Institutional Investors and Stock Market Volatility

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Abstract. This paper uses the 111 hybrid funds in 10 years which are across the two bull markets data to calculate institutional investors’ active position. Using Granger causality test, VAR dynamic impact model and GARCH model, we find that the behavior of institutional investors directly affect the stock market returns and exacerbate market volatility. Therefore, institutional investors are not market stabilizers.

Introduction

Whether institutional Investor makes the stock market more stable? The academy has deeply researched it and has differences. Approvers think that institutional investors are rational and hold much larger number of stocks than individual investor, they often take "buy and hold" investment strategy in order to save the transaction costs, Which play a "shock absorption" effect (Hirshleifer et al, 1994). Opponents argue from herding effect (Wermers, 1999) and short-sighted behavior (Scharfstein and Stein, 1990). Because most institutional investors get the same information, and they are under the pressure of competition as well as social evaluation, the herding and short-sighted behavior are stronger than individual investors, then they become the booster of stock market volatility. In the empirical study, there are also differences. some scholars study the stock market and find that institutional investors play a role in stabilizing stock prices (Barber and Odean, 2008; Qibin, Huang Ming and Chen Zhuosi, 2006). On the contrary, some scholars find that institutional investors will further exacerbate stock market volatility (Dennis and Strickland, 2002; Shi Yongdong and Wang Jinle, 2014).

Although the "institutional investors and stock market volatility" has been studied by many scholars, there are still the following shortcomings. On the one hand, in terms of data frequency, most of the literatures are based on quarterly reports of institutional investor holdings, whose time span is too long to keep pace with the rapidly changing stock market. On the other hand, most of the literatures use the overall position changes to judge institutional investor’s behavior, however, it fails to distinguish between index changes and fund managers’ initiative to adjust position. Actually, the active position adjustment is the better way to reflect the behavior of institutional investors.

This article takes the security investment fund as the representative, and use 111 hybrid funds to calculate the institutional investors’ active position adjustment every week from 2006 to 2015. Then, using Granger Causality Test, VAR and GARCH mode research the impact of institutional investors’ active position adjustment on the stock market returns and volatility.

Estimation and Analysis of Active Position Adjustment

Data Description

As the main body of institutional investor, China securities investment fund has entered a rapid development period since 2006. Also, China stock market experienced two large bull markets respectively in 2007 and 2015, during which the large fluctuations in fund positions are conducive
to research. Therefore, this paper calculates the time span of January 6, 2006 ~ December 31, 2015, 10 years totaling 519 weeks.

This paper selects open-ended hybrid fund as the research object for it less constrained by policy and larger changes in position. There are 111 hybrid funds left excluding funds setting up after 2006 and delisting before 2015. The stock market yield uses the CSI 300 index weekly, and the net unit value and stock index data are from the WIND database.

**Overall Fund Position and Active Position’s Measurement**

Fund position refers to the proportion of market value of the stock held by the fund to its net asset value. This paper draws on Qu Ronghua et al. (2014) to measure the overall position of hybrid fund \( \text{fund}_t \) every week.

Firstly, the yields of each fund are compared with the CSI 100, 200, and 500 index yields weekly, and the linear rolling regression is carried out in 20 weeks. Secondly, the 3 coefficients are weighted equally with each fund's net asset ratio to obtain 3 sequence data independent of each fund. Next, use minimizing function to determine the overall fund position.

Fund position changes are due to fund managers actively holding or reducing stock shares, but when managers remain unchanged, market volatility can also lead to changes in fund position. The former is the active position adjustment \( \Delta \text{fund}_{a,t} \), the latter is the natural position adjustment \( \Delta \text{fund}_{n,t} \). Finally, we get the active fund position adjustment \( \Delta \text{fund}_{a,t} \):

\[
\Delta \text{fund}_t = \text{fund}_t - \text{fund}_{t-1}
\]

\[
\Delta \text{fund}_{p,t} = \frac{\text{fund}_{t-1} \times (1 + r_{hs300,t})}{\text{fund}_{t-1} \times (1 + r_{hs300,t}) + (1 - \text{fund}_{t-1})} - \text{fund}_{t-1}
\]

\[
\Delta \text{fund}_{h,t} = \Delta \text{fund}_t - \Delta \text{fund}_{p,t}
\]

(Eq. 1)

**Position Measurement Results and Analysis**

In order to test the measurement result of the fund's position, it is compared with the actual value published by the fund quarterly report. Figure1 shows the comparison of 39 data from the second quarter of 2006 to the fourth quarter of 2015. Most of them have the same peaks and valleys, and the change direction of each sample point is basically the same. Therefore, it is reasonable to study the effect of the fund's active position adjustment on the market by means of the measured value.

