequently discussed fund characteristic is the relationship and impact of the expense ratio on mutual fund performance. To disclose the relationship, Babalos, Kostakis, & Philippas (2009) extended research for investigating the relation between expense ratio and open-end equity fund performance from 2000 to 2006 in the Greek mutual fund industry. As used Jensen's alpha and Carhart 4-factor alpha method, they found that the expense ratio was negatively significant related to both risk-adjusted fund performance, which means, a high expense ratio played a vital role to bring about low equity fund performance. Meanwhile, they also documented the impact of fund age and size on mutual fund performance. The results showed that the fund age was positively significant related to fund performance, while the fund size was negatively significant related.

2.2 Comparing developed and emerging mutual fund markets

For fund performance, in both two markets, Brown & Goetzmann (1995), Goetzmann & Ibbotson (1994), Huij & Verbeek (2007), He & Hao (2008) and Huij & Post (2011) found that past mutual fund performance can predict the future return during a short-term period. This phenomenon is contributed by the common investment strategies, such as buying past-winning and selling past-losing stocks. In addition, Grinblatt & Titman (1992), and Elton, Gruber, & Blake (1996) documented that the persistence of mutual fund performance can show in long-term period. However, the contrast evidence is claimed by Carhart (1997), demonstrated that the persistence cannot exist in long-term horizons, only appear during 1-2 years.

Turning to managerial skills, from both economic markets, they held similar findings for skilled- or unskilled-manager that there were no differences impact on fund performance, claimed by Baks, Metrick, & Wachter (2001), Berk & Green

(2004), and Du, Huang, & Blanchfield (2009), even worse performance in both markets e.g. see Bertin, & Henker (2004), and Zeng, Zha, & Gong (2006). This is due to hold many assets, and helms several funds at the same time. Specifically, when a fund manager helms several funds in the meantime, their energy and ability will be separated into different funds so as to handle those funds difficultly and unequally, and thus erode fund performance. In addition, for managerial structure, several authors revealed that there was no obvious distinction on mutual fund performance when compared the performance of single- to team-manager in both markets, presented by Prather & Middleton (2006), Liu (2009), Karagiannidis (2010), and Bryant & Liu (2011). A manager with the financial and economic background can perform better in China, claimed by Liu (2009). However, Gottesman & Morey (2006) documented that only fund manager with MBA degree who can bring better fund performance, graduated from top 30 MBA programs in the U.S. market. The possible reason of this difference is because of the gap between manager's education and regulation. Compared with emerging markets, fund manager had higher education as well as fund industry had well-regulated in developed markets. Therefore, only a small percentage of manager who had the best knowledge or educational background can achieve better performance.

As taken fund characteristics into consideration, there are several popular factors that are usually tested by previous economists. As follows, Table 2.1 summarizes the implications and empirical evidences from matured and emerging markets on the relationship between each of the above determinants. One fund characteristic, expense ratio, is documented by several economists. The relationship between expense ratio and mutual fund performance had reliable singed. The interesting thing is that the impact of the expense ratio on mutual fund performance showed the similar opinion in both economic markets. For expense ratio, the majority of authors documented, such as Carhart (1997), Prather, Bertin, & Henker (2004) and Babalos, Kostakis, & Philippas (2009), that the expense ratio was negatively related to fund performance.

For turnover ratio, the results can be a variance in different economies. Carhart (1997), Edelen , Evans , & Kadlec (2007), Haslem , Baker , & Smith (2008) documented that turnover ratio was negatively related to performance in developed

markets, while Tang, Wang, & Xu (2012) held the opposite opinion that was positively related in China emerging market. From those contrast findings, it implies that China mutual fund industry may exist asymmetric information that can generate better performance, and then cover transaction and tax costs. Further, Benos & Jochec (2011), Otten & Bams (2002), Haslem and Baker , & Smith (2008) revealed that fund size was positive significantly related to fund performance in both markets.

In addition to the fund age explanatory variable, Babalos, Kostakis, & Philippas (2009) claimed that fund age was positively significant related to mutual fund performance in emerging markets, but Otten & Bams (2002) documented that it was negatively in developed markets. This impact of fund age on mutual fund performance contributes to companies experience, life cycle and managers' skills. In emerging markets, an elder mutual fund company seems to be more valuable compared with young companies. However, the mutual fund industry has existed a long period in developed markets. The fund performance decreases as age progress, and attribute this to the increasing complexity of the fund operation or size.

Table 2.1 Summary of the pervious empirical findings

Summary of the empirical evidences on fund-specific characteristics and managerial attributes influence on mutual fund performance from both matured and emerging markets. The signs are based on literature reviews. It can clearly show the similarities and different findings from both markets. The sample and examined period also includes.

Determinants	Sign	Empirical evidence from matured markets	Examined period	Sample	Empirical evidence from emerging markets	Examined period	Sample
Fund age	+				(Babalos, Kostakis, & Philippas, 2009)	2000-2006	75 Greek funds
	-	(Otten & Bams, 2002)	1992-1998	507 E.U. funds			
Fund size	+	(Otten & Bams, 2002)	1992-1998	507 E.U. funds	(Białkowski & Otten, 2011)	2000-2008	140 Poland funds
		(Haslem , Baker , & Smith , 2008)	2004-2006	1779 U.S. funds	(Lai & Lau, 2010)	1990-2005	331 Malaysia funds
	-	(Chen J. , Hong, Huang, & Kubik, 2004)	1962-1999	741 U.S. funds	(Babalos, Kostakis, & Philippas, 2009)	2000-2006	75 Greek funds
		(Bhojraj, Cho, & Yehuda, 2010)	1992-2008	U.S. funds			
Expense ratio	+	Droms & Walker (1996)	1971-1990	151 U.S. funds			
	-	(Carhart, 1997)	1962-1993	1892 U.S. funds	(Babalos, Kostakis, & Philippas, 2009)	2000-2006	75 Greek funds
		(Otten & Bams, 2002)	1992-1998	507 E.U. funds			
		(Prather, Bertin, & Henker, 2004)	1996-2000	over 5000 distinct funds			
		(Haslem, Baker, & Smith, 2008)	2004-2006	1779 U.S. funds			
Turnover ratio	+	(Kacperczyk, Sialm, & Zheng, 2005)	1984-1999	1771 U.S. funds	(Tang, Wang, & Xu, 2012)	2004-2010	136 China funds
	-	(Carhart, 1997)	1962-1993	1892 U.S. funds			
		(Edelen , Evans , & Kadlec, 2007)	1995-2005	1706 U.S. funds			
		(Haslem , Baker , & Smith , 2008)	2004-2006	1779 U.S. funds			
Fund manager education	+	(Golec, 1996)	1988-1990	530 U.S. funds	(Liu, 2009)	2001-2008	147 China funds
		(Gottesman & Morey, 2006)	2000-2003	518 U.S. funds			
	-						
Fund managerial structure (team or single)	+	(Han, Noe, & Rebello, 2008)	1993-2002	2171 U.S. funds			
	-	(Karagiannidis, 2010)	1997-2004	2031 U.S. funds			

2.3 Hypotheses development

It has been documented that some different fund characteristic variables can significantly influence the fund performance. Following, the most common variables, which have an influence on mutual fund performance, have been studied. These include fund size, fund age, expense ratio, turnover ratio, management structure, and managerial education. And with each examination of variable, a hypothesis has been made regarding to each variable for the ease of further analysis. Before introducing the fund characteristic variables, the open-end equity fund performance should be determined.

Equity fund performance

Jin & Wu (2007), and Tang, Wang, & Xu (2012) documented that the average Jensen's alphas in CAPM model and the market benchmark-adjusted return are indicated positive in Chinese market from 2004 to 2006 and 2004 to the first half of 2010, respectively. Indeed, Lai (2010) indicated that the average of Jensen's Alpha, Fama-French's Alpha and Carhart's Alpha were positive during the 2002-2009 period in Chinese mutual fund industry. This indicated that the majority of equity fund had outperformance in China. Therefore, we predict the equity mutual fund performance in the Chinese market as follows:

Hypothesis 1: on average, Chinese open-end equity funds have outperformance

Bull- and Bear- market period

The vast majority of fund performance studies on equity mutual funds have not concentrated on their behavior under different market periods. One of studies in China, Jin & Wu (2007) documented that open-end equity mutual fund on average are able to beat to the market under two market conditions, as indicated by their positive return after risk-adjusted. Therefore, we predict following hypothesis:

Hypothesis 2: on average, the performance of Chinese open-end equity mutual funds is outperformance under bear- as well as under bull-market period after risk adjusted.

Fund size

As a big size of the mutual fund, it can keep finding investment opportunities. Indeed, there are several advantages in a large size of mutual funds compared with

small one from theoretical aspects. On the one hand, funds can collect more opportunities to get the abnormal return, because a fund has large asset can invest more stocks or bond to diversify their unsystematic risk. On the other hand, economy of scale can explain that the larger the fund size leads to the better the fund performance. For instance, the large size fund has less brokerage commissions and marketing research costs than a small fund size. From empirical study, (Białkowski & Otten, 2011), (Lai & Lau, 2010), (Zeng, Zha, & Gong, 2006) found a positive relationship between fund size and performance of the equity funds.

Hypothesis 3: fund size is positively related to the mutual fund performance

Fund age

Fund age could play an essential role in the determinant of fund performance. Theoretically, younger funds may need high costs during their initial establishment period, such as doing the advertisement to attract new investors. This will cause younger fund has worse performance compared with a fund with a longer existence in a fund market. In addition, as increase experiences and social network, a mutual fund performs better. Furthermore, Babalos, Kostakis, & Philippas (2009) indicated that risk-adjusted returns are significantly positively related to the fund age, verifying that managers' and firms' experience tends to be valuable for increasing the fund performance. Therefore, we would like to assume that the fund age has impacted on Chinese fund performance. The following hypothesis is setting up:

Hypothesis 4: fund age is positively related on fund performance.

Expense ratio

The expense ratio indicates that the proportion of the fund's assets related to the expense of operating a mutual fund. The expense fee includes the investment advisory fee, the administrative expenses, 12b-1 distribution fees (market costs), and other operating costs. Golec (1996), Carhart (1997), Dellva & Olson (1998), Prather, Bertin, & Henker (2004) indicated that a negative relationship between fund's performance and expense ratios, which means, the investor pay a high expense fee to bring a low fund's performance. This issue can be explained by several reasons. One of the main reasons is a rational explanation. Berk & Green (2004) explained that manager's rewards were related to their managed assets. The fund manager was likely to get

higher compensations via holding more inflows fund assets. When a mutual fund performs better, the inflows money to their fund increase naturally. Indeed, the amount of total asset increase more than expense, and then lead to a low expense ratio. Therefore, we predict following hypothesis:

Hypothesis 5: fund expense ratio is negatively related to fund performance.

Turnover ratio

The turnover ratio is a measure of the number of times a fund manager trades during a given time period. For theoretical basis, a fund manager trades frequently that is likely to have more success compared with infrequently trade when investigation of open-end fund. The frequent trade, however, also exists some problems, such as taxes and transaction costs, and therefore reduces the return. In the recent empirical studies, Wermers (2000), Moskowitz (2000), Kacperczyk, Sialm, & Zheng (2005), and Tang, Wang, & Xu (2012) documented that the turnover ratio was positively significant related to fund performance. Based on theoretical and empirical study, the high turnover ratio leads to high fund performance. All in all, we predict the following hypothesis:

Hypothesis 6: fund turnover ratio is positively related to fund performance.

