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Abstract

Purpose – The purpose of this paper is to examine the performance of Chinese mutual funds during the period of January 2000 to July 2013. Emerging market funds provide investors with alternative risk exposure for their portfolios. The Chinese market has developed rapidly and differs from developed markets regarding wide range of market and economic characteristics, including size, liquidity, and regulation. The performance of these funds is investigated by using various risk adjusted measures. The study also compares performances of mutual fund subgroups and explains the factors influencing their performances.

Design/methodology/approach – This is an empirical paper using various risk performance measures. These measures include the Sharpe ratio, Information ratio, Treynor ratio, *M*-squared and Jensen's α. The data comprises 1,037 funds. These funds are further divided into ten subgroup of funds based on their classification: equity (484); aggressive allocation (95 funds); conservative allocation (18 funds); moderate allocation (85 funds); aggressive bond (92 funds); normal bond (52 funds); guaranteed (29 funds); money market (53 funds); and QDII funds (119 funds). A cross-sectional analysis of fund performance is performed using Sharpe and Jensen's measures as dependent variables and fund-specific variables (*Age*, *Turnover*, *Tenure*, *Frontload*, *Redemption fees*, and *Management fees*), market-specific variables (*P/E ratio*, *P/B ratio*, *Market capitalization*), and fund types as independent variables.

Findings – The findings show that Chinese funds generate positive αs for their investors. The highest return is provided with aggressive allocation funds followed by moderately aggressive allocation funds. The average Jensen's α is the highest in aggressive allocation funds. QDII funds do not provide significant positive αs; in several instances αs are negative. Further analysis of sub-periods show that Chinese funds do not consistently provide excess returns and show great variations. The study also finds that older funds, funds with higher fees, high price to book ratio, and smaller funds continue to perform better than other funds.

Originality/value – This study adds value by focussing on Chinese funds and risk/return characteristics of these funds. The research will further explore factors explaining these returns.

Keywords China, Mutual funds, Emerging markets, α

Paper type Research paper

Introduction

The number of mutual funds in China has grown substantially during the last decade. Because of increased interest in emerging market investments, investment companies have created various funds to meet the needs of investors. According to Investment Company Institute, net cash flows to global equity funds increased from $2 billion in 2000 to $28 billion in 2013.The popularity of these investment vehicles come from both the diversification potential and the impressive performance that they have provided investors since their inception (Polwitoon and Tawatnuntachai, 2006, 2008). Since the investing environments in emerging markets differ considerably from developed markets, these differences would provide an opportunity for fund managers to get excess returns. For example, MSCI Emerging market index outperformed the advanced market indices for the last ten years. The higher volatility in these markets creates additional risk that investors should consider in their investment analysis.

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Whether active portfolio management can produce positive αs has received attention from both practitioners and academicians. The proponents in a manager's ability to generate positive αs believe managers represent disequilibrium returns that can exist in complex financial markets. For example, Jarrow (2010) argues that persistent and frequent arbitrage opportunities are rare, even in complex markets and therefore positive αs are more fantasy than fact. Roll (1992) shows such portfolios are suboptimal and risky because they do not belong to the mean-variance frontier. Alexander and Baptista (2010) propose a method to lessen the sub-optimality that involves forming a portfolio with minimum tracking error variance. As persistent and frequent arbitrage opportunities are much rarer, even in complex markets, Chinese equity, and bond mutual funds provide an alternative to US investors who want to expose their portfolios to this market. These funds offer a convenient way of getting high returns while diversifying risk.

This study analyses 1,037 Chinese mutual funds during the period of January 2000 to July 2013. The study contributes to literature in the following ways. First, it provides evidence on Chinese fund performance during the time when emerging markets are attracting investors. Second, it examines performance of subgroups based on fund types. It then also provides evidence on fund managers' ability to provide positive αs for investors. There is a limited number of studies investigating these issues. Finally, the study researches the factors explaining Chinese fund performances. Findings show Chinese fund managers experience some success in their search for significant positive αs for their portfolios during this period. Although no statistically significant differences are detected among Chinese funds returns and benchmark index returns used in this study, mutual funds' risk adjusted returns are slightly higher than risk adjusted return measures of various relevant indices. When the mutual fund sample is divided into bonds and equity mutual funds, bond funds have significantly better risk adjusted measures than stock funds.

Using Sharpe ratio and Jensen's α as dependent variables, results from a cross-sectional analysis show that older funds, funds with higher fees, funds with high price to book ratio, and smaller funds outperform others.

Literature review

Many earlier studies investigate the performances of international mutual funds in aggregate. Among them, Cumby and Glen (1990) and Eun *et al.* (1991) report that these funds have allowed US investors to diversify risk. While most of these funds outperform domestic benchmarks, they underperform global indices. For example, Chen and Jang (1994) examine 15 US-based international mutual funds' performance regarding manager selection and timing abilities. Findings show that most of the internationally diversified mutual funds outperform the domestic stock market index in both selectivity and timing. Regarding World Market Index, the authors report weak evidence of stock selection ability for those fund managers. In a similar study, Kao *et al.* (1998) also show that international fund managers are poor market-timers. Managers of certain funds, including those of Pacific, Foreign, and World funds have good selectivity performance. Contrary to these studies, Droms and Walker (1994) find no significant excess returns for international equity funds. Investment returns are not related to load status, asset size, expense ratios, and turnover rates. Using 28 global equity funds, Shukla and Singh (1997) find that the global equity funds are superior performers relative to a global benchmark. They perform poorly relative to domestic US equity funds. Droms and Walker (2001) examine performance persistence in international equity mutual funds from 1977 to 1996.