![Figure 1. 111 open hybrid fund positions fit chart.](image)

Figure2 shows that the direction of the active position adjustment is in line with the change of the overall position, as well as the change direction of the CSI 300 index. More concretely, starting from the 5th week of 2015, with the fund's initiative to increase position, CSI 300 index climbed to the 23rd week of the highest point 5283 points, then fell down with the fund initiative to decrease
the position. It is indicating that the active fund position adjustment and stock movements have a
strong correlation.

Figure 2. 2015 hybrid fund active position weekly changes.

The Impact of Active Position Adjustment on Stock Market Returns

In order to avoid false regression, the unit root test is carried out on the proportion of active fund
position adjustment and the yield of CSI 300, respectively. At 5% significance level, $\Delta \text{fund}_{a,t}$ and
$\tau_{300,t}$ are horizontal stationary sequences. Therefore, without the need for co-integration test, we
can proceed to the next step of the causal test. We find the active fund position adjustment is the
Granger reason for the change of the CSI 300 index, and vice versa is not established, which shows
the fund manager's previous adjustment has a significant impact on the earnings changes in the
latter part of the stock market.

Then, the impulse response function with lag period of 3 is analyzed by VAR model to further
analyze the dynamic effect of $\Delta \text{fund}_{a,t}$ on $\tau_{300,t}$. The result is shown in figure 3. In the current
period, giving the active position adjustment a standard deviation innovation, its positive impact on
the CSI 300 index yield is small, but the second period has the greatest impact, reaching the
secondary peak in the fourth period, then the lag is gradually weakening and stable. On the contrary,
giving the current CSI 300 index a standard deviation of the positive impact of the innovation, the
result is not significant. There is no denying that the institutional investor’s actively position
adjustment increases stock market volatility from the perspective of changes in revenue, for
increasing position making market index up, and decreasing position making market index down.

Figure 3. The impulse response results.

The Effect of Active Adjusting Position on Stock Market Volatility

Table 1 shows the GARCH model accounting results. In the variance equation, the fund's active
position adjustment has a positive effect on the volatility of the stock market at the 10% significance level. That is, the increase in the stock market will increase the volatility of 0.004939
units for every additional unit. Therefore, institutional investor’s active position adjustment
increases the stock market volatility and expands market risk. The rest of the ARCH and GARCH
items are also highly significant, indicating that the reaction of the stock market fluctuations to external shocks is decreasing at a relatively slow rate. If there are big swings in the stock market, it will be difficult to eliminate in the short run.

Table 1. GARCH model estimation results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
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<tbody>
<tr>
<td>C</td>
<td>0.000898</td>
<td>0.001576</td>
<td>0.569801</td>
<td>0.5688</td>
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<tr>
<td>Variance Equation</td>
<td></td>
<td></td>
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<tr>
<td>C</td>
<td>2.44E-05</td>
<td>1.75E-05</td>
<td>1.393270</td>
<td>0.1635</td>
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<tr>
<td>RESID(-1)^2</td>
<td>0.096326</td>
<td>0.028165</td>
<td>3.420039</td>
<td>0.0006</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.890704</td>
<td>0.033398</td>
<td>26.66904</td>
<td>0.0000</td>
</tr>
<tr>
<td>\Delta f_{\text{fund},t}</td>
<td>0.004939</td>
<td>0.002928</td>
<td>1.687017</td>
<td>0.0916</td>
</tr>
</tbody>
</table>

Analysis Conclusion

In order to verify whether the institutional investment has played a stable role in the stock market, we must find reasonable evaluation criteria. Therefore, this paper innovatively digs the proportion of active fund position adjustment, which can accurately observe the behavior of institutional investors. Based on the above empirical analysis, this paper draws the conclusions that institutional investor’s behavior directly affects the stock market returns and exacerbates market volatility.

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References