Management structure

Management structure can be set as a single-manager or team-manager. For theory aspect, Team management can bring a variant style and fair judgment, and even enlarge their professional skills and knowledge to deal with a broader range of information. Even more, team-manager with various backgrounds, cultures to cope different situations, and enhance fund performance, claimed by Bikhchandani, Hirshleifer, & Welch (1998). But with team management, free rider may occur. In addition, team management can prolong the decision making process since it will take longer time to reach an agreement within a team than with single management. Overall, we predict following hypothesis:

Hypothesis 7: In fund's management structure, the fund with team-manager has positively related to mutual fund performance.

Managerial education

Fund manager's education has been concerned a lot on mutual fund performance. With high level of education, the fund manager has better professional skill, knowledge and ability, and psychological quality to make an efficient and effective decision. Golec (1996) documented that the high level education of fund manager had better performance than those with low level educations, especially manager hold MBAs comparing with those without MBAs. Fund manager with holding MBAs degree has a sufficient knowledge background of management and financial areas. Therefore, we predict this hypothesis:

Hypothesis 8: fund manager with an MBA degree is positively related to fund performance.

3 Research method

3.1 Fund performance models

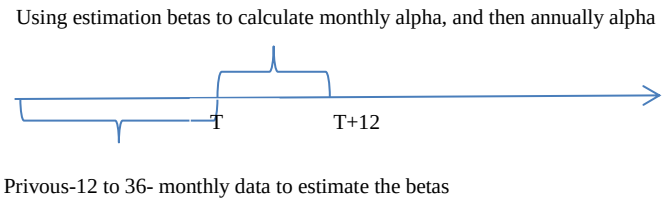
Before introducing the methodology, the way to measure fund performance is a critical issue in determinants the impact of fund characteristics and management attributes on mutual fund performance. Based on the previous literature review, the methods of measuring mutual fund performance are various. The main methods include: Market Benchmark Adjusted Model, the Single- and Multi-factor Risk Adjusted Model.

Mutual fund performance is measured usually by the intercept which calculate in a regression, also known as a fund's Alpha. From the prior most mutual fund investigation, a majority of researchers applied the CAPM based single index model to determinate the mutual fund performance, such as Lai & Lau (2010), Białkowski & Otten (2011) and Tang, Wang, & Xu (2012). The intercept of Alpha, also known as the Jensen's Alpha, widely interpret the measurement of a mutual fund over- or under-performance. However, only using the return of the market to describe the returns of the mutual fund is not sufficient compared with the multi-factor model. Therefore, a multi-factor CAPM was commonly applied in recent literature due to the diversity of investment style in a mutual fund. One better explanation of the fund performance model was introduced by Fama & French (1993), which is Fama and French 3-factor model. This model added two additional factors (SMB, and HML) into a single index CAMP model. Those two factors described the excess return difference between small cap and big cap, and excess return from a high book-to-market minus low, respectively. In the recent study, Carhart (1997) adjusted the Fama-French 3-factor model by extended one more factor that was a momentum anomaly. This factor measured the excess return between past winners and past losers. From several empirical studies examined e.g. (Otten & Bams, 2004), (Babalos, Kostakis, & Philippas, 2009), and (Lai & Lau, 2010), Carhart 4-factor model has become more effective and standard method to explain mutual fund performance.

For the investigation of mutual fund performance, there are several measurement horizons, such as 1-, 3- and 5-year horizons. The majority of literatures applied three-

year previous data to estimate the Betas, and calculate abnormal mutual fund performance in developed markets, such as Elton, Gruber, & Blake (1996), Carhart (1997), and Kosowski, Timmermann, Wermers, & White (2006). Due to a short span of time on the mutual funds market, however, one year measurement horizon is one of the major methods to determinate the Betas, and calculates abnormal mutual fund performance, claimed by Prather, Bertin, & Henker (2004), Lai & Lau (2010), and Białkowski & Otten (2011). When applying a longer historical fund return, measurement of a fund's performance can lead to more accurate inferences. Nevertheless, some disadvantages exist, especially in emerging market, when using of longer measurement horizons. One of the main disadvantages is a small sample size. For instance, applying the historical of three-year return, there are only 18 equity mutual funds data that exist at the end of 2006 over an extended period in China mutual fund industry, and this may cause to other statistical biases. Another main disadvantage is that fund performance will change over time, especially under different market time periods. On the other hand, applying higher frequency data (such as daily-, weekly- returns) can lead to more accurate estimation of mutual fund performance, but it's limited. Thereafter, it is necessary to consider more accurate ways to estimate mutual fund performance based on the short span time of Chinese mutual funds market. We adopt the method that is mentioned by Huij & Verbeek (2007), the calculation of betas are conduced by using pervious at least 12- to at the most 36- monthly return data. As follows, the figure 3.1 indicates the methods to calculate the annual Alpha for the observation year from 2006 to 2010, respectively.

Figure 3.1: An outline of the estimation betas and alpha processes



Where: T is a month; the annual alpha for a period T to T+12, its indicted observation year.

In the sake of easy understanding, For example, if a fund has a monthly return available on 05-31-2005, we can conduct 20-monthly observations to estimate beta on January of 2007. We assume that the Betas are constant over following one year period. This means Beta is used to compute monthly Alpha (between t and t+12). And then calculate this month's Jensen's Alpha that is in a unit of % as monthly fund performance on January of 2007 using monthly- raw return, -risk free rate and – market return. Afterwards, we collect each month Jensen's Alpha for 2007 whole year period. Consequently, the annually Alpha is compounded by 12-monthly Alpha as a measure of fund performance.

To measure mutual fund performance, in order to investigate whether the different ways mutual fund performance will influence the result, we will use the following two different models: Market Benchmark Adjusted Model and single CAPM model. Those two models are as follows: (2) and (3). In this thesis, the equity mutual fund performance is calculated by using monthly raw return (1), which includes the dividend. This formula is defined by Guo' Tai' An Database[11].

Market benchmark adjusted return:

$$AR_{itm} = R_{it} - R_{mt} \quad (2)$$

Where: AR_{itm}: is t period mutual fund I's market adjusts return; R_{mt}: is t period market return (in this thesis, firstly, we use R_{mt} = 40% * Shanghai Composite Index + 20% * Shanghai Government Bond Index + 40% * Shenzhen Component Index), there are several articles mentioned see e.g. Zeng, Zha, & Gong (2006), Jin & Wu (2007). Moreover, after June 2004, when the new law of the People's Republic of China on equity mutual funds was carried out, the item of equity mutual fund has been canceled that invest at least 20% of its assets in the government bonds. Until

[11] The return of the open-end equity mutual fund in period t (R_{it}) can be obtained as follow:

$$R_{it} = \{\frac{N_{it}}{N_{it-1}} \prod_{t=1}^{n} \left(1 + \frac{D_t}{N_t}\right)\} \quad (1)$$

Where: R_{it} : is t period mutual fund I's return; N_{it}: is unit NAV at the end of calculation period t; D_t: is dividend amount of unit fund at time point t; N_{it-1}: is unit NAV at the beginning of calculation period. N_t: is unit NAV at t^{th} dividend distribution for dividend reinvestment calculation. n: is dividend frequency.

now, a majority of equity mutual funds do invest approximately 10% of their total assets on bond fund. Additionally, the Shanghai Government Bond index reflects to Chinese bond market changes as a whole. Therefore, we adopt a new way of calculating market benchmark return (R_{mt} = 45% * Shanghai Composite Index + 45% * Shenzhen Component Index + 10% * Shanghai Government Bond Index) to adjust equity mutual fund returns, and do the robustness check whether the equity fund performance is consistent with the same results.

Jensen's Alpha:

Jensen's Alpha is based on the Capital Asset Pricing Model (CAPM). This is a way to determine the abnormal return that we can know the returns of actively-managed funds are under- or over market returns. When Jensen's alpha is positive, the fund has beaten market, vice versa. The portfolio beta with using previous at least 12- to at the most 36- monthly return data and running the ordinal-least square regression of the following equation (3) can be estimated. It describes the volatility of the portfolio with respect to the market. And then get the monthly abnormal return (Jensen's Alpha):

$$R_{it} - R_{ft} = \alpha_i + \beta_m(R_{mt} - R_{ft}) + \varepsilon \quad (3)$$

Where R_{it} : is t period mutual fund I's return; R_{ft} the risk free rate (the one-year bank deposit rate); R_{mt}: is t period market return (in this thesis, we use the above mentioned market index); α_i: is Jensen's alpha, the performance measure; β_m:is beta as systematic risk of the its portfolio in Chinese market.

Finally, we take the monthly return of one-year bank fixed deposit rate as the proxy risk free rate. With respect to market benchmark returns, we use two measures of market benchmark returns. First benchmark is calculated by 40% *Shanghai Composite Index + 20% * Shanghai Government Bond Index + 40% * Shenzhen Component Index. Second benchmark is composed by 45% * Shanghai Composite Index + 45% * Shenzhen Component Index + 10% * Shanghai Government Bond Index. The aim of adopting a second benchmark is to do the robustness check. Two ways of performance measurement are based on the monthly data. Consequently, the annual fund performance is compounded by 12-monthly returns.

3.2 Regression analysis

In this thesis, I would like to investigate fund-specific characteristics and managerial attribute influencing on equity fund performance. Several previous literatures e.g. Prather, Bertin, & Henker (2004), and Karagiannidis (2010) were applied an Ordinary-Least-Square (OLS) regression, which is an essential methodology applied for financial problems to examine a causal relationship such as fund-size/ -age on fund performance. Indeed, Moutinho & Hutcheson (2011) indicated that this regression can be applied to single- or multiple variables, and also easily check the model assumptions, like constant variance and the impact of outliers. Moreover, for investigation of causal relationship, most researchers conduct pooled cross-sectional study by combining time series data. It can be assumed that individual or multivariate factors could be predicted the mutual fund performance during a period of time. There are several advantages. One of the main advantages is to increase the sample size by having repeated observations. Another main advantage is that pooled models can examine the effects of change over time, and even test multiple and complex hypotheses. As we discussed above, the primary investigative method I follow in this thesis is pooled cross-sectional via Ordinary-Least-Squares regression model.

