Does incubation matter when copying equity funds in China?

Abstract

This study investigates the impact of incubation on the effectiveness of copycat funds in the largest emerging market, China. The empirical findings are as follows. First, unlike the U.S., the overall findings exclude the possibility of successfully copying equity funds in China. Second, an advisory company's fund incubation makes it harder to free-ride on new funds than old funds. Third, incubation is generally undertaken for new funds in a bullish market so that copycat returns of new-minus-old funds have a negative correlation with market returns. Fourth, the effect of long Chinese Lunar Year holiday impairs the performance of primitive funds, consequently, copying is effective in January and February. Finally, logit analysis shows that copying is successful for those funds with low performance and low turnover ratios.

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1. Introduction

The disclosure of fund portfolio holdings has been an important topic of debate among academics, practitioners and regulators. Wermers (2001) warns that more frequent portfolio disclosure will have the following potentially negative effects on fund performance: front-running, free-riding, cost-increase in providing liquidity, and costly tax-management strategy of funds. However, despite the costs of portfolio disclosure, in May 2004, the Securities and Exchange Commission (SEC) in the U.S. adopted enhanced regulations to increase the frequency of portfolio disclosure from semi-annually to quarterly in order to improve the monitoring of mutual fund compliance. This change implies that portfolio management transparency is more beneficial to fund investors than its potentially negative effects. However, the opponents of this disclosure worry about the "free-riding strategy" on well-performing equity funds by simply mimicking their portfolios even though the portfolio information is two-months old when it is published.

Frank et al. (2004) is the first academic attempt to quantify the potential costs of disclosure by testing whether copycat funds can earn excess returns over actively-managed primitive funds. They find that copycat funds have the potential to generate returns that are roughly comparable to the returns on primitive funds. More recently, Parida and Teo (2013) point out the importance of a balanced policy for capital markets between the costs and benefits of portfolio disclosure. Verbeek and Wang (2013) suggest that mutual funds can suffer from information disclosure requirements, and Dyakov and Verbeek (2013) propose that publicly available information on fund flows and holdings can aggravate the situation of mutual funds that are already in distress. However, Agarwal et al. (2013) find that mandatory disclosure improves stock liquidity despite the costs on informed investors.

Most studies on this issue have focused on the U.S. mutual fund markets. They have a longer history than any other markets in the world and therefore have well-educated investors. Consequently, one could ask whether findings in the U.S. are the same as those that could be uncovered in developing fund markets. To answer such a question, this study investigates the effectiveness of copying equity funds in the largest developing market, China. However, to understand Chinese equity fund markets, it must be born in mind that up to the end of 2013 no fund has been terminated since the first offering of equity funds in 2002. In a

sense, this implies that there is no survivorship bias of the fund data; however, there could also be burdensome pressure on advisory companies to attract investors' attention or to keep the total net assets (TNAs) of a fund from falling below any predetermined level.[1] In this context, fund advisory companies must foster new mutual funds so as not to lose investors' interests. They must also do their best to enhance the performance of their own new equity funds to attract sustainable TNAs during their infant periods in either a fair or unfair way. This kind of fostering is called "mutual fund incubation" as described by Evans (2010) in the U.S. Evans (2010) finds that incubated funds outperform non-incubated funds by an annual 3.5% risk-adjusted return on average. Nevertheless, as mentioned above, incubation can be done in either a fair or unfair way; however, we are not interested in the fairness or legality of incubation because the purpose of this study is not to examine how incubation is executed.

There are two types of incubation in the U.S.: private and public. As described by Evans (2010), private incubation is the conversion of the best-performing private accounts or funds managed by an advisor into public fund offerings, which generates backfilling bias. Public incubation is a decision as to which funds will be opened to the public after many new funds are run for a period sufficient to generate a track record. Non-selected funds do not have tickers and often not reported to Morningstar, CRSP, Lipper, or other fund database until they are ready to be opened to the public. Unlike the U.S., China only has public incubation. However, public incubation in China is totally different from that of the U.S., so that it is not a decision as to fund offering to the public; instead, if when certain requirements are satisfied, a new fund must be set up and opened to the public. As such, there seems to be significant pressure on advisory companies to maintain or create a large fund during the infant period; consequently, new funds must generally be incubated. Hence, it is easy to understand why new funds outperform old funds. In addition, mutual fund incubation may influence the effectiveness of copycat funds. China has a relatively short history of mutual funds and there will be a significant number of new equity fund offerings in the future as a result of rapidly developing capital markets. At this stage, it is very important for fund investors to understand the effects of such incubation on copycat fund performance.