They conclude that international equity mutual funds exhibit strong performance persistence in the short-term, but persistence disappears after the first year. Fortin and Michelson (2005) examine the benefits of active international fund management by using 831 funds in various categories. Their findings show that except for European funds, all fund categories underperform the market. They find no significant relationship between total return and expense ratio but a positive relationship between total return and both fund size and turnover.

Latif and Kazemi (2007) use a stochastic model to examine US-based international mutual funds during the 1990-2003 period. Sample funds are classified based on regions (such as Europe, Pacific, and World). Results show that global equity markets are well integrated. Fund managers cannot consistently earn excess returns above a buy and hold strategy in the US-equity market. Arugaslan *et al.* (2008) examine risk adjusted performance of the largest 50 US-based international equity funds using the *M*-squared performance measure. The authors argue that the *M*-squared approach is easily comprehensible to an average investor. They further note that funds with higher returns may lose their attractiveness to investors once the risks are considered. More recently, Lin *et al.* (2009) argue that having a global view adds flexibility to the asset allocation process as fund managers can shift their investments between US and non-US stocks. With skilled managers, a higher α is achievable without adding more risk. Fan and Addams (2012) also find that international funds outperform the stock market indices and managers who trade less often have better performance than managers who trade more often. The authors further report that larger funds outperform smaller counterparts.

Other studies focus on regions and countries. Among them, Pushner *et al.* (2001) examine 57 US-based European mutual funds and report that these funds do not consistently outperform European equity markets. In a follow up study, using 26 Latin-American equity funds, Rainish and Pushner (2002) find that US. affiliated fund managers consistently outperform Latin-American equity markets.

Gottesman and Morey (2007) examine the performances of diversified emerging market mutual funds by using 54, 83, and 74 funds for the years 1997, 2000, and 2002. They examine various fund characteristics including expense ratio, portfolio turnover, and manager's tenure on fund performance. Findings show that lower expense ratio funds are associated with higher fund performance. Michelson *et al.* (2008) find that emerging market funds outperform both the MSCI Index and the S&P 500 index, but not the emerging market index during 1999-2005. They further report a negative relationship between emerging market fund returns and turnover, and a positive relationship between fund returns and fund size.

A few studies examine the mutual fund performance within different countries. For example, Lin (2006) examines Japanese broad-market equity fund manager performance. Findings show that these managers outperform index returns during the period of 1981 to 2004. The findings further suggest that these managers should underweight large-cap stocks and financial companies and take less market risk. Low (2007) examines selectivity and timing performance of Malaysian fund managers using two local benchmarks. Findings show that funds display negative performance regardless of the benchmarks used. There is also no variation in the manager's market timing and selective performance across alternative market benchmarks. Hribernik and Vek (2011) perform similar analysis using Slovenian mutual funds during 2005-2009. Regarding selectivity and market timing, the majority of fund managers were not successful. Using a sample of 159 Chinese equity funds from 2003 to 2008, Li and Lin (2011) find both value-weighted and equally weighted Chinese equity fund portfolios provide higher

Sharpe ratios than their benchmark. They further document that using Jensen's α and Fama-French three-factor model α, the benefits largely disappear. Larger Chinese equity funds also outperform the mid and small funds during the study period.

Aside from equity mutual funds, there are a few studies examining bond mutual funds. Gallo *et al.* (1997) use the monthly returns of 22 US-based international bond mutual funds from 1988 to 1994 and report these funds perform better than the Salomon Brothers Non-US-Dollar World Government Bond Index. The excess returns measured with the multi-index models are similar to those measured with the single-index model. The authors find that portfolios comprising all funds outperform the multi-index benchmark while five of the funds outperform the benchmark individually. When comparing the results of the two models, the authors find the multi-index model is better at explaining returns. Polwitoon and Tawatnuntachai (2006, 2008) analyze emerging market bond funds during 1996-2005 and report that these funds outperform both domestic bonds and global bonds funds. The authors argue that these bonds further provide international diversification benefits to both US and international bond and equity portfolios.

Overall, the literature on the performances of international equity and bond funds reports mixed results with most studies outlining the benefit of international diversification. This paper provides a comprehensive analysis of Chinese fund performance and factors influencing fund performance.

Data and methodology

Data

Chinese funds and corresponding benchmark indices are obtained from Morningstar between January 2000 and July 2013. The initial sample of Chinese funds included 1,586 funds. Table I outlines the sample selection process. Funds without minimum required

Subgroups of funds	Initial sample	Less: insufficient data	Less: multiple fund class	Net sample	% of total
Equity					
Equity funds	581	79	18	484	46.7
Aggressive allocation	104	9	0	95	9.2
Conservative allocation	35	11	6	18	1.7
Moderate allocation	96	11	0	85	8.2
Bonds					
Aggressive bond	184	35	57	92	8.9
Normal bond	166	86	28	52	5.0
Short-term bond	105	88	7	10	1.0
Others					
Guaranteed	50	21	0	29	2.8
Money market	131	45	33	53	5.1
QDII	134	15	0	119	11.5
Total	1,586	400	149	1,037	100.0

Note: This table reports the sample selection of Chinese funds during the period of January 2000 and July 2013

Table I.
Sample selection

data of 12 months are eliminated (400 funds). Then funds with multiple fund classes are also removed from the sample (149 funds). The same class funds were selected for funds with the multiple classes. Almost all eliminated funds were bond and money market funds. The net sample comprises of 1,037 funds. These funds are further divided into ten subgroups of funds based on their classification: aggressive allocation (95 funds), aggressive bond (92 funds), conservative allocation (18 funds), equity (484), guaranteed (29 funds), moderate allocation (85 funds), money market (53 funds), normal bond (52 funds), short-term bond (10 funds), and QDII funds (119 funds).