Obviously, mutual fund performance is the dependent variable. And then fund characteristics and managerial attributes are independent variables. In this thesis, the main research methodology is applied multi-regression model, which can provide more information to explain the relationship between dependent variable and independent variables. After that, R-square will be applied to check the goodness of fit between predictor variables and mutual fund performance. Initially, we will apply following regression to examine the overall sample period. And then investigate deeper into the differences in bull- and bear-market periods, in order to find which factor is the most relevant influencing on mutual fund performance under different market periods. Below is referring, we consider the multiple-regression (5) for each of the two performance metrics. This is our main research method in this thesis.

$$\alpha_{i,t} = \alpha + \beta_1 LOGsize_{i,t} + \beta_2 LOGage_{i,t} + \beta_3 ExpenseR._{i,t} +$$

$$\beta_4 TurnoverR._{i,t} + \beta_5 Dummy\ Mstructure_{i,t} + \beta_6 DummyMeducation_{i,t} + \varepsilon_{i,t} \quad (5)$$

Where: $\alpha_{i,t}$: is the measure of fund performance; α = constant; $LOGsize$: is the denary logarithm of the fund total net assets at the end of year t; $LOGage$: is the denary logarithm of the fund age at the end of year t; $ExpenseR.$: expense ratio for the fund i at the end of year t (examining in annual data); $TurnoverR.$: is turnover ratio for the fund I during t period; $Dummy\ Mstructure$: is a dummy variable (0 = single manager, and 1 = team-manager); $DummyMeducation$: is a dummy variable (0 = without MBAs, and 1 = holding MBAs) and $\varepsilon_{i,t}$: is a random error term. Considering the potential for interrelationships among these independent variables, we analyze their multicollinearity. Based on the above model, our six hypotheses can be tested. Hypothesis 3, 4, 6, 7 and 8 predicts β_1 , β_2 , β_4, β_5 and β_6 to be positive, respectively. Hypothesis 5 predicts β_3 to be negative.

4 Data collection and statistics description

4.1 Sample selection and data source

Since I mainly concentrated on the China's open-end equity mutual fund with actively-managed, the dataset of this thesis is based on primary and secondary data such as database, annual report and website. Firstly, like most authors of investigating the mutual fund performance, they applied the database to retrieve the data. From the database, it is a time-effective and –efficient way to get the necessary data, because it contains lots information that a researcher need, such as fund monthly return. Second, reviewing the website also plays a critical role, it can provide additional information that the database cannot clearly define, like managerial attritions. Last but not least, the functions of the annual report provide some robustness' information to complete our sample data.

In this thesis, all available Chinese open-end equity mutual funds monthly return, risk-free rate and total fund assets were collected from Guo'Tai'Jun'An (GTA) database, which also is named China Securities Market & Accounting Research (CSMAR). GTA is a leading global provider of China financial market data, China industries and economic data. The market return was composited by hand-collection from website (finance.sina.com.cn). For other explanatory variable, fund age, expense ratio, turnover rate, management structure and fund managerial education have been hand-calculated based on GTA database and website (Chinafund.cn).

We obtained the all Chinese open-end equity mutual funds from CSMAR mutual fund data in Guo'Tai'Jun'An (GTA) database during January 2006 - December 2010. Due to study Chinese open-end equity fund, some fund invests outside of the Chinese market that will be excluded. Further, as managerial style difference, concerned with activity-managed fund, the passively-managed fund also is called as an index fund (Exchange-Traded Funds) that will be excluded from our sample. We will eliminate funds with missing important data, like raw monthly return. When investigating the mutual fund, the survivorship bias is a well-indicated issue in many previous studies. Many empirical studies showed that survivorship bias can influence the result in average performance measures, because the sample only includes survivor mutual

funds but not dead mutual funds during the observation period. Brown et al. (1992) indicated that the average performance is overstated because of losing the poor or bad fund in the database. From the database, we cannot find dead fund. Therefore, the survivorship bias may exist in our investigation.

According to the above criteria stated, the sample is gathered. The following refers to the thing that summarizes the retrieve:

- 345 open-end equity mutual funds in Chinese market until the end of 2010;
- 325 open-end equity funds left, after excluding funds (QDII) with invested in foreign stocks;
- 249 equity mutual funds left, after excluding fund with passively-managed (Exchange-Traded Funds);
- The duration of equity mutual funds less than continuous operation two years should be excluded from the sample because of the way of calculation CAPM alpha.
- Equity mutual funds will be eliminated, when important data, like a raw monthly return is missing.

Therefore, our sample has 157 equity mutual funds left. The combined dataset amounts have a total of 456 annual observations for 157 equity funds during the period of 2006-2010. All the data are from CSMAR Mutual Fund[12] Database. And then those data are analyzed with MS Excel and IBM SPSS software.

After retrieving the database based on above mentioned criteria. As follows, Table 4.1 presents some characteristics of our sample during the period 2006-2010. It is worth noting that the total assets of equity fund under management showed a very large variation, dramatically rising from 1755.95 million Yuan in 2006 to 12538.01 million Yuan at the end of 2007, and then significantly falling to 5367.81 million Yuan at the end of 2008. The raw returns of open-end equity funds were in line with the market returns. One interesting observation we found that one average of market returns achieved a higher performance compared with the open-end mutual fund

[12] CSMAR Solution website: http://csmar.gtadata.com/p/user/home.aspx

during 2009, which figures indicated 71.40% and 65.80%, respectively. This indicated that on average actively-managed fund cannot beat to market. Therefore, the index funds increased dramatically after 2009.

Table 4.1 our sample of Chinese open-end equity mutual fund with actively-managed from 2006-2010 periods

Year	No. funds	Av. Fund size (total assets) Mil. Yuan	Number of investment companies	ER returns	MB returns
2006	**31**	**1755.94**	**57**	**118.88%**	**95.86%**
2007	**52**	**12538.01**	**58**	**120.40%**	**95.83%**
2008	**92**	**5367.81**	**60**	**-50.23%**	**-54.92%**
2009	**124**	**8402.48**	**60**	**65.80%**	**71.40%**
2010	**157**	**6081.13**	**62**	**5.21%**	**-8.42%**

Notes: this table presents our sample of Chinese open-end equity funds with actively-managed during the period 1st, Jan. 2006-31st, Dec.2010. Fund size (total asset in Million Yuan) they helmed. ER returns represent the mean of the fund's raw return for each year, while the MB returns stand for the return of the market returns (40% * Shanghai composite index+ 20% * Shanghai Government Bond index + 40% * Shenzhen component index)

4.2 Variable definitions and descriptive statistics

The raw fund return and dependent- variable, according to the literature review, which are defined, and then calculated in the following ways.

1. Raw return reflects a fund's performance for the holding period including dividends. It directly collected from Guo'Tai'Jun'An (GTA) database.
2. Fund size: total assets for a fund at the end of time t.
3. Fund age simply expresses the number of years that a fund has been founded.
4. The expense ratio is calculated total fund expenses as a percentage of average fund net assets. Specifically, total fund expenses include manager fee, exchange fee, interest pay and other fee.
5. Turnover ratio is a measure of trading activity. There are two ways to calculate turnover ratio. Firstly, turnover ratio_1 is calculated as the minimum of annual purchases or sales stocks are divided by the average annual amount of fund wealth. Secondly, for robustness test, turnover ratio_2 calculated as the sum of annual purchases and sales stocks are divided by the average annual amount of fund wealth.

6. Management structure: it represents simply the number of managers under a fund. If two or more managers under a fund helm more than half years during a whole year period, we assume that management structure is a team-manager, vise verse. Therefore, single manager=0, team-manager=1.
7. Managerial education: it indicates that manager with MBAs degree or not. In team-manager, if one of manager with MBAs degree helm more than half years during a whole year period, we assume that fund manager holds an MBA degree, vise verse. Therefore, manager(s) under a fund without MBAs=0, manager(s) under a fund with MBAs=1.

Following table 4.2 presents a summary of the descriptive statistics for fund characteristics and managerial attributes as the employed variables. In order to control the extreme value, we compare the median value and the mean value for each attribute. Panel A indicates the statistics by full sample period for all 460 fund-year observations. As can be seen in Panel A of table 4.2, the mean and median of raw fund return are 31.37% and 9.72% respectively. Although dispersion exists relatively high, both figures are positive. Moreover, the mean and the median annual expense ratio indicated quite similar figure, which means no extreme value. The average fund age is relatively young (4-year old). The figures of fund size and turnover ratio exist extreme value because of the high dispersion. For managerial attributes, the majority of funds are managed by single manager and a manager without MBA degree.

To have in-depth insights of these variables, the sample period was further divided into different market periods. See Panels B and C of Table 4.2, those present the same information for the fund's characteristics and managerial attributes under bear- (2008 and 2010) and bull- (2006, 2007 and 2009) market periods. Those different market time periods were defined by Cao, Huang, & Zhang (2011). The most key difference between both groups is the raw return of the funds. The median of raw returns under bear- and bull-market are 1.77% and 77.91% respectively. The dispersion of both groups is approximately 76% per annual. From this, the raw return of funds under bull-market period have significantly high compared with under bear-market period, indicating that the Chinese economy exists large uncertainty. With respect the rest characteristics, the results show similar situation compared with under the overall sample period.

Table 4.2 Summary statistic of open-end equity mutual fund in China from 2006-2010 periods

This table presents the summary statistics for fund characteristics and managerial attributes. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII- funds from 2006 to 2010. Panel A presents the descriptive statistics for all 456 fund-year observations in the dataset during the full sample period. The raw returns are annualized, the total expense ratio, turnover ratio, the fund size (total assets/ net asset), and the fund age in years. The management structure and managerial education is dummy variable. The panel B and C present the same statistics, however, under different market periods, which are bear- and bull-market periods respectively.

	Mean	Media	Max	Min	S.D.
Panel A: whole sample	**456 annual ob. (From 2006-2010)**				
Raw return (p.a.) %	**31.37**	**9.72**	**189.90**	**-66.42**	**59.24**
Expense ratio (p.a.) %	**2.66**	**2.45**	**9.04**	**.04**	**1.02**
Fund size (total assets) Mil. Yuan	**7010.73**	**5177.32**	**41818.09**	**66.71**	**6737.55**
Fund age (years)	**4.00**	**3.69**	**9.28**	**2.01**	**1.53**
Turnover ratio_1 (p.a.) %	**54.00**	**27.75**	**720.00**	**0.00**	**78.54**
Turnover ratio_2 (p.a.) %	**147.67**	**80.15**	**1541.90**	**7.60**	**184.00**
Management structure	**.26**	**.00**	**1**	**0**	**.44**
Managerial education	**0.22**	**0.00**	**1**	**0**	**.41**
Panel B: Bear Market period	**249 annual ob. (including 2008, 2010)**				
Raw return (p.a.) %	**-15.28**	**1.77**	**19.23**	**-66.42**	**27.33**
Expense ratio (p.a.) %	**2.48**	**2.33**	**6.57**	**.04**	**.68**
Fund size (total assets) Mil. Yuan	**5817.58**	**4358.24**	**26312.84**	**75.90**	**4857.60**
Fund age (years)	**4.16**	**3.96**	**9.28**	**2.05**	**1.64**
Turnover ratio_1 (p.a.) %	**38.25**	**24.40**	**272.50**	**.00**	**44.02**
Turnover ratio_2 (p.a.) %	**100.23**	**62.00**	**564.70**	**8.80**	**101.24**
Management structure	**.29**	**0.00**	**1**	**0**	**.45**
Managerial education	**.24**	**0.00**	**1**	**0**	**.43**
Panel C: Bull Market period	**207 annual ob. (including 2006, 2007, 2009)**				
Raw return (p.a.) %	**87.49**	**77.91**	**189.90**	**31.13**	**32.50**
Expense ratio (p.a.) %	**2.88**	**2.58**	**9.04**	**.05**	**1.29**
Fund size (total assets) Mil. Yuan	**8445.98**	**6073.70**	**41818.09**	**66.71**	**8250.27**
Fund age (years)	**3.80**	**3.48**	**8.28**	**2.01**	**1.35**
Turnover ratio_1 (p.a.) %	**72.92**	**40.20**	**720.00**	**.00**	**103.12**
Turnover ratio_2 (p.a.) %	**204.73**	**132.90**	**1541.90**	**7.60**	**237.55**
Management structure	**.22**	**.00**	**1**	**0**	**.42**
Managerial education	**.20**	**.00**	**1**	**0**	**.40**

4.3 Multicollinearity

As previously mentioned our methodology, the model is applied a pooled ordinary least squares regression (OLS) with the market benchmark adjusted return or Jensen's Alpha as the dependent variable, while firms-specific characteristics and managerial attribute as explanatory variables. There are seven explanatory variables that we are prior state in the methodology section. For the sake of the model fit well, we should firstly consider the potential collinearity among those independent variables. Therefore, the multicollinearity test should be tested. Table 4.3 presents the information about correlations of those independent variables.

