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Mutual fund family ownership and stock return: evidence from Chinese stock open-end funds

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Abstract:
In this paper, with the sample data of each semi-annual stock open-end funds from 2008 to 2015 in China, we use multiple linear regression method to study the impact on the stock returns held by mutual fund family common shares. The empirical results show that the deeper fund family common shareholding ratio is, the lower the return on stock is. The lager family common shares width is, the lower stock returns are. The explanation given in this paper is that large depth and width of funds common shareholding means high degree of aggregation of fund family holdings, the private information will be less, meaning high market transparency, stock uncertain information then will be less, compensation for stock returns certainly shrinks, stock returns are then lower.
Keywords: *Stock open-end funds; fund family common shares; stock return*

1 Introduction

Open-end fund industry started relatively late in China, in September 2001 China's first open-end fund Huaan Innovation was founded, but since then, China's open-end fund industry began to get rapid development. At the end of 2015, China has 2722 funds, of which there are 2558 open-end funds, accounting for 93.98% of the total number of funds. Roughly look, the investment styles of these funds are almost completely different and the funds have their own separate management model, but in fact they are not isolated and each belongs to the corresponding fund family. According to the data released by the China Foundation Association, there are 106 fund families holding open funds in 2015 (this article defines the fund family as the whole of all funds managed by the same fund management company).With the increase of the number of funds controlled by the fund management company, fund family has become the organization that cannot be easily ignored on securities market.

Massa through empirical research, found that stocks held by funds did not show more returns

than the market average[1],contrary to Daniel's research findings[2].Wermers, Yao and Zhao found that stocks held by funds can be used to predict the stocks' gains but they did not give detailed predictions in the study, that means no quantitative analysis[3].Elton,Gruber and Green found that there was more serious co-ownership behavior within the same family than different families, revealing that the main reason for the high correlation between family funds is the joint ownership within family and pointing out that such behavior would result in an increase in risk of investing in the same fund family[4].Yiwei Li found fund families common shareholding is more and more serious in China[5].Ke Li,Rong Lu and Yi Xia based on the joint ownership of the fund family to build a hedge portfolio, found that the fund family shares will raise the stock rate of return[6].

There are few domestic studies on the relationship between fund families holding and the returns of the stocks they hold. Although there are studies that the fund family holdings will increase the fund itself and the fund family's rate of return, but to what extent the impact of such acts on stock returns will be is not studied and this is the focus of this paper.

In this paper,we use China's stock open-end funds semi-annual data from 2008 to 2015 as sample, and mainly use multiple linear regression method, with the fund holdings characteristic variables, family shareholding depth and shareholding width, to study the impact of family holdings on the returns of the stocks they hold, and test the impact of decentralization of fund investment on stock returns.

2 Research design

2.1 Research hypotheses

(1) the impact of ownership depth on stock returns:

The greater the proportion of fund families holding shares,fund families will pay more attention to the stock, if holding a single stock to the majority of tradable shares,even can cause the formation of the so-called "Zuozhuang" effect, the stock returns will be bigger.

Hypothesis1:The greater the proportion of fund families holding shares,the higher the stock returns.

(2) the impact of ownership width on stock returns:

Fund families share the same type of stock means the fund families holdings of higher degree of aggregation, the amount of private information is less, the stocks uncertain information is less, the stock income compensation is small; or the rising cost of analyzing all stocks may cause more opportunities missing and error occurs, the stock returns will be smaller.

Hypothesis2: The wider the shareholding of fund families, the lower the stock returns.

2.2 Sample data and data processing

Data of this paper is mainly derived from the RESSET database,the cross-sectional data of the partial-open-type open-end funds and the yield data of the stock are selected from 2008 to 2015, including the number of fund families,fund stock portfolio details, market monthly rate of return and risk-free rate of return and other data, as well as each fund's family attribution and other data.The stocks in the open-end funds holdings list that did not hold by the fund families all the time has been removed.The first step is the families code and fund code processing, match the funds and the fund management companies, and then match the fund families and fund holdings and other details of the data to calculate the number of shares held by the fund families and its annual stock holding market value. Remove the observations that have missing data and summarize the effective samples in Table 1.

Table 1- Fund families and stocks information

Year	Stock Amount	Family Amount	Stock market capitalization (100 million)
2008	970	59	15814.4
2009	1295	60	27873.4
2010	1731	60	24549.7
2011	2082	64	22426.9
2012	2215	70	20729.6
2013	2221	71	19390.5
2014	2457	78	20567.4
2015	2789	99	31817.1

From Table1, it can be seen that the number of fund families holding stocks has been increasing since 2008 to 2015,and the volume of holding shares held by open-ended partial funds has increased, but the growth rate of stocks number has risen significantly faster than the number of fund families. The boom in the second half of 2014 to the first half of 2015 is also reflected by the market capitalization of stocks held by funds.