Table II provides descriptive statistics for the entire sample and five benchmark indices used in the analysis. Monthly mean returns for Chinese funds are 0.453 percent with a standard deviation of 0.847. Table II also provides skewness, kurtosis, and Jarque-Bera statistics. Monthly mean returns distribution is skewed to the left or negatively skewed (−1.3851) – this shows that the distribution is less than the median. This signifies that the series or portfolio has a tendency to earn a return less than that of the mean. The data has a positive kurtosis (12.968), a peaked distribution compared with a normal distribution. This suggests that fund returns cluster closer to the mean value than they would if they were normally distributed.

Table II further reports the statistical properties of various benchmark indices used in the study. These include MSCI AC Far East Index, JPM EMBI Global Index, IA SBBI US1 Year Trsy Index, Barclays US Govt 1-3 Year Index, and the S&P 500 Index. The highest mean return is provided by JPM EMBA Global index (0.765 percent), while IA ABBI US 1 Year Trs (0.264) has the lowest returns. From mean returns, Chinese funds appear to experience higher returns than most of the benchmarks. The statistical analysis of differences in mean of Chinese funds and these five indices show that there is no statistically significant differences among them (with *F*-value of 1.58). Pairwise test of differences between Chinese fund and each of these indices show no significant difference between returns of Chinese fund and MSCI AC Far East, JPM EMBI Global Bond, and S&P500 returns. Statistically significant differences are noted for IA SBBI US 1 Year Trsy and Barclays US Govt 1-3 Year returns (*t*-value of 3.67 and 3.29). These preliminary statistics show no evidence of higher performance for Chinese funds. The following section outlines methodologies that consider risk adjusted performance measures.

Methodology

Several risk adjusted performance measures are used. First, the Sharpe reward to risk measure was estimated using Equation (1) below. This provides a relative gauge for fund performance comparison. Thus, if portfolios are similar, a larger Sharpe ratio

	Chinese funds	MSCI AC far East	JPM EMBI global	IA SBBI US 1 Year Trsy	Barclays US Govt 1-3 Year	S&P 500
Mean	0.453	0.225	0.765	0.179	0.264	0.366
SD	0.847	5.014	2.739	0.250	0.444	4.452
Skewness	−1.385	−0.398	−1.339	1.355	0.386	−0.523
Kurtosis	12.968	0.376	6.368	2.448	0.941	0.818
F-value: 1.58						
t-value	–	0.64	0.45	3.67*	3.29*	1.06

Table II.
Descriptive statistics

Notes: This table reports summary statistics for 1,037 funds and benchmark in the sample. Data consists of monthly returns series. It also reports the differences in means of all funds and each benchmark. *Significant at 5 percent level

indicates a better investment:

$$S = \frac{Ri - Rf}{\sigma i} \tag{1}$$

Where R_i is the return on the fund, R_f the risk free rate proxied by the 30-day US Treasury bill rate, and σ the standard deviation of the returns of fund.Second, the Treynor ratio, which considers systematic risk, is used (Treynor and Black, 1973):

$$TREYNOR = \frac{Ri - Rf}{\beta} \tag{2}$$

The Treynor ratio uses β as its measure of risk, it considers only systematic risk of the series, not total risk. This ratio is also referred to as the reward-to-volatility ratio.

The third measure for assessing fund performance is the Information ratio, defined as:

$$IR = \frac{Ri - Rb}{\sigma er} \tag{3}$$

Where R_i is the average return of fund j for the specific period, R_b is the average return for the benchmark portfolio during the period, and σ_{er} is the standard deviation of excess return of fund j. This ratio is used for evaluating managerial skill. It measures the manager's excess return over an appropriate benchmark relative to the standard deviation of those excess returns. The IR effectively eliminates market risk and shows only risk taken from active management. Therefore, the IR shows how a manager has performed per unit of active risk taken.

Another risk adjusted measure is *M*-squared proposed by Modigliani. This method adjusts the returns of a mutual fund to the level of risk in a market index and then measures the returns on the risk-matched fund. It is used to characterize how well a portfolio rewards an investor for the amount of risk taken, relative to that of a benchmark portfolio and to the risk free rate. For example, an investment that took a higher risk than a benchmark portfolio, but only had a slightly better performance, might have less risk adjusted performance than another portfolio that took dramatically less risk relative to the benchmark, but had similar returns. It is computed by multiplying the Sharpe ratio by the benchmark standard deviation and then adding the risk free rate of return:

$$M_i^2 = \frac{Ri - Rf}{\sigma i}\sigma_m + R_f \tag{4}$$

Finally, the Jensen (1968) measure is computed. This measure assesses whether the fund has outperformed a market portfolio by testing whether the α coefficient in Equation (5) is significantly different from zero. Jensen's α is the difference between a series' realized or expected rate of return and its expected position on the security market line given the risk level. If a fund has a positive Jensen's α, it is above the security market line, and is therefore outperforming what the CAPM would predict its performance should be:

$$R_i - R_f = \alpha + \beta(R_M - R_f) + \varepsilon \tag{5}$$

Where R_i is the return on the fund, α is Jensen's α, β is fund's systematic risk, R_f is risk free rate, R_M is return on benchmark portfolio, and ε is random error term. The benchmark index is determined by each fund. These include MSCI AC Far East

Index (conservative allocation, guaranteed, QDII, and equity funds), JPM EMBI Global Index (aggressive bond funds), IA SBBI US1 Year Trsy Index (money market funds, and short-term bond funds), and Barclays US Govt 1-3 Year Index (normal bond funds).