Table 4.3 Correlation matrix of independent variables

	1	2	3	4	5	6	7
1 Fund age*	1	-.003	-.014	-.108	-.130	.010	-.060
2 Total assets*		1	-.254	-.240	-.222	.069	-.013
3 Expense ratio			1	**.668**	**.629**	.009	.036
4 Turnover ratio 1				1	**.972**	-.095	-.024
5 Turnover ratio 2					1	-.106	-.029
6 Management Structure						1	.219
7 Management education							1

Pearson correlation coefficients for fund-specific characteristic and management attributes are analyzed from 2006 to 2010. Some variables with an asterisk (*) are calculated in logarithmic. Further, independent variables are marked boldface, which indicated high correlation.

As a result of the majority of variable correlation are below 0.30, the issue of multicollinearity presents not serious. One correlation is noteworthy. The expense ratio is positively correlated with two ways of turnover rate, implying that the high frequency of trading activity can lead to high costs. For the independent variables with the highest correlations, in doing so, we will apply two separate regression analyses to avoid multicollinearity problems, thus deal with the impact of changing the sign and magnitude issue. The first regression includes expense ratio which is replaced by turnover ratio 1 in turn in the second pooled cross-sectional regression. Finally, the correlation analysis documents a high degree of multicollinearity between turnover ratio 1 and turnover ratio 2. Therefore, turnover ratio 2 is considered to do a robust test in the third pooled cross-sectional regression. Consequently, as discussed the multicollinearity between among independent variables, we apply three regression models which include five variables for each model.

5 Empirical research and analysis

5.1 Fund performance measure

As pointed out already in the methodology section, two ways of performance measurement are adopted: market benchmark adjusted model and single Capital Asset Pricing Model (Jensen's Alpha). In order to construct of the market benchmark adjusted model, we should consider the market benchmark return. In our thesis, we used a market return that is constructed by 40% * Shanghai Composite Index + 20% * Shanghai Government Bond Index + 40% * Shenzhen Component Index. This form of market return is mentioned by Zeng, Zha, & Gong (2006), Jin & Wu (2007). In regard of Jensen's Alpha, the excess market returns we should concern that are the return on the market return in excess of risk-free rate. Firstly, market returns we adopt before state (40% * Shanghai Composite Index + 20% * Shanghai Government Bond Index + 40% * Shenzhen Component Index). Secondly, risk free rate is measured by the one-year fixed bank deposit rate.

Table 5.1 summary of the two estimated abnormal return over the period time

This table presents the summary of the two estimated abnormal annual return. The sample includes all Chinese open-end equity mutual funds with actively-managed by excluding index-, QDII- funds from 1st, Jan. 2006 to 31st, Dec. 2010. Panel A presents descriptive statistics for all 456 fund-year observations in the dataset during the full sample period. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. These two measurements are in a unit of % per annual. The panel B and C present the same statistics, however, under different market periods, which are bear- and bull- market periods, respectively.

	Mean	Median	Max.	Min.	S.D.
Panel A: whole sample	**456 annual ob. (From 2006-2010)**				
Market benchmark adjusted (p.a.) %	**6.96**	**8.52**	**54.33**	**-24.13**	**11.62**
Jensen's alpha (p.a.) %	**8.98**	**8.55**	**92.78**	**-28.97**	**14.96**
CAPM beta	**.92**	**.94**	**1.36**	**.51**	**.13**
Panel B: Bear Market period	**249 annual ob. (including 2008, 2010)**				
Market benchmark adjusted (p.a.) %	**10.28**	**10.50**	**54.33**	**-24.13**	**8.60**
Jensen's alpha (p.a.) %	**8.12**	**9.78**	**51.13**	**-28.97**	**9.08**
CAPM beta	**.93**	**.95**	**1.36**	**.57**	**.13**
Panel C: Bull Market period	**207 annual ob. (including 2006, 2007, 2009)**				
Market benchmark adjusted (p.a.) %	**2.98**	**2.04**	**48.38**	**-23.91**	**13.41**
Jensen's alpha (p.a.) %	**10.02**	**4.39**	**92.78**	**-24.38**	**19.82**
CAPM beta	**.91**	**.94**	**1.25**	**.51**	**.14**

This table includes the mean, median, minimum, maximum, and standard deviation of abnormal return. The Jensen's alphas are estimated using the single CAPM with monthly return data from 1st, Jan. 2005 to 31st, Dec. 2010.

Table 5.1 provides a summary of the estimated annualized abnormal returns over the period from 1st, Jan. 2006 to 31st, Dec. 2010. Included in the table the first two columns report the mean and median of two measures of fund performance. The last three columns indicate the standard deviation, the minimum and maximum. See Table 5.1 (panel A), the median fund presented a relatively similar between Market benchmark adjusted returns and Jensen's Alpha (8.52% and 8.55% p.a. correspondingly). Even though the dispersions of those two measures of fund performance are quite high, the mean and median fund exhibits a relatively similar. Therefore, there are no extreme values over the examined period. With respect to CAPM beta, the median fund exhibited a 0.92. Panels B and C of Table 5.1 exhibit the same information with Panel A, indicating the two subgroups under different market periods. One more interesting observation is that the mean and median of Jensen's Alpha (10.07% and 4.39% p.a. respectively) under bull market period. The difference of approximately 6% p.a. verifies that the extreme values exist.

Panel A in Table 5.1 indicates whole sample during the overall period. These results present that the majority of funds are positive under market benchmark adjusted measurement (median: 8.52%) and Jensen's Alpha (median: 8.55%). The result is consistent with Tang, Wang, & Xu, (2012), indicated that Chinese open-end equity fund on average can beat the market because of positive abnormal return (market adjusted return: 10.5% and Jensen's Alpha: 22.1% per semi-annual). Hence, hypothesis 1 can be supported by our results.

Panel B and C of Table 5.1 show results from different market periods. More interestingly, with respect to market benchmark adjusted returns, funds under the bear market period have better performance compared with under the bull market, indicating the media of annualized returns are 10.50% and 2.04% of bear- and bull-market, respectively. This puzzle can be explained by the ability of risk taking. More specifically, fund managers are unable to immediately adjust their investment strategy to achieve better performance after recovering of market performance, while fund managers are good at risk control or diversification after the deterioration of market performance. Additionally, the median fund exhibited a CAPM beta of 0.95 and 0.94 under bear and bull market condition, respectively. This further indicates that the

majority of fund managers in China is likely to keep conservative investment strategy under examined period, especially under bull markets period. According to the fund performance under different market periods, Chinese open-end funds on average are outperformance under bear- as well as under bull-market period. This result is consistent with Jin & Wu (2007), indicated that on average equity funds were able to beat to the market under both two market conditions. Therefore, our results can support to hypothesis 2.

5.2 Cross-sectional analyses

Multivariable regressions are performed to examine which fund characteristics and management attributes could explain open-end equity mutual fund performance. Since expense ratio and turnover ratio are highly correlated, we apply two regression models; the first regression includes expense ratio which is replaced by turnover ratio 1 in turn in the second pooled cross-sectional regression. For the sake of well understand the impact of fund characteristics and management attributes on fund performance, we begin our investigation by examining the full sample during the whole period. And then we test for the different market conditions to measure whether those results remain the same.

5.2.1 Explanatory variables and performance under overall sample period

Table 5.2, indicates the pooled OLS regression results, which includes two models that previously mentioned. This pooled analysis considers full sample over the whole period into one pooled cross-sectional study. Our results reveal the critical information of fund characteristics and management attributes influencing on fund performance. And also we use two different measures to estimate the abnormal return, which can give investors more wide suggestion of open-end equity mutual fund investment.

For fund size, the total asset coefficient is negatively significant related to Jensen's alpha, indicating that low fund size can bring to superior performance. Our result is consistent with some previous studies, such as Chen, Hong, & Kubik (2004), and Tang, Wang, & Xu (2012), demonstrated that the fund size was negatively significant related to fund performance. However, from recent empirical study, Białkowski &

Otten (2011), Lai & Lau (2010), and Zeng, Zha, & Gong (2006) found a positive relationship between fund size and performance of the equity funds. This difference may be due to differences in study periods or methodology. There are several possible reasons to explain our result. On the one hand, the possible argument for this result is that the Chinese mutual industry rise dramatically, so as to some large funds have liquidity constraints issue. More specifically, it will tend to difficultly trade (buy or sell) at an ideal price, and also lead to high trading costs in the meantime. On the other hand, the structure of the firm also can lead to the negative relationship between fund size and performance. Usually, larger firms tend to higher bureaucracy, hierarchy and related coordination costs. Therefore, organizational diseconomy and liquidity constraints will erode fund performance. Our result cannot support to hypothesis 3.

Table 5.2 Fund characteristics and management attributes influencing on fund performance over the whole sample period

This table presents the fund characteristics and management attributes influencing on fund performance. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII-funds from 2006 to 2010. Funds less than 24 months are excluded from our sample. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. We adopt the OLS method to run the pooled cross-sectional regression. Model 1 includes expense ratio, while Model 2 presents turnover ratio instead of the expense ratio. Numbers in parentheses are t-statistics. *, ** and *** indicated significance at the 10%, 5% and 1% level, respectively.

Independent variable	Dependent variable			
	Market benchmark adjusted return		**Jensen's alpha**	
	Model 1	***Model 2***	***Model 1***	***Model 2***
LOGTA	.141 (.130)	1.595 (1.490)	**-3.030** **(-2.202)****	-.473 (-.350)
LOGAGE	-4.518 (-1.322)	-3.080 (-.904)	**-11.423** **(-2.636)*****	**-8.996** **(-2.091)****
EXPENSE R.	**-1.122** **(-.611)****		**-2.127** **(-3.052)*****	
TURNOVER R._1		**.025** **(3.504)*****		**.042** **(4.642)*****
MANAGEMENT STURCURE	-.778 (-.611)	-.502 (-.396)	-1.926 (-1.191)	-1.476 (-.923)
MANAGER EDUCATION	-.234 (-.173)	-.225 (-.169)	-1.145 (-.670)	-.1.147 (-.680)
Adjusted R^2	.004	.021	.034	.059
F value	1.360	2.992	4.199	6.706
No. of observations	456	456	456	456

The fund age coefficient is negatively significant related to Jensen's alpha. Our result is consistent with Otten & Bams (2002), indicated that a signifiacntly negative relationship between the fund age and risk-adjusted performance. But our finding is in contrast to Babalos, Kostakis, & Philippas (2009), demonstrated that a positive relationship between fund age and performance. This difference may be due to reasons such as sample selection and study period. According to our hypothesis, as accumulated managerial experiences and social network as well as better understanding of the Chinese mutual fund industry, a long-established mutual fund may perform better. However, our finding suggests that Chinese equity fund performance decreases as age progress, and believe younger funds perform better than older funds, which is probably caused by increasing the complexity of the fund operation. Specifically, as mutual funds grow older, they tend to set hierarchy, slack the fund operation. Thereafter, managers helm funds effectively and efficiently even difficulty. Those reasons may erode fund performance. Therefore, hypothesis 4 cannot be supported by our result.