2.3 Variable description and model settings

(1) fund family holding depth indicator

$$D_{ft} = \sum W_{fit} / S_{it} \tag{1}$$

Among which,Wfit represents the market value of stock i held by the fund family during the period t,Sit is the market value of stock i in the period t or the stock size. So Dft means during the period t,the fund family holding depth of the stock i.The larger the value, the greater the

proportion of fund family's holdings on the stock, the greater the shareholding depth.

(2) fund family holding width indicator

Wit is the number of fund families that hold stock i at time t.This paper chooses logWit to represent the fund family width of stock i in period t.logWit is Wit logarithm,the greater the value,the higher the degree of holding aggregation,which means bigger holding width.

Multivariate regression analysis is mainly to study the relationship between a dependent variable and several independent variables.According to the type of regression model,it can be divided into linear regression analysis and nonlinear regression analysis.In this paper,linear regression analysis model is adopted. In order to avoid the singular matrix, I use $R_{\mathrm{it}+1}-R_{\mathrm{mt}}$ as the dependent variable.

(1) the impact of the depth of shareholding on the stock returns:

$$R_{it+1}-R_{mt}=\alpha+\beta_1 D_{ft}+\beta_2\log S_{it}+\beta_3\log S_{it}*D_{ft}+\sigma_1 \qquad (2)$$

(2) the impact of the width of shareholding on the stock returns：

$$R_{it+1}-R_{mt}=\alpha+\beta_1\log w_{ft}+\beta_2\log S_{it}+\beta_3\log w_{ft}*\log S_{it}+\sigma_2 \qquad (3)$$

Where Rit is the yield of stock i in the period t, Rmt is the market rate of return,which is Rm-Rf + Rf, is the stock returns minus the broader market returns, but since the broader market earnings (RESSET database) has been reduced the risk-free income,so coupled with the risk-free income is the real R-Rm for excess returns.Sit is the market capitalization of stock i at time t,which is stock size,as the control variable.

3 Empirical results and analyses

This section examines whether the shareholding depth and shareholding width of the fund family's shareholding have impact on the stock returns.In the 2008 to 2015 fund sample,the stock open-end funds in the 99 fund families hold total of 814 stocks.

3.1 The impact of shareholding depth on stock returns

From the results in Table2,we can see the semi-annual regression coefficient of Dit is negative except for 2014,the mean is -0.38,and the full sample regression coefficient is -0.31.Overall,the current stock return and the previous period of the depth have negative correlation, so although the depth of the previous period increased by 1,the subsequent shareholding yield was reduced by 0.31.While the stock returns are not significantly increased or decreased as the control variables, the stock size of the previous period increases. The coefficient of shareholding depth and stock size cross item of full sample is not large, but

positive, which shows that the influence of the family holding depth on the excess return of the stock is affected by the stock size level. The joint effect is positive, but the degree of impact is not obvious. Based on the analyses above, it can be found that the empirical results are not consistent with hypothesis1.To this conclusion, given the possible information explanation, the greater the proportion of shares held by the fund families, the higher the degree of aggregation of fund family holdings, which will speed up the reaction of stock price to market information and improve stock market efficiency, stock income compensation will be small.

Table2 is based on formula (2) of the 2008-2015 family ownership depth.

Table 2- Family shareholding depth impact on the stock returns

Data	α	β_1	β_2	β_3	R^2
Jun-08	0.198781	-0.35329	-0.010236	0.018927	0.013722
Dec-08	1.358691	-0.395102	-0.067559	0.027489	0.274581
Jun-09	-0.22036	-2.704204	0.007114	0.148372	0.137581
Dec-09	0.300725	-0.429014	-0.015589	0.024411	0.03189
Jun-10	-0.16678	0.421087	0.007403	-0.018777	0.011768
Dec-10	0.008913	-0.889017	-0.0011	0.051585	0.022018
Jun-11	0.372064	-2.741668	-0.01781	0.141377	0.047102
Dec-11	-0.62766	-1.097362	0.027638	0.067644	0.168232
Jun-12	-0.2178	2.187944	0.008885	-0.091237	0.130642
Dec-12	0.230962	-3.221828	-0.010644	0.166103	0.031825
Jun-13	-0.02268	-0.563803	-0.000719	0.042822	0.067765
Dec-13	0.147161	0.886976	-0.006867	-0.032816	0.056427
Jun-14	0.168272	1.177521	-0.007947	-0.051739	0.027675
Dec-14	-2.1116	1.472241	0.098644	-0.071656	0.283393
Jun-15	-0.62084	-0.611118	0.03168	0.026318	0.044085
Dec-15	0.461178	0.749383	-0.020671	-0.039327	0.030969
Average	-0.04631	-0.3819534	0.001388875	0.0255935	
Full Sample	-0.01757	-0.307477	0.000696	0.01735	0.002575