A cross-sectional regression is estimated according to Equation (6) to analyze factors influencing the performances of these funds. These models include fund-specific factors, market factors, and styles of funds:

$$\begin{aligned} Fund\ Performance_i = {} & \beta_0 + \beta_1 AGE + \beta_2 TURNOVER + \beta_3 TENURE \\ & + \beta_4 FLOAD + \beta_5 REDEMP + \beta_6 MANGFEE \\ & + \beta_7 PERATIO + \beta_8 PBRATIO + \beta_9 MKTCAP + \varepsilon \end{aligned} \quad (6)$$

Although any of the risk measure can be used as dependent variable, this study uses two most commonly accepted risk measures, namely Sharpe ratio and Jensen's α (Droms and Walker, 2001; Fortin and Michelson, 2005). The variation in fund performance is explained using three groups of independent variables. First, fund-specific variables include age of fund, turnover, management experience, and fees involved with funds (Gottesman and Morey, 2007; Michelson *et al.* 2008). These variables are defines as following: *AGE* is a measure of a fund's life in terms of months. A positive coefficient estimation for this variable shows that older and well established funds perform better than younger funds. *TURNOVER* is a measure of a fund's trading activity, which is computed by taking the lesser of purchases or sales and dividing by average monthly net assets as reported by Morningstar. A high turnover shows an investment strategy that more actively buys and sells securities. *TENURE* is measured as the work experience of portfolio managers with the fund measured in number of years. *FLOAD* is the initial percentage of sales charges deducted from each investment in the fund. *REDEMP* is the percentage charged when money is withdrawn from a fund. *MANGFEES* is the percentage of costs shareholders paid for management and administrative services.

The second group of independent variables include the following. These ratios are included because investors pay close attention to fund's past performance. Funds also advertise their past performance to attract buyers. These ratios show fund's past performance with *PERATIO* being a fund's weighted average of the P/E ratios of stocks in a fund's portfolio. It shows a fund's investment strategy in the market, and whether it has a value or growth orientation. A high P/E shows investors will pay more to get the funds' earnings. Similarly, *PBRATIO* is the weighted average of the price/book ratios for all stocks in a fund's portfolio. This ratio tells investors how much they are paying for a company's assets, based on historical values. Value investors look for companies that have low price book ratios. The final variable is *MKTCAP*, defined as the market value of a fund in natural log and used as a proxy for size variable. A positive value suggests that larger funds perform better than smaller funds.

The final group of independent variables include dummy variables assigned to each fund based on its orientation. These variables are used to control the orientation of funds while exploring the impact of the first two groups of independent variables. These include equity funds, aggressive allocation, conservative allocation, moderate allocation, aggressive bond, normal bond, short-term bond, guaranteed, money market, and QDII funds.

Performance of Chinese funds

Risk adjusted performance measures

Table III reports risk adjusted performance measures for the entire sample as well as equity and bond funds. Five risk adjusted measures are reported for each group of funds. Furthermore, among each group mean, the mean of the top and bottom 20 percent fund performance are reported. The average Sharpe ratio for the entire sample (1,037 funds) is 0.25. While the top 20 percent performing funds have positive risk adjusted returns (Sharpe ratio of 0.846), the bottom 20 percent performing funds experience negative risk adjusted returns. The difference between Sharpe ratios of these two groups is 0.913. Statistical significance is tested by using mean difference (*t*-values), and shows that the top 20 percent highest performing funds always have statistically higher values than the bottom 20 percent of funds. This is the case for all funds, equity funds, and bond funds. When comparing equity funds with bond funds, bond funds outperform equity funds with a Sharpe ratio of 0.563 compare to 0.160 for equity funds. Similar results are observed for other measures including Treynor ratio, Information ratio, and Jensen's α. For example, the equity funds have an average Jensen's α of 0.489 compared to bond funds αs of 0.546. The *M*-squared measure shows the opposite. The *M*-squared risk adjusted performance measure provides a

	Sharpe ratio	Treynor ratio (%)	Information ratio	*M*-squared (%)	Jensen's α (%)
All funds ($n = 1{,}037$)					
Mean	0.250	3.349	0.241	11.472	0.434
Top 20%	0.846	14.100	1.315	38.604	1.422
Bottom 20%	−0.067	−2.678	−0.466	−4.088	−0.617
Difference	0.913	16.779	1.781	42.692	2.039
t-value	29.84*	13.18*	21.46*	18.03*	37.38*
Equity ($n = 682$)					
Mean	0.160	2.372	0.106	13.236	0.489
Top 20%	0.531	8.082	0.598	42.142	1.605
Bottom 20%	−0.074	−1.531	−0.470	−4.508	−0.758
Difference	0.605	9.613	1.067	46.651	2.363
t-value	12.25*	13.75*	40.98*	13.42*	32.51*
Bonds ($n = 154$)					
Mean	0.563	10.316	0.274	8.877	0.546
Top 20%	1.104	39.364	1.601	29.441	0.794
Bottom 20%	0.225	−9.128	−0.317	0.574	0.278
Difference	0.880	48.492	1.918	28.867	0.516
t-value	13.52*	8.86*	5.72*	18.42*	17.79*
t-value mean difference equity vs bonds funds	−13.06*	−4.56*	−1.86	3.22*	−1.54
Benchmark					
MSCI AC far East	−0.016		−0.254	1.160	
JPM EMBI global	0.242		0.414	16.380	
IA SBBI US 1 Year Trsy Const Mat	0.192		−0.093	13.240	
S&P 500	0.039		−0.227	4.230	
Barclays US Govt 1-3 Year	0.309		−0.028	20.640	

Notes: This table reports five risk adjusted performance measures for the entire fund and equity and bonds funds. *Significant at 5 percent level