The expense ratio is negatively and strongly significant related to two different measures of fund performance. Based on our results, the impact of the expense ratio is much more significant on fund performance compared with other explanatory variables, such as fund size and age. Our result is consistent with the majority of previous studies, such as Golec (1996), Carhart (1997), Dellva & Olson (1998), Prather, Bertin, & Henker (2004), indicated that a negative relationship between fund's performance and expense ratios. There are several conjectures. One of the main reasons is the behavior of fund managers. The fund managers are rewarded with inflows money to their funds, and managing more assets. In China, for instance, fund managers can achieve 2.5% of total assets as their compensations. When a mutual fund performs better, the money inflows to their fund increase naturally. Indeed, the amount of total asset increase more than expense, and thus the expense ratio will decrease. On the other hand, Javier & Pablo (2008) argued that unsophisticated investors who did not make optimal use of all available information when making their investment decisions, and thus led to a high expense ratio. More specifically, unsophisticated investors prefer to accept the information on fees in the format that is given by fund firms rather than the cognitive effort to understand it. Indeed, Javier &

Pablo (2008) documented that worse-performing funds charged fees equal or even higher than those setted by better-performing funds. Hence, the relationship between fund performance and expense ratio is negative. Overall, one of the most important factors that the individual investors should be concerned, is expense ratio. When a fund holds a high expense ratio, the investor need to avoid this fund. This result can support to our hypothesis 5

The discussion of the turnover ratio as follows, the coefficient is positively and strongly significant related to market benchmark adjusted returns and Jensen's alphas. The two turnover coefficients of 0.025 and 0.042 suggested that for every 100 basis-point increase in turnover, market benchmark adjusted returns and Jensen's Alphas increase by about 2.5 and 4.2 basis-points, respectively. This means that highly frequent trading can lead to better fund performance, which is consistent with the recent empirical studies in emerging markets, such as Wermers (2000), Moskowitz (2000), Kacperczyk, Sialm, & Zheng (2005), and Tang, Wang, & Xu (2012). But our result is in contrast to Carhart (1997), Edelen , Evans , & Kadlec (2007), Haslem , Baker , & Smith (2008) in developed markets, documented that the impact of turnover ratio is significantly negative related to risk-adjusted returns. The main difference with respect to market efficiency in emerging markets and developed markets. Accordingly, Yu, Li, & Wang (2009) argued that the Chinese stock market is in a weak-form efficiency stage. Therefore, institutional investors (such as, fund managers) have information advantages that are enabling them to make stock timing and rational judgments about the stock market to achieve superb performance via trading (buy and sell) frequently. Our result indicates that a fund manager trades frequently that is likely to have more success to generate the high performance. This result can support to our hypothesis 6.

Turning to the management variables based on two measures of fund performance, the management structure coefficient is negative on average, but not significant. This demonstrates that team management does not significantly impact on fund performance. Our results are consistent with Prather & Middleton (2006), and Karagiannidis (2010), indicated that do not find any differences in fund performance between the performance of single-manager and team-manager. Karagiannidis (2010)

argued that some equity mutual funds would like to achieve the potential benefits from adopting a team-manager. However, if the team-managers do not immediately decide the investment strategy, the fund performance will erode. Therefore, the main purpose of adopting team-managers are simply the result of effective advertisement and public relations network, which can bring more individual investors into their funds, but not significant result higher fund performance compared to do single-manager according to our finding. Therefore, this result cannot support to our hypothesis 7.

For managerial education variable, the outcome indicates that the coefficient is negative and insignificant related to two different measures of fund performance. This suggests manager with MBAs degree cannot contribute to better fund performance. Our result is consistent with Chevalier & Ellison (1999), asserted that there was no difference in the performance of managers who hold MBAs degree compared with who did not. However, our finding is in contrast to Golec (1996), documented that fund managers with MBAs degree can achieve better abnormal return compared with fund manger without MBAs degree. One obvious explanation for our finding is that managers who hold MBAs degree may not be more knowledgeable and intelligent than other managers in China. This may be due to the quality of MBA programs. According to Gottesman & Morey (2006), claimed that only manager with MBAs degree from top 30 MBA programs can achieve better fund performance in the U.S. However, in China, students can easily enter into low-level MBA school as well as get a degree. Hence, according to our result, managers with MBAs degree do not achieve better in terms of mutual fund performance. Our result cannot support to hypothesis 8.

In conclusion, the outcomes from Table 5.2, only the impact of the expense ratio and turnover ratio on fund performance are consistent with the hypotheses that we built in the previous section see 2.3, while the results of fund size, age and management attributes are in contrary to our hypotheses. Finally, our models are better fit for Jensen's Alpha than Market benchmark adjusted returns. This is illustrated by the value of adjusted R-squares and F-statistics reported in Table 5.2. Additionally, even when turnover ratio is used, the adjusted R-square and F-statistics are only approximately 6% and 6.706, respectively. Our result is similar with Prather,

Bertin, & Henker (2004), documented very low explanatory power (approximately 7%). This relative low explanation power leaves space for additional analysis. Therefore, as follows, we adopt different market conditions as two subgroups to re-estimate our analysis.

5.2.2 Explanatory variables and performance under different market conditions

As to compare different market period results to prior whole sample period investigation, we carry out this analysis by focusing on the impact of fund characteristics and management attributes on performance under the bear- and bull-market periods. In this analysis, we explore the same performance measures with before used, which include market benchmark adjusted returns and Jensen's Alphas. And also the same methodology is applied. When we report results, our two subgroup sample sizes include the bear market period of 249 fund-years and the bull market period of 207 fund-years. Table 5.4 Panel A and B present the outcomes for the impact fund characteristics and management attributes on performance in the bear and bull markets, respectively.

Panel A of table 5.3 presents the result of the bear market period. One interesting observation, the coefficient of size is positively significant related to market benchmark adjusted returns and Jensen's Alpha in Model 2, but not in Model 1. As we re-examine the correlation matrix of those independent variables under bear market, see appendix C, verifying that fund size is negative correlated with turnover ratio. This correlation is noteworthy that when a mutual fund increase total assets, the turnover ratio will decrease, implying a large fund faced liquidity constraints under bear market due to low trading activity. Therefore, we exclude turnover ratio, our result show that there are no relationship between fund size and both two measures of fund performance, see appendix D. The fund age coefficient is positively significant related to market benchmark adjusted returns, while no significant related to Jensen's alpha, verifying that long-establish fund have more accumulated managerial experiences and social network as well as better understanding of the Chinese mutual fund industry to diversify their risk under bear market period. Therefore, long-establish funds can generate better the market benchmark adjusted returns.

Turning to expense ratio[13], the coefficient is postively significant related to market benchmark adjusted returns, while positive but insignificantly related to Jensen's Alpha. According to market-adjusted returns, fund managers who are able to achieve outperformance on their portfolios charge higher compensation from their shareholders under bear market period. Furthermore, the expenditures of fund tend to carry on marketing and research in order to generate higher excess return. For turnover ratio, likes the results from examined prior overall sample period, the coefficients are positively significant related to market benchmark adjusted returns and Jensen's Alphas. Finally, this provides slight evidence to support a positive relationship between team-manager and market benchmark adjusted returns, indicating that the coefficients of team-manager is 2.048 and significant level at 10%, implying that team-manager under bear market period can enhance fund performance due to reasons that various backgrounds, fair judgement, and social network to access more investment and market information.

Panel B of table 5.3 shows the regression result when equity mutual fund under the bull market period. Again, we also re-examine the correlation matrix of those independent variables, see appendix C. This result is consistent with the main result in section 4.3 that the expense ratio is still positive correlated with both turnover ratio. The fund size coefficient is negatively significant related to Jensen's Alphas. This result is consistent with previous main finding, implying that this result is likely to be caused by the liquidity constraints as the Chinese open-end equity mutual fund increase dramatically. We also find a negative relationship between fund age and two measures of fund performance (market benchmark adjusted return and Jensen's alphas), which is in contrast to the result under bear market period. Indeed, coefficients of fund age in both regressions approximated -30 and the significance at the 1% level, implying that as funds age progress, the market- and risk- adjusted return tends to deteriorate. This interesting observation indicates that long-established funds usually employ managers with long working experience. In additional, Zeng,

[13] From appendix C, we can see the expense ratio is negatively correlated with total assets. Therefore, we re-examine regression excluding total assets, the expense ratio is also positively and strongly significant related to market benchmark adjusted returns, but no significant related to Jensen's alpha, see appendix D.

Zha, & Gong (2006) documented that the working experience of fund managers was negatively significant related to fund performance. One possible argument that those fund managers are afraid to lose their job when fund performance decreases dramatically, verifying that tend to remain their pervious conservative investment strategy that adopted in market depression period.

For expense ratio and turnover ratio, our results keep the same with previously documented that the coefficient of the expense ratio is negatively significant related to Jensen's Alphas. The coefficient of turnover ratio is positively significant related to market benchmark adjusted returns and Jensen's Alphas. Therefore, the impacts of the expense ratio and turnover ratio on fund performance remain the same under overall examination period as well as a bull market period. Moreover, the interesting finding is that team-manager is negatively significant related to market benchmark adjusted returns. The coefficient of team-manager is approximately -7, and the significance level at 1%. The possible argument is that team-manager under bull market period may prolong the decision making process since it will take longer time to reach an agreement.

In summary, only the impact of turnover ratios on the market- and risk-adjusted returns are consistent the same results under the bear- and bull-market period. In addition, our results indicate one interesting relationships regarding the impact of the expense ratio, it is positively related to market benchmark adjusted returns under bull market period, while a negative relationship between expense ratio and risk-adjusted returns under bull market period. Furthermore, only consider the market benchmark adjusted returns, we find an interesting investment strategy that buy a long-established fund with team-manager under bear market period, and sell it under bull market period to generate better performance.

Table 5.3 Fund characteristics and management attributes influencing on fund performance under the different market conditions

This table presents the fund characteristics and management attributes influencing on fund performance. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII-funds from 2006 to 2010. Funds less than 24 months are excluded from our sample. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. We adopt the OLS method to run the pooled cross-sectional regression. Model 1 includes expense ratio, while Model 2 presents turnover ratio instead of the expense ratio. The panel A and B present the same statistics under different market periods, which are bear- and bull- market periods respectively. Numbers in parentheses are t-statistics. *, ** and *** indicated significance at the 10%, 5% and 1% level, respectively.