3.2 The Impact of Shareholding Width on stock returns

From the results in Table3,the semi-annual regression coefficients of logWit are mostly negative, the mean is -0.038,and the regression coefficient of the full sample is -0.026.In general, the stock returns are negatively correlated with the holding width of the previous period. The holdings of the previous period increased by 1, but the next time the shareholding yield decreased by 0.026;and as a control variable, the previous period stock size grows, the current stock earnings did not significantly increase or decrease. The coefficient of shareholding width and stock size is not large, but the coefficient is positive, indicating that

the effect of family shareholding width on stock excess returns will be affected by the scale of stocks. The joint effect is positive, but the coefficient is not up to one ten thousand, the impact on the increase of stock returns is not obvious. Based on the analyses, it can be found that the empirical results are consistent with hypothesis2 and the information hypotheses established. Wit is the number of fund families that holds stock i in period t, the logWit indicator chosen in this paper represents the fund family width of stock i, and the bigger the value of fund families, the higher the degree of fund family aggregation. The larger the index, the higher the degree of aggregation of fund families, the less the amount of private information. When the amount of private information is less, the stocks' uncertain information is less, the stocks income compensation is small and the stock returns are low.

Table3 is the regression results based on formula (3).

Table 3- Family shareholding width impact on the stock returns

Data	α	β_1	β_2	β_3	R^2
Jun-08	0.255811	0.001692	-0.013359	-0.0000083	0.019879
Dec-08	1.304617	-0.000343	-0.063838	0.000016	0.254635
Jun-09	-0.61485	0.007341	0.028264	-0.0000264	0.076899
Dec-09	0.25075	-0.006628	-0.012214	0.0000048	0.030211
Jun-10	-0.08603	-0.007869	0.004092	0.0000265	0.008262
Dec-10	0.006725	-1.09778	-0.020766	0.0000039	0.13978
Jun-11	0.158748	-0.030007	0.046709	0.0000546	0.037066
Dec-11	-1.11099	0.570012	0.1005622	0.0000027	0.190886
Jun-12	-0.80552	-0.000495	0.064001	0.0000094	0.050985
Dec-12	1.588308	0.000188	-0.039887	-0.000039	0.139022
Jun-13	0.600372	0.000278	-0.200164	0.0000318	0.044271
Dec-13	0.377913	-0.035562	-0.009868	0.0000287	0.04788
Jun-14	-0.43096	-0.000881	0.038761	-0.0000075	0.11056
Dec-14	-0.00495	-0.006926	0.017663	-0.0000248	0.210855
Jun-15	-0.54003	0.000582	-0.078339	0.0000037	0.009429
Dec-15	0.003443	-0.003981	-0.055204	-0.0000216	0.073302
Average	0.059584	-0.0381487	-0.01209918	3.4063E-06	
Full Sample	0.029001	-0.026694	-0.008702	0.0000032	0.027441

4 Conclusions

In this paper,multivariate linear regression analysis was used to find fund families holdings of stock holdings on the impact of stock return.The empirical results show that the larger the common shareholding ratio of the fund families, the lower the stock returns and the bigger the family holding width,the lower the stock returns.The holding width and the holding depth both have negative effect.In this paper,the explanation is that the fund family holdings depth

and width larger,indicating higher the degree of holding aggregation,and then less private information.Less private information means higher market transparency and less stock uncertainty information,the stock income compensation will be small.Foreign researches have found that the degree of decentralization of investment is positively related to the rate of return,the difference may be due to the fact that the mutual fund industry in China has just begun to develop and the securities capital markets are not as mature as abroad;or in the sample fund portfolios,even the stocks with the smallest number of shares have scattered the trait risk,so the fund's holding width and depth are not directly related to the stock yield.

This paper may have the following limitations,first,the limitation of the scope of data, the data studied in this paper is calculated based on the fund families semi-annual data.But during the six months,the families stock investment transactions and other details cannot be obtained,such as during the six months, the fund families may have made a number of transactions on a stock.This article does not take the daily data or weekly data into account and the information disclosed is not so detailed.The second half of 2014 to the first half of 2015, the domestic stock market was into a crazy growth,the data this period may be lack of rationality,may also be the reason for the insignificant result and that needs further researches.

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