Table III. Risk adjusted performance measures

direct comparison among various funds and indices. It also shows how well a portfolio rewards an investor for the amount of risk taken, relative to a benchmark portfolio and to the risk free rate. The mean *M*-squared for equity funds, for example, is 13.23 percent while that of bond funds is 8.87 percent. The top 20 percent of performing funds have an *M*-square of 42.14 percent and 29.44 percent for equity and bond funds. A further mean difference test includes comparing bond and equity funds. The null hypothesis of no difference in risk adjusted measures of equity and bond funds are rejected for the Sharpe ratio, Treynor ratio, and M-squared risk measures. These findings show that there is variation within fund classes that perhaps fund-specific factors may explain these differences. Table III further reports the performances of various bond and stock indices during the same period. Among these, Barclays US Govt Bond Index has the highest Sharpe ratio (0.309) followed by JPM EMBI Global index (0.242). The S&P 500 has the lowest Sharpe ratio. Similar patterns are observed using *M*-squared in which Barclays' US Govt index has 20.64 percent and JPM EMBI Global has 16.38 percent returns. Equity funds have better a Sharpe ratio, Information ratio, and *M*-squared compared to MSCI AC Far East index. Bond funds also have a better Sharpe ratio and *M*-squared than JPM EMBI Global index. These findings suggest Chinese equity and bond funds provide higher risk adjusted returns relative to their benchmark using the majority of risk adjusted measures. These superior performances are more pronounced for the top performing funds.

Table IV reports risk adjusted performance measures based on subgroups of the funds. Again five risk adjusted performance measures are used. Besides risk adjusted measures, the test for differences in mean values of each measure is conducted by using *F*-test and pairwise *t*-test. The *F*-test results show that the null hypothesis of no differences in risk adjusted measures is rejected at 99 the percent confidence interval. Starting with the Sharpe ratio, the best performing subgroup is short-term bond funds with a sharpe ratio of 1.453, followed by money market funds (0.871), and Normal Bond Funds (0.667). The QDII subgroup has the lowest Sharpe ratio of 0.021 followed by equity funds (0.155) then aggressive allocation funds (0.163), and moderate allocation funds (0.175). Regarding Jensen's α measure, the aggressive allocation subgroup is the highest performing (0.916), followed by moderate allocation funds (0.800), and conservative allocation funds (0.627). *M*-squared measurement also has a similar performance ordering. Furthermore, the test of differences in means of equity funds and each subgroups for each risk measure is performed. The equity fund subgroup is selected as the control group because it has the highest number of funds. There are no statistically significant differences among aggressive, conservative ,and moderate allocation funds relative to Equity Funds using the Sharpe and Treynor ratios. The findings in this subgroup analysis confirm that the performance of subgroups vary with respect to most of the risk adjusted measures used. These findings imply that some fund managers are successful at obtaining positive αs in their investments.

Table V reports the analysis of individual funds and categories regarding size of Jensen's α (excess returns) and their statistical significance. For the entire Chinese fund sample, 76 percent of funds (795 out of 1,037) have positive Jensen's αs and approximately less than half (39 percent) are statistically significant at a 95 percent confidence level. On average, these findings show that Chinese funds provide positive excess returns to investors. However, the success rate among types of fund vary. A test of no differences in mean of subgroups is rejected at the 95 percent confidence interval (*F*-value of 14.29). Furthermore, a pairwise test between the equity funds subgroup and each of the other subgroups show that the null hypothesis, concerning equality on the

	Sharpe ratio	Treynor ratio (%)	Information ratio	*M*-squared (%)	Jensen's α (%)
Equity					
Equity funds	0.155	2.142	0.058	12.128	0.343
Aggressive allocation	0.163	2.584	0.232	16.199	0.916
t-value	−0.36	−1.36	−5.02*	−2.59*	−7.33*
Conservative allocation	0.183	3.378	0.184	15.912	0.627
t-value	−0.80	−1.64	−2.24*	−1.11	−2.58*
Moderate allocation	0.175	3.192	0.213	15.435	0.800
t-value	−0.93	−1.71	−4.57*	−2.05*	−6.65*
Bonds					
Aggressive bond	0.397	7.529	−0.024	1.059	0.518
t-value	−9.32*	−3.28*	3.38*	8.68*	−3.66*
Normal bond	0.667	14.544	0.055	23.872	0.582
t-value	−12.96*	−3.57*	0.06	−6.14*	−4.92*
Short-term bond	1.453	−0.224	4.113	2.604	0.565
t-value	−11.33*	6.33*	−9.74*	6.96*	−4.07*
Others					
Guaranteed	0.507	7.757	0.232	37.295	0.548
t-value	−10.16*	−5.68*	−3.16*	−8.15*	−3.67*
Money Market	0.871	0.649	2.648	3.343	0.408
t-value	−25.64*	5.13*	−32.03*	6.82*	−1.41
QDII fund	0.021	0.057	−0.100	2.042	−0.039
t-value	6.40*	6.36*	3.57*	6.85*	6.28*
F-test	80.05*	15.98*	33.1*	15.36*	14.29*

Notes: This table reports mean of five risk adjusted performance measures each subgroup of funds. Equity funds used as control group for statistical comparison. *F*-test is the results of anova used to test the null hypothesis that means of all groups are equal. *t*-values are for the test of pairwise differences in means of equity funds and each subgroup. *Significant at 5 percent level

Table IV. Risk adjusted performance measures based on fund types

size of αs, can be rejected. Among various types of funds, most bond-related funds have positive and statistically significant αs. For example, out of 92 aggressive bond funds, 91 have positive αs, and 51 (56 percent) are statistically significant. All funds within the guaranteed, money market, and short-term bond funds subgroups have positive αs; the latter two groups all have statistically significant αs. The worst performing group is QDII funds – which only about half of the funds have positive αs and among these only 5 percent are statistically significant.

Findings here show that Chinese funds provide excess returns (positive αs) to their investors. There are differences among various fund groups regarding fund performance. Bond-related funds appear to perform better although the number of these funds is relatively small.

Aggressive, moderate, and conservative allocation funds experience positive αs of 91 percent, 93 percent, and 89 percent, but only a smaller fraction (about 33 percent) is statistically significant. The next part the study explores the cross-sectional variations in Chinese fund performance.