We investigate the impact of fund incubation on the effectiveness of copying equity funds in China. This study contributes to the extant literature in two ways. First, this is the

[1] Chinese fund advisory companies seem to be afraid of acquiring a bad reputation caused by warnings from the regulatory authority or the failure of an equity fund. For an overview of the Chinese mutual fund market and industry, see Ko et al. (2014).

first attempt to analyze the impact of incubation on the effectiveness of copying equity funds in the largest emerging market. Second, this study identifies the determinants of successful copy for new and old funds.

The paper proceeds as follows. The next section reviews the set-up and holdings-disclosure rules and practices of equity funds in China. Section 3 discusses the data and methodology. Section 4 examines the empirical evidence. The final section concludes the paper.

2. Regulations for fund set-up and holdings disclosure in China

2.1 Set-up rules and practices

As of June 2013, the public offering of Chinese funds should be processed under the Securities Investment Fund Law (*SIFL*, articles 51~61) of the People's Republic of China. The public offering of a fund should be registered with the China Securities Regulatory Commission (*CSRC*), which is the securities regulatory authority of the State Council.[2] A fund's shares may be offered only after the application for its registration is approved. The fund advisor should conduct the fund offering within six months of receiving the registration approval document. Upon the expiration of the fund offering period, the number of fund shares sold and the number of fund shareholders must reach the approved minimums for an open-end fund. The fund advisor should, within ten days after the expiration of the fund offering period, employ an approved capital verification institution to conduct capital verification. Within ten days of receiving the capital verification report, the advisor must submit the report to the CSRC, undergo the fund recordation formalities, and issue a public announcement. The capital raised during the fund offering period should be deposited in a special account, and no one may use such capital before the completion of the fund offering. Finally, the fund is allowed to invest its money into stock and bond markets, and its performance must be recorded and publicly announced. There must be neither backfilling bias nor any decision to offer a fund to the public.

[2] The CSRC, a ministerial-level public institution directly under the State Council, performs a unified regulatory function over the securities and futures market of China according to the relevant laws and regulations, and with the authority of the State Council. It also maintains an orderly securities and futures market, and ensures the legal operation of the capital market. For further details, see the website of the CSRC (http://www.csrc.gov.cn/pub/csrc_en/about/).

A subordinate regulation of the SIFL, namely the Administrative Measures for Operations of Securities Investment Funds (*AMOSIF*, articles 11 and 12), specifies the detailed process and requirements for fund offerings. The term for fund raising may not exceed three months from the start of selling fund shares. Article 12 states that a fund manager must also go through the formalities for capital verification and fund archival filing when the fund raising term expires, and the total amount of fund shares raised meets the requirements of article 59 of the SIFL. According to article 12 of AMOSIF, one of the following two conditions should be fulfilled: ① The total number of fund shares raised is not less than 200 million, the amount is not less than 200 million yuan, and the number of fund shareholders is not less than 200; ② When a fund advisory company raises funds, the amount of fund shares that the shareholders of the company, the company's own funds, the senior managers, the fund managers or other personnel of the company subscribe to is not less than 10 million yuan; such fund shares are held for not less than three years; the total number of fund shares raised is not less than 50 million; the amount of funds raised is not less than 50 million yuan; and the number of fund shareholders is not less than 200.[3]

As aforementioned, up to the end of 2013 no fund in China has been terminated since the first offering of equity funds to the public in 2002. The SIFL specifies the conditions for terminating a fund in article 81; however, the conditions are related neither to fund size nor the number of shareholders.[4] The AMOSIF does not specify any termination rules for an open-end fund with regard to fund size or the number of shareholders. A fund shareholders' meeting must decide to terminate the contract if the shareholders want to end a fund when its TNAs are falling below a predetermined level due to the absence of investors' interests. Such a meeting does not happen in practice because investors can leave a fund by redeeming their shares at its NAV at any time. Instead, to check the status of a fund, article 44 of the AMOSIF states the fund managers' obligations regarding the maintenance level of fund size and the number of shareholders.[5] If a fund manager breaches article 44, he/she shall be given

[3] Before June 19, 2012, the first condition was the only requirement.