Independent variable	Dependent variable			
	Market benchmark adjusted return		**Jensen's alpha**	
***Panel A: Bear market** (including 2008, 2010)*				
	Model 1	***Model 2***	***Model 1***	***Model 2***
LOGTA	.483 (.365)	**2.499** **(2.053)****	.659 (.456)	**2.657** **(1.922)***
LOGAGE	**8.848** **(2.802)*****	**11.846** **(3.949)*****	2.947 (.855)	5.000 (1.468)
EXPENSE R.	**2.825** **(3.034)*****		.836 (.822)	
TURNOVER R._1		**.090** **(6.659)*****		**.057** **(3.697)*****
MANAGEMENT STURCURE	1.737 (1.429)	**2.048** **(1.821)***	1.762 (1.328)	1.764 (1.380)
MANAGER EDUCATION	.051 (.040)	.845 (.700)	.708 (.506)	1.254 (.915)
Adjusted R^2	.062	.177	-.003	.048
F value	4.292	11.611	.859	3.496
No. of observations	249	249	249	249
***Panel B: Bull market period** (including 2006, 2007, 2009)*				
	Model 1	***Model 2***	***Model 1***	***Model 2***
LOGTA	**2.753** **(1.760)***	**4.014** **(2.609)****	**-6.156** **(-2.608)****	**-3.939** **(-1.662)***
LOGAGE	**-29.758** **(-4.986)*****	**-29.254** **(-5.022)*****	**-35.530** **(-3.946)*****	**-35.924** **(-4.002)*****
EXPENSE R.	-.991 (-1.477)		**-2.909** **(-2.875)*****	
TURNOVER R._1		**.028** **(3.432)*****		**.038** **(3.007)*****
MANAGEMENT STURCURE	**-7.207** **(-3.446)*****	**-6.346** **(-3.086)*****	**-7.962** **(-2.523)****	**-6.701** **(-2.114)****
MANAGER EDUCATION	-2.296 (-1.047)	-2.763 (-1.293)	-3.409 (-1.031)	-4.417 (-1.341)
Adjusted R^2	.171	.208	.136	.139
F value	9.473	11.819	7.427	7.648
No. of observations	207	207	207	207

6 Robustness tests

6.1 Robustness check for the Chinese open-end equity fund performance

To examine whether the result of Chinese open-end equity fund performance is robust, we re-estimate Market benchmark adjusted returns and Jensen's Alpha (in previous section 3.1 adopt formulas (2) and (3), respectively) using one alternative market index: R_{mt} = 45% * Shanghai Composite Index + 10% * Shanghai Government Bond Index + 45% Shenzhen Component Index. Table 6.1, for brevity, shows the results from the overall sample period in Panel A are largely consistent with our main result in Table 6.1. To further address the different market periods, as shown in Panel B and C, with regard of market benchmark adjusted returns, the results remain the same with our main findings that fund performance is better on average under bear market than under bull market.

Table 6.1 summary of the two estimated abnormal return over the period time

This table presents the summary of the two estimated abnormal annual return. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII- funds from 1st, Jan. 2006 to 31st, Dec. 2010. Panel A presents descriptive statistics for all 456 fund-year observations in the dataset during the full sample period. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. These two measurements are in a unit of % per annual. The panel B and C present the same statistics, however, under different market periods, which are bear- and bull- market periods, respectively.

	Mean	Median	Max.	Min.	S.D.
Panel A: whole sample	**456 annual ob. (From 2006-2010)**				
Market benchmark adjusted (p.a.) %	**5.89**	**8.71**	**69.10**	**-31.08**	**14.77**
Jensen's alpha (p.a.) %	**9.10**	**8.65**	**93.44**	**-28.79**	**14.99**
Panel B: Bear Market period	**249 annual ob. (including 2008, 2010)**				
Market benchmark adjusted (p.a.) %	**14.97**	**12.63**	**69.10**	**-15.95**	**9.89**
Jensen's alpha (p.a.) %	**8.37**	**9.86**	**52.45**	**-28.79**	**9.05**
Panel C: Bull Market period	**207 annual ob. (including 2006, 2007, 2009)**				
Market benchmark adjusted (p.a.) %	**-5.04**	**-5.41**	**36.61**	**-31.08**	**12.02**
Jensen's alpha (p.a.) %	**9.98**	**4.23**	**93.44**	**-24.40**	**19.91**

This table includes the mean, median, minimum, maximum, and standard deviation of abnormal return. The Jensen's alphas are estimated using the single CAPM with monthly return data from 1st, Jan. 2005 to 31st, Dec. 2010.

6.2 Robustness check for the impact of turnover ratio on fund performance

We perform alternative measures of turnover ratio to do the robustness check, whether this explanatory variable can still hold the same result with a prior documented. As previously mentioned, the outcomes demonstrated that turnover ratio is positively significant related to not only market benchmark adjusted returns but also Jensen's Alphas under overall sample period. Table 6.2 also shows the results of the impact of turnover ratio 2 on fund performance for all samples combined from 2006 to 2010. The result is remaining the same. The coefficient of turnover ratio is positively related to market benchmark adjusted returns as well as Jensen's Alphas, and the significance at the 1% level. This further supports that as turnover ratio increases, market-adjusted returns and Jensen's Alphas rise. Investors should therefore concern turnover ratio when investing in open-end equity mutual funds with actively-managed.

Table 6.2 the impact of turnover ratio on fund performance during the whole sample period

This table presents the fund characteristics and management attributes influencing on fund performance. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII-funds from 2006 to 2010. Funds less than 24 months are excluded from our sample. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. We adopt an OLS method to run the pooled cross-sectional regression. Model 3 presents turnover ratio _2 instead of the expense ratio. Numbers in parentheses are t-statistics. *, ** and *** indicated significance at the 10%, 5% and 1% level, respectively.

Independent variable	Dependent variable	
	Market benchmark adjusted return	**Jensen's alpha**
	Model 3	***Model 3***
LOGTA	1.700 (1.605)	-.193 (-.146)
LOGAGE	-2.469 (-.727)	**-7.770** **(-1.830)***
TURNOVER R._2	**.013** **(4.276)*****	**.023** **(6.079)*****
MANAGEMENT STURCURE	-.371 (-.294)	-1.208 (-.767)
MANAGER EDUCATION	-.189 (-.142)	-.1.074 (-.647)
Adjusted R^2	.034	.089
F value	4.201	9.867
No. of observations	456	456

7 Summary and conclusions

This thesis investigates the Chinese mutual fund industry. More specifically, we supply a general and extensive analysis of 157 open-end equity mutual funds with actively-managed by examining fund-specific characteristics and management attributes influencing on fund performance from 1st January, 2006 to 31st December, 2010. Through applying two measures of fund performance: the market benchmark adjusted return and Jensen's Alpha, the aim of this study is to recognize and confirm which specific factors are significantly related to fund performance. According to the pooled cross-sectional analysis with OLS regression in Section 5, it is of critical to be cautious when drawing conclusions from regression:

Hypothesis 1: on average, Chinese open-end equity funds have outperformance

According to the market benchmark adjusted returns and Jensen's Alphas, the majority of the Chinese open-end equity mutual funds have outperformance under overall sample period as well as under different market periods. See table 5.2, the medians of market benchmark adjusted returns and Jensen's alphas are positive, which indicate 8.52 % and 8.55 %, respectively. Our robust results show in line with the main findings that the Chinese open-end equity funds on average have outperformance. All in all, based on above two measures of fund performance, **our hypothesis 1 is supported.**

Hypothesis 2: on average, the performances of Chinese open-end equity mutual funds are outperformance under bear- as well as under bull-market period after risk adjusted.

See table 5.2, we get sufficient evidences from the empirical study to accept our hypothesis 2 during different market periods show that the performances of Chinese open-end equity mutual fund are outperformance under bear- as well as under bull-market period after risk-adjusted. The medians of Jensen's Alpha under bear- and bull- market period are both positive (9.86% and 4.23%, respectively). Therefore, **hypothesis 2 can be supported**.

Hypothesis 3: fund size is positively related to the mutual fund performance.

Our second hypothesis is confirmed based on the total fund asset as proxy fund size. Different measures of fund performance present different results. More specifically,

even though the impact of fund size is positively related to market benchmark adjusted return under bull market, but the significant level very weak. In addition, to Jensen's Alpha, the coefficient of fund size is negatively related to fund performance, and the significance level at 5% under overall examination period as well as a bull market period. Our results have no strong evidence to support our hypothesis 5. Therefore, **we should carefully not support hypothesis 5.**

Hypothesis 4: fund age is positively related on fund performance.

Earlier empirical studies performed to explore the impact of age on fund performance show diverged results. From our results, the fund age is negatively significance related to Jensen's Alpha under overall sample periods. Furthermore, the roles of age differ under different market periods. More specifically, the coefficient of age is only positively significant related to market benchmark adjusted returns under bear market period, while it is strongly and negatively significant related to market- and risk-adjusted return under bull market period. Consequently, **we should carefully not support hypothesis 4.**

Hypothesis5: fund expense ratio is negatively related to fund performance

Our results in line with some earlier studies showed that the coefficient of expense ratio is negatively significant related to fund performance. In particular, as regardless two measures of fund performance, the pooled cross-sectional analyses indicate the same outcome under overall examination period. The coefficients of expense ratio are strongly and negatively significant related to fund performance. Hence, **hypothesis 5 can be supported.**

Hypothesis 6: fund turnover ratio is positively related to fund performance.

We get sufficient evidences from the empirical study to support our hypothesis. As overall sample period and different market periods analyses, those results show that the turnover ratio is positively related to market benchmark adjusted returns and Jensen's Alphas, and the significance level at 1%. Furthermore, with respect to the result of robustness test the impact of turnover ratio is consistent with our main result. Consequently, **hypothesis 6 can be supported by our results**. A fund with high turnover ratio does perform statistically better.

Hypothesis 7: In fund's management structure, the fund with team-manager has positively related to mutual fund performance.

Based on this hypothesis, in general, it cannot be supported by our regression analysis. In particular, the result show that the team-manager has a negative impact on fund performance, but this effect is not found to be statistically significant. However, among all the columns, even though under the bull market period, the team-manager is negatively related to market benchmark adjusted return, and the significance level at 1%. Consequently, **hypothesis 7 is not supported carefully by our results.**

Hypothesis 8: fund manager with an MBA degree is positively related to fund performance.

With respect to managerial education, most interestingly for our discussion, our result show that there is no significant relationship between fund manager who hold MBAs degree and fund performance no matter which model and measures of fund performance. In general, **hypothesis 8 cannot be supported.**

To simplify reading, the results from the previous hypotheses discussion are summarized into answer our two main research questions.

In terms of investment returns, how has open-end equity funds with actively-managed in China performed?

To analyze the Chinese equity mutual fund performance, it plays a critical role to consider the market- and risk-adjusted returns. If failing to discuss the market- and risk-adjusted return, only considering the raw return itself will exposures results bias. According to first two hypotheses, our results show that the Chinese open-end equity funds on average are outperformance. More specifically, the medians of market benchmark adjusted returns and Jensen's Alphas are 8.52% and 8.55%, respectively. According to our robustness test using an alternative market index, our evidence again indicates that the returns of the Chinese open-end equity fund are positive during the overall examination period. This implies that the majority of funds can beat the markets.

How do fund-specific characteristics and managerial attributes influence the performance (return) of China's equity mutual fund?

Following the discussion of the fund characteristics and managerial attributes on influencing the Chinese equity fund performance, our results are of major importance to be cautious when the suggestion for individual investors who tend to invest actively-managed funds. According to previous section, even though some of the applied explanatory variables are revealed to be statistically significant, the impact of turnover ratios and expense ratios play much more critical role influencing on fund performance than other explanatory variables.