Funds	No. of positive αs	No. of negative αs	No. of positive significant αs	No. of negative significant αs	Total	Test of significance in mean t-values
Equity						
Equity fund	321 (66%)	163 (34%)	61 (19%)	0 (0%)	484	–
Aggressive allocation	86 (91%)	9 (9%)	28 (33%)	0 (0%)	95	−7.33[a]
Conservative allocation	16 (89%)	2 (11%)	6 (38%)	0 (0%)	18	−2.58[a]
Moderate allocation	79 (93%)	6 (7%)	26 (33%)	0 (0%)	85	−6.65[a]
Bonds						
Aggressive bond	91 (99%)	1 (1%)	51 (56%)	0 (0%)	92	−3.66[a]
Normal bond	49 (94%)	3 (6%)	49 (100%)	0 (0%)	52	−4.92[a]
Short-term bond	10 (100%)	0 (0%)	10 (100%)	0 (0%)	10	−4.07[a]
Others						
Guaranteed fund	29 (100%)	0 (0%)	23 (79%)	0 (0%)	29	−3.67[a]
Money market fund	53 (100%)	0 (0%)	53 (100%)	0 (0%)	53	−1.41
QDII fund	61 (51%)	58 (49%)	3 (5%)	3 (5%)	119	6.28[a]
Total	795	242	310	3	1,037	

Table V. Jensen's α aggregate results

Notes: This table summarizes the analysis of individual funds and categories regarding Jensen's α and statistical significance of αs. It also provides pairwise t-test for null hypothesis of no difference in the αs of equity fund subgroup and each of the subgroup. [a]F-value, 14.29

Regression analysis of Chinese fund performance

The study analyzes factors influencing the performances of funds. We use either the Sharpe ratio (computed using Equation 1) or Jensen's α (estimated from Equation 5) for each fund as dependent variable. The first estimation uses fund-specific characteristics including *AGE*, *TURNOVER*, *TENURE*, *FLOAD*, *REDEMP*, and *MANGFEE*. The second estimation takes into account market-related variables, including *PERATIO*, *PBRATIO*, and *MKTCAP*. The third model uses dummy variables for the types of funds. To avoid a dummy variable trap, the equity fund subgroup is used as the control group. The next two estimations add dummy variables to Models 1 and 2. The final estimation includes all variables. The same process is repeated when using Jensen's α as a dependent variable.

Table VI reports both summary statistics and correlation coefficients for the independent variables. The mean and median age of Chinese funds are 53.96 and 47. Turnover, PE, and PB ratios are 180.07, 12.98, and 2.27. The mean logarithm of market capitalization is 10.22. The average tenure of fund manager is 2.38 years. Various fees (front load, redemption, and management) charged by these funds range from 0.49 percent to 1.34 percent. The correlation coefficients among the independent variables are reported in Panel B of Table VI. The highest correlation coefficients range from −0.22 to 0.423. The highest correlation is between front load and management fee. Correlation among explanatory variables tells that multicollinearity is not a problem to

	AGE	TURNOVER	PERATIO	PBRATIO	MKTCAP	TENURE	FLOAD	REDEMP	MANGFEE
Panel A Summary statistics									
Mean	53.96	180.07	13.98	2.27	10.22	2.38	1.34	0.49	1.25
Median	47.00	138.44	13.08	2.06	10.20	2.00	1.50	0.50	1.50
Max.	146.00	1783.25	188.68	10.31	14.19	10.00	2.50	2.00	2.00
Min.	12.00	0.00	6.70	0.00	7.43	0.00	0.00	0.00	0.00
SD	32.07	179.55	7.54	0.92	0.85	1.78	0.40	0.29	0.42
Skewness	0.71	2.49	15.88	2.86	0.24	0.98	−1.70	3.01	−1.23
Kurtosis	2.61	14.92	346.47	18.86	3.86	3.78	7.82	17.29	3.66
Jarque-Bera	77.7	5921.5	4223884.0	10096.3	34.31	159.2	1236.4	8530.8	229.9
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	852	852	852	852	852	852	852	852	852
Panel B Correlation coefficients									
AGE	1								
TURNOVER	0.062	1							
PERATIO	0.068	−0.030	1						
PBRATIO	−0.044	0.000	0.338	1					
MKTCAP	−0.128	−0.151	−0.222	−0.167	1				
TENURE	−0.405	−0.182	−0.102	−0.129	0.001	1			
FLOAD	−0.055	0.234	−0.101	−0.061	0.027	−0.013	1		
REDEMP	0.196	0.045	−0.043	0.045	−0.024	−0.158	0.209	1	
MANGFEE	−0.103	0.256	−0.010	0.070	−0.078	0.000	0.423	0.170	

Note: This table summarizes summary statistics and correlation coefficients of independent variables used to analyze the performances of Chinese mutual funds

Table VI. Summary statistics and correlation coefficients of regression variables

influence interpretations of our results. The results of the regression analysis are reported in Table VII and VIII. While the former table uses the Sharpe ratio as dependent variable, the latter uses the Jensen α measures. Both regression estimates are White heteroskedasticity-consistent errors estimates.