[4] Article 81: Under any of the following circumstances, a fund contract shall terminate: (1) the term of the fund contract expires without any renewal; (2) the fund shareholders' meeting decides to terminate the contract; (3) the functions of the fund management institution or fund custodian terminate and no new fund management institution or fund custodian undertakes the functions within six months after the termination; (4) other circumstances as agreed upon in the fund contract.

[5] According to article 44, if the number of fund shares is less than 200 or the TNAs are less than 50 million yuan after the set-up of a fund, a fund manager should issue an immediate report to the CSRC. If the aforementioned circumstances have continued for 20 working days, the fund manager shall explain the reasons to the CSRC and submit the settlement plans.

a warning or fined in accordance with article 52. Such conditions exert significant pressure on a fund manager to maintain a minimum fund size and number of shareholders. For a fund manager to maintain a minimum level of TNAs, there are two ways to successfully set up an equity fund.

The first is to raise money from a sponsor or financial institution to artificially protect the TNAs of a fund from falling below 50 million yuan when its TNAs are likely to decrease through severe redemption. Such a method of raising money is certainly a remedy but is more costly than a bank loan. Consequently, if the TNAs of a fund begin to fall, the advisory company acquires a bad reputation as well as incurring the high costs associated with the injection of money. In this situation, the simultaneous selling and redemption units increase dramatically.[6] The second way is the public incubation of a new fund. To avoid the high cost of raising money from a sponsor, advisory companies can adopt a preventive approach by coercively enhancing the performance of new funds during the infant periods in either a fair or unfair way.[7,8] Although new funds do not always outperform old funds, such a practice makes it easy to understand why new funds could outperform old funds.

To confirm our conjecture, we illustrate the cumulative excess returns of new and old funds over benchmark in Figure 1. Panel A shows the cumulative excess returns over benchmark since the establishment of a fund. The dashed (dotted, solid) line represents the cumulative returns for new funds (old funds, new–minus–old funds). Returns of old funds are calculated by matching new funds. If a new fund was set up at the end of June 2005, returns for this new fund will be calculated from July 2005 to May 2007. From July 2005 to May 2007, matched returns are calculated for old funds that exclude any new funds. As expected, new funds outperform old funds from the fourth month after the set-up. The difference between the cumulative excess returns for new and old funds reaches record high of 9.02% in the 15th month. In the 23rd month, the difference is 6.8%, which is very similar to the annual average of 3.5% reported by Evans (2010) in the U.S. This implies that the effect of fund

[6] For example, an equity fund was set up on November 9, 2011 in China. It had beginning units of 83,456,756 in 2012. During 2012, selling units were 56,246,650, and redemption units, 87,115,956. Its TNAs almost went to the minimum level of 50 million yuan. Its redemption (1,943,930,622) was more severe for 2013 than 2012. As a consequence, selling units reached 1,966,226,305 in 2013. Most selling units must be money injection by a sponsor that requires a high cost.

[7] From the previous studies in the U.S., we understand that there exist so many ways to improve the performance of equity funds that include cherry picking, wealth transfer, portfolio pumping, and allocation of IPO stocks and so forth. See Gaspar et al. (2006) and Carhart et al. (2002).

[8] According to an article written by Fu Jian Li in Securities Times dated on September 6, 2010 (http://www.stcn.com/), new funds have outperformed old funds.

incubation is also clear in China as it is in the U.S. Panel B shows the cumulative excess returns over benchmark from 2004 to 2013. This figure excludes the problem of overlapping matched returns for old funds in Panel A. If fund incubation exists, the difference of excess performance between copycat and primitive funds continues to widen as time goes by. For each month, all funds are divided into new and old funds. The difference continues to widen as time goes by as shown in Panel B. In sum, Figure 1 confirms that new funds must outperform old funds because of fund incubation. The outperformance of new over old funds is also consistent with the result of Gaspar et al. (2006, the columns of (5) and (6) in Table III, p. 86).