Additionally, when individual investors decide on a general investment objective, there are a series of investment strategies derived from our results.

- Firstly, the expected open-end equity fund performance can be enhanced by selecting those funds that rank highly on turnover ratio, but lowly on expense ratio in general.
- Secondly, the evidence of our thesis suggests that investors should also consider a small total assets and young fund in general.
- Thirdly, One more interesting finding that individual investors can carry on investment strategies that buy long-established fund with team-manager under bear market period, and sell it under bull market period will generate superior profit.
- Contrary to popular belief, finally, our results present that the managers who hold MBAs degree are not generally significant impact on market benchmark returns as well as risk-adjusted returns.

8 Limitation

It is definitely that our investigation suffers from some limitations, in spite of this thesis does supply some functional and meaningful information for investors. Following, we will carry out some limitations that exist in our study:

Firstly, the research period in our thesis is relatively shorter than some study in developed market. Only used five-year period examines the impact of fund characteristics and management attributes on fund performance.

Secondly, the majority of data is not only difficult to access but also time-consuming to collect. Therefore, some explanatory variables and more frequently data cannot be examined, such as a weekly raw return, manager tenure, diversification level.

Finally, the methodology also exists some limitations. One major consider with the pooled cross-sectional study among the fund-year observations that the errors tend to be correlated across over time.

9 Future research

Based on reviewing a lot of interesting papers, there are several interesting and creative topics for future research. As follows, we list some interesting topics:

Firstly, we can extend our research on educational level, because it contains a lot of factors, such as study subjects, certificate, degree, and so on. From examining those factors, we can clearly understand which educational factors will influence on the performance of an equity mutual fund.

Secondly, the study on the persistency of equity mutual fund performance is relatively small in the Chinese mutual fund industry. However, we can find many studies in developed markets. From this investigation, we may know that the persistency of the Chinese equity mutual fund remain long- or short-term, and also which fund-specific characteristics will contribute to the persistency of mutual fund performance.

Finally, the performance-flow relationship (PFR) is concerned a lot in the mutual fund management mechanism. As we all know, the majority revenue of mutual fund comes from management fees from their fund holders. Thus, the larger scale of net asset value the fund has, the more revenue they get. More interestingly, from open-end fund perspective, the scale of the fund can be ever-changing due to the investor can redeem or reinvest. Based on this situation, if the cash flow has a positive significant relation to fund performance, the fund managers will have incentive to enlarge their fund size, thus improve the fund invest profitable.

10 References

Babalos, V., Kostakis, A., & Philippas, N. (2009). Managing mutual funds or managing expense ratios? Evidence from the Greek fund industry. *Journal of Multinational Financial Management, 19*, 256-272.

Baks, K., Metrick, A., & Wachter, J. (2001). Should Investors Avoid All Actively Managed Mutual Funds? A Study in Bayesian Performance Evaluation. *The Journal of Finance, 56*(1), 45-85.

Barber, B., Odean, T., & Zheng, L. (2005). Out of sight, out of mind: the effect of expenses on mutual fund flows. *Journal of Business, 79*, 2095-2120.

Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance, 29*, 1751–1767.

Benos, E., & Jochec, M. (2011). Short term persistence in mutual fund market timing and stock selection abilities. *Annals of Finance, 7*(2), 221-246.

Berk, J., & Green, R. (2004). Mutual fund flows and performance in rational markets. *Journal of Political Economy, 112*, 1269-1295.

Bertin, W., & Prather, L. (2008). The influence of management structure on the performance of fund of funds. *Paper presented at the 2008 FMA European Conference*.

Bhojraj, S., Cho, Y., & Yehuda, N. (2010). Mutual fund size, fund family size and mutual fund performance: The role of selective disclosure and regulation FD. *Johnson School Research Paper Series No. 11-2010*.

Białkowski, J., & Otten, R. (2011). Emerging market mutual fund performance:Evidence for Poland. *North American Journal of Economics and Finance, 22*, 118–130.

Bikhchandani, S., Hirshleifer, D., & Welch, I. (1998). Learning from the behavior of others: conformity, fads, and informational cascades. *Journal of Economic Perspectives, 12*, 151–170.

Brown, S., & Goetzmann, W. (1995). Performance Persistence. *The Journal of Finance, 50*(2), 679-698.

Brown, S., Goetzmann, W., Ibbotson, R., & Ross, S. (1992). Survivorship Bias in Performance Studies. *The Review of Financial Studies, 5*(4), 553-580.

Bryant, L., & Liu, H.-C. (2011). Mutual fund industry management structure, risk and the impacts to shareholders. *Global Finance Journal, 22*, 101-115.

Cao, S., Huang, H., & Zhang, X. (2011). The domestic open-ended funds' performance persistence and the holders' choice. *China financial research network*.

Carhart, M. (1997). On Persistence in Mutual Fund Performance. *The Journal of Finance, 52*(1), 57-82.

Chen, J., Hong, H., Huang, M., & Kubik, J. (2004). Does fund size erode mutual fund performance? The role of liquidity and organization. *The American Economic Review, 94*(5), 1276-1302.

Chevalier, J., & Ellison, G. (1999). Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance, 54*(3), 875-899.

Dellva, W., & Olson, G. (1998). The relationship between mutual fund fees and expenses and their effects on performance. *Financial Review, 33*(1), 85–104.

Droms, W., & Walker, D. (1996). Mutual fund investment performance. *The Quarterly Review of Economics and Finance, 36*(3), 347-363.

Du, D., Huang, Z., & Blanchfield, P. (2009). Do fixed income mutual fund managers have managerial skills? *The Quarterly Review of Economics and Finance, 49*, 378-397.

Edelen , R., Evans , R., & Kadlec , G. (2007). Scale Effects in Mutual Fund Performance: The Role of Trading Costs. *working papers series*.

Edelen, R., & Warner, J. (2001). Aggregate price effects of institutional trading:a study of mutual fund flow and market returns. *Journal of Financial Economics, 59*, 195-220.

Elton, E., Gruber, M., & Blake, C. (1996). The Persistence of Risk-Adjusted Mutual Fund Performance. *The Journal of Business, 69*(2), 133-157.

Fama, E., & French, K. (1993). Commonriskfactors in the returns on stocks and bonds. *Journal of Financial Economics, 33*(1), 3-56.

Ferreira, M., Keswani, A., Miguel, A., & Ramos, S. (2012). The flow-performance relationship around the world. *Journal of Banking and Finance, 36*(6), 1759-1780.

Ferson, W., & Schadt, R. (1996). Measuring Fund Strategy and Performance in Changing Economic Conditions. *The Journal of Finance, 51*(2), 425-461.

France-Presse, A. (2008, Jan. 3). *China Mutual Fund Industry Nearly Quadruples in 2007*. Retrieved Oct. 15, 2012, from Industryweek: http://www.industryweek.com/articles/china_mutual_fund_industry_nearly_quadruples_in_2007_15562.aspx

Goetzmann, W., & Ibbotson, R. (1994). Do winners repeat? Patterns in mutual fund performance. *The Journal of Portfolio Management, 20*(2), 9-18.

Golec, J. (1996). The Effects of Mutual Fund Managers' Characteristics on Their Portfolio Performance, Risk and Fees. *Financial services Review, 5*(2), 133-148.

Gottesman , A., & Morey , M. (2007). Predicting emerging market mutual fund performance. *Journal of Investing, 16*, 111-122.

Gottesman, A., & Morey, M. (2006). Manager education and mutual fund performance. *Journal of Empirical Finance, 13*, 145-182.

Grinblatt, M., & Titman, S. (1992). The Persistence of Mutual Fund Performance. *The Persistence of Mutual Fund Performance, 47*(5), 1977-1984.

Guercio, D., & Tkac, P. (2002). The Determinants of the Flow of Funds of Managed Portfolios: Mutual Funds vs.Pension Funds. *Journal of Financial and Quantitative Analysis, 37*(4), 523-557.

Hamidani, F. (2000). *Mutual fund performance in bull and bear markets: an empirical examination.* Canada: Simon Fraser University.

Han, Y., Noe, T., & Rebello, M. (2008). Horses for Courses: Fund Managers and Organizational Structures. *Available at SSRN: http://ssrn.com/abstract=1100676 or http://dx.doi.org/10.2139/ssrn.1100676*.

Haslem, J. A., Baker, K. H., & Smith, D. M. (2008). Performance and characteristics of actively managed retail equity mutual funds with diverse expense ratios. *Financial Services Review, 17*, 49-68.

He, X., & Hao, Y. (2008). The persistence of open-end mutual fund performance. *Economic Theory and Business Management, 5*, 46-50.

Henriksson, R., & Merton, R. (1981). On Market Timing and Investment Performance. Part II. Statistical Procedures for Evaluating Forecasting Skills. *Journal of Buiness, 4*(54), 513-533.

Hsiao, C. (2003). *Analysis of Panel Data* (Second Edition ed.). Cambridge University Press.

Hsu, L.-C., Ou, S.-L., & Yang, C.-C. (2012). How to Choose Mutual Funds that Perform Well? Evidence from Taiwan. *International Journal of Economics and Finance, 4*(1), 247-259.

Huij, J., & Post, T. (2011). On the performance of emerging market equity mutual funds. *Emerging Markets Review, 12*, 238-249.

Huij, J., & Verbeek, M. (2007). Cross-sectional learning and short-run persistence in mutual fund performance. *Journal of Banking & Finance, 31*, 973–997.

Investment Company Institute;. (2011). *2011 Investment Company Fact Book* (51st Edition ed. ed.).

Javier , G.-B., & Pablo , R.-V. (2008). When cheaper is better: Fee determination in the market for equity mutual funds. *Journal of Economic Behavior & Organization, 67*(3), 871-885.

Javier, V.-G. (2013). The persistence of European mutual fund performance. *Research in International Business and Finance, 28*, 45– 67.

Jin, H., & Wu, S. (2007). A study on differences of performance between bull market and bear market for open-end funds in China. *首都经济贸易大学学报*, 57-61.

Kacperczyk, M., Sialm, C., & Zheng, L. (2005). On the Industry Concentration of Actively Managed Equity Mutual Funds. *The Journal of Finance, 60*(4), 1983-2011.

Karagiannidis, I. (2010). Management team structure and mutual fund performance. *Journal of International Financial Markets, Institutions and Money, 20*(2), 197–211.

Kosowski, R., Timmermann, A., Wermers, R., & White, H. (2006). Can Mutual Fund "Stars" Really Pick Stocks? New Evidence from a Bootstrap Analysis. *The Journal of Finance, 61*(6), 2551-2595.

Lai, M.-M., & Lau, S.-H. (2010). Evaluating mutual fund performance in an emerging Asian economy: The Malaysian experience. *Journal of Asian Economics, 21*, 378–390.

Lai, S. (2010). *Study on performance comprehensive evaluation of stock-based open-end funds.* Chengdu, Sichuan, China: Southwestern Universtiy of Finance and Economics.

Lhabitant, F., & Learned, M. (2002). Hedge Fund Diversification: How Much is Enough? *Journal of Alternative Investments, 5*, 23-49.