The Sharpe ratio is first used as a dependent variable and is applied to six models. Each model adds a new group of independent variables into the analysis. The findings are reported in Table VII. The adjusted R^2 ranges from 0.286 to 0.437. *F*-statistics for all models are statistically significant at a 99 percent confidence level. Model 1 in the first-column uses fund-specific variables as independent variables. Among them, *AGE*, *REDEMP*, and *MANGFEE* variables are statistically significant. *FLOAD* is statistically significant at a 95 percent confidence level. These findings show that more established funds perform better than younger funds. Furthermore, funds with higher redemption fees, front load fees, and management fees have higher risk adjusted performance. Other fund specific-variables are statistically insignificant. The second estimation includes market-related variables, *PERATIO*, *PBRATIO*, and *MKTCAP*. The last two variables are statistically significant at a 99 percent confidence level. Funds with a higher price to book value experience a higher risk adjusted performance measure. The *MKTCAP* variable, on the other hand, is negative, showing smaller funds have a higher Sharpe ratios than larger funds. Estimation three and four incorporate funds types into the analysis. In estimation three, fund-specific variables (*AGE*, *FLOAD*, and *MANGFEE*) continue to be statically significant at a 99 percent confidence level. To avoid the dummy variable trap among fund type variables, the equity fund subgroup is chosen as the control group and other subgroups are interpreted relative to the equity fund. Accordingly, *AGGRESBOND*, *NORMBOND*, *CONSERV*, and *MODER* funds have coefficients of 0.24624, 0.65173, 0.13754, and 0.03135. They are all statistically significant

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	−0.18197	0.30445	−0.15365	0.28931	0.11650	0.11352
	(−6.02***)	(3.39***)	(−4.07***)	(3.54***)	(1.50)	(1.45)
AGE	0.00138	–	0.00112	–	0.00143	0.00130
	(6.52***)	–	(4.80***)	–	(8.71***)	(7.12***)
TURNOVER	0.00001	–	−0.00001	–	−0.00001	−0.00001
	(0.18)	–	(−0.19)	–	(−0.44)	(−0.51)
TENURE	−0.00079	–	0.00190	–	0.00118	0.00243
	(−0.38)	–	(0.91)	–	(0.64)	(1.28)
FLOAD	0.02506	–	0.03100	–	0.03452	0.03927
	(1.97**)	–	(2.44***)	–	(3.05***)	(3.46***)
REDEMP	0.10471	–	0.04956	–	0.09140	0.07317
	(3.63***)	–	(1.28)	–	(3.72***)	(2.58**)
MANGFEE	0.09444	–	0.09335	–	0.07035	0.07201
	(7.73***)	–	(7.44***)	–	(7.26***)	(7.31***)
P/E RATIO	–	−0.00224	–	−0.00170	0.00018	0.00018
	–	(−1.42)	–	(−1.10)	(0.09)	(0.09)
P/B RATIO	–	0.06182	–	0.05123	0.03934	0.03737
	–	(8.44***)	–	(6.72***)	(4.98***)	(4.58***)
MKTCAP	–	−0.02995	–	−0.02847	−0.03654	−0.03554
	–	(−3.47***)	–	(−3.50***)	(−5.10***)	(−4.89***)
AGGRESSIVE	–	–	0.01778	0.07603	–	0.00779
	–	–	(1.87*)	(6.23***)	–	(0.80)
AGGRESBOND	–	–	0.24624	0.16082	–	0.25642
	–	–	(4.27***)	(2.97***)	–	(4.94***)
CONSERV	–	–	0.13754	0.10652	–	0.13082
	–	–	(4.41***)	(3.56***)	–	(4.46***)
MODER	–	–	0.03135	0.08134	–	0.01902
	–	–	(3.17***)	(6.28***)	–	(1.71*)
GUAR	–	–	0.21297	0.15467	–	0.10953
	–	–	(2.55**)	(2.33**)	–	(1.41)
NORMBOND	–	–	0.65173	0.59436	–	0.65369
	–	–	(14.31***)	(12.49***)	–	(13.58***)
QDII	–	–	−0.05721	−0.03559	–	−0.02013
	–	–	(−2.93***)	(−2.46**)	–	(−1.20)
R^2	0.286	0.1795	0.321	0.267	0.419	0.43785
Adjusted R^2	0.281	0.1766	0.31	0.259	0.413	0.42707
Log likelihood	601.8	542.6	623.1	590.9	689.8	703.62000
F-statistic	56.44***	61.85***	30.46***	30.73***	67.56***	40.64***

Table VII.
Cross sectional regression analysis results with sharpe ratio

Notes: This table reports cross sectional regression analysis results. Sharpe ratio is used as dependent variable. independent variables groups include fund related variables, market variables, and fund objectives. *,**,***statistically significant at 10, 5, and 1 percent levels, respectively

at a 99 percent confidence level. These results show that these funds perform better than equity funds after controlling fund-specific variables. *AGGRESSIVE* and *GUAR* variables are positive as well but they perform marginally better than the control group. The QDII subgroup, on the other hand, performs significantly worse than the control group.

Estimation four adds market-related variables with fund type into the analysis. In line with the previous findings, *BPRATIO* and *MKTCAP* have the same sign and continue to be significant. Most of the fund types perform significantly better than the control subgroup of Equity funds. QDII funds also continue to underperform relative to other subgroups. Estimation five adds market-related variables to fund-specific