***** Insert Figure 1 here! *****

2.2 Holdings-disclosure rules and practices

On May 10, 2004, the SEC introduced a regulation by issuing the Shareholder Reports and Quarterly Portfolio Disclosure of Registered Management Investment Companies. Under this regulation, registered management investment companies in the U.S. must disclose their complete portfolio schedules on a quarterly basis by filling details with the SEC. According to Rule 30b1-5, every such company shall file a quarterly report on Form N-Q not more than 60 days after the close of the first and third quarters of each fiscal year. Portfolio holdings at the close of the second and fourth quarters are disclosed in the certified shareholder report on Form N-CSR. All report details must be certified by the company's principal executive and financial officers and made available on the EDGAR (Electronic Data-Gathering, Analysis, and Retrieval system). The complete portfolio holdings should be provided to shareholders upon request, free of charge.

In China, semi-annual portfolio disclosure is required according to the Administrative Measures for Information Disclosure of Securities Investment Funds (*AMIDSIF*). Article 19 of the AMIDSIF states that a fund manager shall compile and complete a semi-annual fund report within 60 days from the final day of the first half year, publish the text of the report on its website, and publish a summary in the CSRC's *designated newspapers and periodicals*. Such newspapers and periodicals include China Securities Journal (http://www.cs.com.cn/), Securities Times (www.stcn.com/), Shanghai Securities News (www.cnstock.com/), Securities Daily (www.ccstock.cn/), Chinese Financial News (www.financialnews.com.cn/), and Chinese Reform News (www.crd.net.cn/). According to the Contents and Forms of the Semi-annual Fund Report announced on July 1, 2004, a fund

report should include the following: asset allocations, industry classification of stocks, stock holdings in a descending order of capitalizations, stocks with significant proportional changes, bond holdings, detailed information on the top five bond holdings, footnotes on investment assets.

On August 26, 2008, the CSRC announced a regulation, i.e., "Introduction of XBRL Taxonomy of Securities Investment Fund Information Disclosure," regarding the information disclosure of funds. According to the announcement, information disclosure by advisory companies should be based on the XBRL (eXtensible Business Reporting Language) format. Since July 20, 2009, fund information has been available on the electronic disclosure system (http://fund.csrc.gov.cn) of the CSRC to investors, free of charge. This information includes daily NAVs, quarterly reports, semi-annual reports, and annual reports of securities investment funds.

3. Data and copycat fund returns

3.1 Data

The first open-end equity fund, i.e., the Guotai Jinying Growth Equities fund, was set up on May 8, 2002. However, holdings disclosure has only been enforced since June 2004; therefore, the sample period of this study starts from September 2004 because we assume a delay of 60 days for holdings disclosure. Thus, the sample period covers 112 months from September 2004 through December 2013.

Stock returns are obtained from the GTA China Stock Market and Accounting Research (CSMAR) databases. We use Standard & Poor's (S&P)/CITIC indexes for stocks and bonds to calculate benchmark returns. Benchmark returns are 80% of S&P/CITIC stock index returns plus 20% of S&P/CITIC bond index returns. Fund data are collected from the following three websites: Hexun (www.hexun.com), JRJ (http://fund.jrj.com.cn), Eastmoney (http://fund.eastmoney.com). These data include fund returns, quarterly TNAs and outstanding units, quarterly sales and redemption units, and semi-annual portfolio holdings.

To investigate the impact of incubation on the effectiveness of copycat funds, the sample funds are divided into new and old funds. A fund is classified as a new (old) fund in the current month if its age is less than or equal to (greater than) 23 months. Table 1 shows the summary statistics of the sample funds. The number of funds has increased rapidly over

the years, although the growing stability of the Chinese fund industry has led to the number of new funds becoming relatively smaller compared to old funds. For the most part, the average returns of new funds are likely to be greater than those of old funds over the year. This is consistent with the results shown in Figure 1. Shortly after the consecutive and unparalleled soaring stock markets in 2006 and 2007, Chinese investors experienced a dramatic fall in 2008. Unsettled by this poor performance, investors have become less likely to buy new funds; consequently, since 2009 the average size of new funds is much smaller. In 2013, the average size of new funds is just 411 million yuan, which implies that incubation is more important than before.