Liu, C. (2009). *Analysis of fund investment style, fund performance and the characteristics of fund manager.* Dalian: Dongbei University of Finance and Economics.

Moskowitz, T. (2000). Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style,Transactions Costs, and Expenses: Discussion. *The Journal of Finance, 55*(4), 1695-1703.

Moutinho, L., & Hutcheson, G. (2011). *The SAGE Dictionary of Quantitative Management Research.* SAGE Publication Ltd.

Otten, R., & Bams, D. (2002). European Mutual Fund Performance. *European Financial Management, 8*(1), 75-101.

Otten, R., & Bams, D. (2004). How to measure mutual fund performance: economic versus statistical relevance. *Accounting & Finance, 44*(2), 203-222.

Pastor, L., & Stambaugh, R. (2002). Mutual fund performance and seemingly unrelated assets. *Journal of Financial Economics, 63*, 315–349.

Peterson, J., Petranico, P., Riepe, M., & Xu, F. (2001). Explaining the Performance of Domestic Equity Mutual Funds. *The Journal of Investing, 10*(3), 81-91.

Prather, L., & Middleton, K. (2006). Timing and selectivity of mutual fund managers: An empirical test of the behavioral decision-making theory. *Journal of Empirical Finance, 13*, 249-273.

Prather, L., Bertin, W., & Henker, T. (2004). Mutual fund characteristics, managerial attributes, and fund performance. *Review of Financial Economics, 13*(4), 305-326.

Rakowski, D., & Wang, X. (2009). The dynamics of short-term mutual fund flows and returns: A time-series and cross-sectional investigation. *Journal of Banking & Finance, 33*, 2102–2109.

Santini, D., & Aber, J. (1998). Determinants of net new money flows to the equity mutual fund industry. *Journal of Economics and Business, 50*(5), 419-429.

Sharpe, W. (1966). Mutual Fund Performance. *The Journal of Business, 39*(1), 119-138.

Shukla, R. (2004). The value of active portfolio management. *Journal of Economics and Business, 56*(4), 331-346.

Sirri, E., & Tufano, P. (1998). Costly Search and Mutual Fund Flows. *The Journal of Finance, 53*(5), 1589–1622.

Swinkels, L., & Rzezniczak, P. (2009). Performance evaluation of Polish mutual fund managers. *International Journal of Emerging Markets, 4*(1), 26-42.

Tang, K., Wang, W., & Xu, R. (2012). Size and performance of Chinese mutual funds: The role of economy of scale and liquidity. *Pacific-Basin Finance Journal, 20*, 228-246.

Treynor, J., & Mazuy , K. (1966). Can mutual funds outguess the market. *Harvard Business Review, 44*, 1-36.

Wang, T. (2012, 10 19). *Actively- or passively- managed, which fund is better?* Retrieved 11 12, 2012, from Chinafund: http://www.chinafund.com.cn/article/201210/201210_221856.html

Wermers , R. (2000). Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style, Transactions Costs, and Expenses. *Journal of Finance, 55*(4), 1655-1703.

Yu, P., Li, Z., & Wang, Y. (2009). Can the institutional investors outperform the individual investors? *Journal of Financial Research*, 147–157.

Zeng, D., Zha, Q., & Gong, H. (2006). The fund-specific characteristics and managerial attributes influencing fund performance. *Chinese Journal of Management, 3*(3), 347-353

11 Appendices

A: Mutual fund performance measures

There are many alternatives to evaluate the mutual funds' performance. We will introduce some the most common measurements: Average Abnormal Return, Sharpe Ratio, Treynor Ratio, Jensen's Alpha, Fama-French 3-factor Alpha and Carhart's 4-factor Alpha.

1. **Average Abnormal Return:** this return is calculated by subtracting the risk free-rate or market benchmarks return. From this equation;

$$AR_p = \frac{1}{n}\sum_{t=1}^{n}(r_{pt} - r_{mt})$$

Where: AR_p indicates the average abnormal return; $r_{pt}$is the return of mutual fund in t period; $r_m$is the market benchmark return in t period.

2. **Sharpe Ratio:** also known as the Sharpe index, which was defined by William Sharpe in 1966. It measures the excess return per unit of deviation in an investment asset. The equation indicates as follows:

$$SR_p = \frac{\bar{r_p} - \bar{r_f}}{\sigma_p}$$

Where: SR_p is the Sharpe ratio of fund p; $\bar{r_p}$ is the average return of fund p; r_f is average risk-free rate; σ_p is the standard deviation of this expected excess return. A fund with a higher Sharpe ratio indicates better performance under the same risk.

3. **Treynor Ratio:** also known as Treynor index, is used to measure the return earned on the excess the risk-free rate to the systematic risk. The formula:

$$T = \frac{r_p - r_f}{\beta_p}$$

Where: T is Treynor ratio; r_i is the return of p; r_f is risk-free rate; β_p is the p's beta. The higher the Treynor ratio is, the better the performance of the mutual fund.

4. **Jensen's Alpha:** is based on the Capital Asset Pricing Model (CAPM). This is a way to determine the abnormal return that we can know the returns of

actively-managed funds are under- or over market returns. The formula indicates as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_m(R_{mt} - R_{ft}) + \varepsilon$$

Where R_{it} : is t period mutual fund I's return; R_{ft} the risk free rate; R_{mt}: is t period market return; α_i : is Jensen's alpha, the performance measure; β_m :is beta as systematic risk. When Jensen's alpha is positive, the fund has beaten market, vice versa.

5. **Fama-French's 3-factor alpha:** this is a model built by Fama & French (1993) to describe the risk-adjusted performance benchmark. They added two factors (SMB, and HML) into the single factor CAPM to measure the abnormal return of a portfolio as a whole.

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_1(R_{m,t} - R_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon$$

Where: $R_{i,t}$ is the return on fund I in period t; $R_{f,t}$ is the risk free rate in period t; $R_{m,t}$ is t period market return; SMB is the return generated by buying small size stocks and selling big size stocks (small minus big); HML_t Is the return generated by buying stocks with high book-to-market ratios and selling stocks with a low book-to-market ratios (high minus low); and the intercept of this regression α_i is used to measure the fund performance.

6. **Carhart's 4-factor alpha:** Carhart extended the Fama-French 3-factor model by adding a fourth factor (Momentum anomaly factor). This model also consistent with a CPAM. The detail equation indicates as follows;

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_1(R_{m,t} - R_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon$$

Where: $R_{i,t}$ is the return on fund I in period t; $R_{f,t}$ is the risk free rate in period t; $R_{m,t}$ is t period market return; SMB is the return generated by buying small size stocks and selling big size stocks (small minus big); HML_t is the return generated by buying stocks with high book-to-market ratios and selling stocks with low book-to-market ratios (high minus low); MOM_t is the difference in return between a portfolio of past winners and pass losers at time t; and the intercept of this regression α_i is used to measure the fund performance.

B: Fund performance characteristics

As noted in the previous literature review, there were several factors that influenced fund performance. Some concept of those characteristic variables will be introduced in order to easily understand. the common variables may be indicated fund size, fund age, expense ratio, and turnover ratio. A fund size can be measured by total fund assets, market capitalization and net asset value (NAV) of a fund. The number of years that a fund has been founded can be calculated as age of the fund. The expense of fund that include administration fee, management fee, custody costs, 12b-1 marketing Fees, legal expense, and transfer agent fees. A total expense ratio represents the percentage of fund assets paid to operate a mutual fund. Loads , usually are not included in the expense ratio, are sales or purchase charge. It has two kinds of load: Front-end load (fee paid when shares are purchased) and Back-end load (fee paid when share are sold). The turnover ratio of a mutual fund is a measurement that represents the trading activity of a fund related to the average amount of stock.

C: Multicollinearity under different market periods

Correlation matrix of independent variables under bear market period

	1	2	3	4	5	6	7
1 Fund age*	1	-.131	-.109	-.212	-.197	.028	-.038
2 Total assets*		1	**-.537**	**-.522**	**-.518**	.067	-.069
3 Expense ratio			1	**.396**	**.380**	.093	.041
4 Turnover ratio 1				1	**.968**	-.030	-.052
5 Turnover ratio 2					1	-.041	-.058
6 Management Structure						1	.228
7 Management education							1

Pearson correlation coefficients for fund-specific characteristic and management attributes are analyzed in 2008 and 2010. Some variables with an asterisk (*) are calculated in logarithmic. Further, independent variables are marked boldface, which indicated high correlation coefficients.

As a result of the majority of variable correlation coefficients are below 0.30, which is consistent with our main multicollinearity test. One correlation is noteworthy that the total assets are negatively correlated with expense ratio and two kinds of turnover ratio under bear market period.

Correlation matrix of independent variables under bull market period

	1	2	3	4	5	6	7
1 Fund age*	1	-.143	.090	-.032	-.073	-.037	-.105
2 Total assets*		1	-.150	-.178	-.169	.090	.058
3 Expense ratio			1	**.727**	**.676**	-.021	.054
4 Turnover ratio 1				1	**.974**	-.121	.004
5 Turnover ratio 2					1	-.129	.004
6 Management Structure						1	.201
7 Management education							1

Pearson correlation coefficients for fund-specific characteristic and management attributes are analyzed in 2006, 2007 and 2009. Some variables with an asterisk (*) are calculated in logarithmic. Further, independent variables are marked boldface, which indicated high correlation coefficients.

As a result of the majority of variable correlation coefficients are below 0.30, the issue of multicollinearity presents not serious. Only the expense ratio is positively correlated with two turnover ratios. This result is consistent with our main multicollinearity test.

D: Fund characteristics and management attributes influencing on fund performance under bear market condition

Fund characteristics and management attributes influencing on fund performance under different market periods

This table presents the fund characteristics and management attributes influencing on fund performance. The sample includes all Chinese open-end equity mutual funds with actively managed by excluding index-, QDII-funds under bear market condition (including 2008 and 2010). Funds less than 24 months are excluded from our sample. Market benchmark adjusted return and Jensen's alpha are the two measures of fund performance. We adopt the OLS method to run the pooled cross-sectional regression. Numbers in parentheses are t-statistics. *, ** and *** indicated significance at the 10%, 5% and 1% level, respectively.

Independent variable	Dependent variable					
	Market benchmark adjusted return			**Jensen's alpha**		
	Model 1	***Model 2***	***Model 3***	***Model 1***	***Model 2***	***Model 3***
LOGTA	-1.690 (-1.494)			.016 (.013)		
LOGAGE	**8.361** **(2.608)*** **	**8.938** **(2.845)*** **	**11.946** **(3.957)*** **	2.804 (.815)	3.071 (.895)	5.107 (1.491)
EXPENSE R.		**2.641** **(3.379)*** **			.585 (.685)	
TURNOVER R._1			**.075** **(6.496)*** **			**.041** **(3.141)*** **
MANAGEMENT STURCURE	**2.319** **(1.900)***	1.804 (1.505)	**2.252** **(1.997)** **	1.934 (1.477)	1.854 (1.416)	1.980 (1.548)
MANAGER EDUCATION	-.083 (-.063)	.010 (.008)	.525 (.436)	.669 (.479)	.653 (.469)	.914 (.668)
Adjusted R^2	.031	.066	.166	-.002	.000	.037
F value	2.964	5.350	13.347	.907	1.026	3.409
No. of observations	249	249	249	249	249	249