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	−1.94202	3.35022	−1.86098	3.17827	1.59184	1.50880
	(−4.69***)	(3.52***)	(−3.53***)	(3.62***)	(2.23**)	(2.16**)
	(4.21***)	–	(3.60***)	–	(5.25***)	(4.97***)
TURNOVER	0.00025	–	0.00022	–	0.00003	0.00006
	(0.74)	–	(0.54)	–	(0.12)	(0.19)
TENURE	−0.00087	–	0.00812	–	0.01349	0.01063
	(−0.04)	–	(0.34)	–	(0.73)	(0.51)
FLOAD	0.29755	–	0.30765	–	0.38879	0.39279
	(2.33**)	–	(2.29**)	–	(3.19***)	(3.07***)
REDEMP	0.53866	–	0.40273	–	0.49693	0.68537
	(2.06**)	–	(1.38)	–	(2.54**)	(3.28***)
MANGFEE	0.82643	–	0.82405	–	0.60652	0.61768
	(6.93***)	–	(6.54***)	–	(6.71***)	(6.62***)
P/E RATIO	–	−0.01692	–	−0.01301	0.00390	0.00336
	–	(−1.07)	–	(−0.84)	(0.25)	(0.21)
P/B RATIO	–	0.47026	–	0.42025	0.28999	0.29989
	–	(7.62***)	–	(6.35***)	(4.62***)	(4.55***)
MKTCAP	–	−0.36118	–	−0.35000	−0.40542	−0.41266
	–	(−3.65***)	–	(−3.67***)	(−4.83***)	(−4.80***)
AGGRESSIVE	–	–	0.07858	0.58974	–	−0.03369
	–	–	(1.02)	(4.50***)	–	(−0.42)
AGGRESBOND	–	–	0.93074	0.11904	–	1.03020
	–	–	(3.07***)	(0.80)	–	(4.08***)
CONSERV	–	–	0.57450	0.28659	–	0.51917
	–	–	(2.35**)	(1.40)	–	(1.88*)
MODER	–	–	−0.05373	0.39563	–	−0.18236
	–	–	−0.78	(3.04***)	–	(−2.15**)
GUAR	–	–	0.00876	−0.59747	–	−1.00621
	–	–	(0.02)	(−2.65***)	–	(−2.86***)
NORMBOND	–	–	1.20570	0.50069	–	1.09679
	–	–	(3.65***)	(2.14**)	–	(3.23***)
QDII	–	–	−0.22165	−0.09662	–	0.10518
	–	–	(−0.97)	(−0.57)	–	(0.51)
R^2	0.271	0.196	0.277	0.242	0.431	0.436
Adjusted R^2	0.266	0.193	0.266	0.233	0.425	0.425
Log likelihood	−1232.8	−1274.74	−1229.3	−1249.5	−1127.2	−1123.2
F-statistic	52.34***	68.74***	24.69***	26.81***	70.87***	40.38***

Notes: This table reports cross sectional regression analysis results. Jensen's α is used as dependent variable; independent variables groups include fund related variables, market variables, and fund objectives. *,**,***statistically significant at 10, 5, and 1 percent levels, respectively

Table VIII.
Cross sectional regression analysis results with Jensen's α

variables. All previous fund-related variables, including *AGE*, *FLOAD*, *REEDEMP*, and *MANGFEE* variables, are highly significant. Among market-related variables, *PBRATIO* and *MKTCAP* have the previous signs and are statistically significant. Finally, estimation six combines all variables. The results confirm the previous findings that older funds, higher fee structure, high price to book ratio, and smaller funds continue to perform better than others. After controlling for these variables, among the types of funds, *AGFGRESBOND*, *CONSERV*, *MODER*, and *NORMBOND* continue to be statistically significant, implying that these funds perform better than the control group of Equity Funds.

Table VIII uses Jensen's α as a dependent variable and fund specific, market related, and fund type-related variables as independent variables. Similar to the Sharpe ratio analysis, six equations are estimated and a new set of independent variables are added to the analysis. The Adjusted R^2 ranges from 0.271 to 0.436 from Equations (1)-(6). The *F*-Stat is statistically significant at a 99 percent confidence level. The findings are similar to those of previously reported. For the first equation, only *AGE* and *MAGNFEE* are statistically significant at a 99 percent confidence level for fund-related variables. Among the market-related variables, both *PBRATIO* and *MKTCAP* have statistically significant coefficients. The findings show that older firms with high-fee structures (front load, redemption, and management fee) have better fund performance. Also, funds with smaller market capitalization and a higher price to book ratio perform better than other funds.

Discussion and conclusions

This study provides an analysis of Chinese mutual funds during the period of January 2000 and July 2013. The study examines the fund managers' efforts in searching for αs in their portfolios. These Chinese funds provide US investors with alternative risk exposure for their portfolios. The Chinese market differs from any developed market due to its wide range of market and economic characteristics, including size, liquidity, and regulation. This study evaluates the performance of Chinese funds. The sample includes 1,037 Chinese funds. These funds are classified into subgroups based on fund objectives. Findings show that managers of Chinese funds experience some success in their search for significant αs during this period. Chinese funds provide higher risk adjusted returns than risk adjusted return measures of various relevant indices. After separating mutual funds based on assets in bonds and equity, bond funds appear to have significantly better risk adjusted measures than stock funds during the study period. These results are in line with studies of emerging markets (Polwitoon and Tawatnuntachai, 2006, 2008; Li and Lin, 2011; Hribernik and Vek, 2011).

Using the Sharpe ratio and Jensen's α as dependent variables, the results of the cross-sectional analysis show that among fund-related variables, *AGE*, *FLOAD*, *REEDEMP*, and *MANGFEE* variables are highly significant in explaining cross-sectional variation in fund performance. Among market-related variables, *PBRATIO* and *MKTCAP* have the previous signs and are statistically significant. These findings show that older funds, higher fee structure, high price to book ratio, and smaller funds continue to perform better than other funds. After controlling for these variables, among the types of funds, *AGFGRESBOND*, *CONSERV*, *MODER*, and *NORMBOND* variables continue to be statistically significant. This implies that these funds perform better than the control group of Equity funds.

These findings suggest that investors should consider investing in Chinese denominated funds. After fees, returns to these funds are higher than benchmark index returns. Investors should not make their decision solely based on fund fees, but it is an important metric. Higher fee funds provide higher returns than lower fee funds, implying that fees may show quality or skill of management. Smaller and well established funds provide higher returns so investors should consider the size and the age of the funds in their investment decision. The differences in risk adjusted returns of various subgroups also suggest that investors should be more selective in their investments. This results also have implications for policy-makers. These include increased opportunity to attract cross-border portfolio investments and develop an investment environment and capital market conducive to investment in Chinese funds.

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