***** Insert Table 1 here! *****

3.2 Calculation of copycat fund returns

We compute copycat fund return as the return of a hypothetical buy-and-hold portfolio that invests in the most recently disclosed holdings and is rebalanced at the next disclosure date. To compare primitive fund returns directly with copycat fund returns, we consider trading costs to calculate copycat fund return at every rebalancing time. Monthly copycat fund return (CFR_t^j) is calculated as follows:

$$CFR_t^j = \sum_{i=1}^{M_{t-\tau}^j} w_{i,t-1}^j R_{i,t}, \quad (1)$$

where $R_{i,t}$ is the return on asset i; $M_{t-\tau}^j$ is the number of assets in fund j at the most recent disclosure date at time $t-\tau$; and $w_{i,t-1}^j$ represents portfolio weights. The portfolio weights ($w_{i,t-1}^j$) are given by

$$w_{i,t-1}^j = \frac{N_{i,t-\tau}^j P_{i,t-1}}{\sum_{i=1}^{M_{t-\tau}^j} N_{i,t-\tau}^j P_{i,t-1}}, \quad (2)$$

where $N_{i,t-\tau}^j$ is the number of shares of asset i held by fund j at the most recent disclosure date at time t-τ; and $P_{i,t-1}$ is the stock price at the end of the prior month. Assets consist of three classes: stocks, bonds, and cash. Stock returns can be easily obtained from the GTA

CSMAR databases. Bond returns are calculated by the rate of change in the S&P/CITIC bond index, and cash returns are bank deposit rates. Trading costs consist of brokerage fees and tax. A minimum fee of 0.05% is charged on a one-way transaction, and a tax of 0.1% is charged on sales amounts. These trading costs are included at each semi-annual rebalancing.

4. Empirical evidence

4.1 Effectiveness of copycat funds and the impact of incubation

We test the effectiveness of copycat funds first. If copying equity funds is effective, the excess performance of copycats over primitives must be significantly positive. As noted, portfolio holdings are disclosed semi-annually (i.e., June and December) after a delay of 60 days. This study therefore assumes a delay of 60 days (two months) for portfolio disclosure. In practice, portfolio holdings are disclosed at the ends of February and August. To test the impact of delay, this study assumes additional delays of 30 and 0 day(s) as well. After each delay period, copycat funds are formed and their returns are compared with the returns of matching primitive funds. Time-series average returns of all primitive and copycat funds are averaged to calculate cross-sectional average returns for all, new, and old funds.

Table 2 shows the average performance of primitive and copycat funds. Panel A assumes a delay of 60 days. Returns for all primitive funds are calculated for the sample period matched to copycat funds. The average monthly return of all primitive funds is .59, which is highly significant in a statistical sense. Interestingly, the average return of all copycat funds is .58, which is similar to that of all primitive funds. Consequently, the average return of copycats over primitives is negative and statistically insignificant, which implies the failure of copying equity funds in China. An overall conclusion regarding this issue can be drawn after reviewing the additional results that assume delays of 30 and 0 day(s).

***** Insert Table 2 here! *****

As expected, the average return of new primitive funds is greater than that of old primitive funds. Surprisingly, the average return of new copycat funds (.59) is much smaller than that of old copycat funds (.67). As Kacperczyk et al. (2008) point out, unobserved actions of equity funds create the return gap between returns for copycats and primitives.[9]

[9] Do such actions of new (old) funds create (destroy) value? If the actions are fair such as elaborate stock selection, market timing, or other investment skills, they must create value for fund investors. They can also be

Consequently, the average return of new copycats over primitives has a significantly negative value of -.11, but that of old copycats has a marginally significant positive value of .06. Because the marginally positive excess return is not large enough to draw a conclusion for old funds, it is not appropriate to say whether copying old equity funds is effective or not. The last column of Table 2 indicates the impact of incubation on the effectiveness of copycat funds. We calculate the difference ("New-Old") of the average returns of copycats over primitives between new and old funds. The average new-minus-old return has a significantly negative value of -.16. This suggests that an advisory company's incubation makes it harder to free-ride on new funds than old funds.

Panel B and C show the results that assume delays of 30 and 0 day(s). The average returns for new primitive funds vary according to different delay periods because they lose two (one) more observations for 60 (30) days' delay than for no delay.[10] However, the average returns for old primitive funds are the same across all delay periods because such funds always have recent portfolio holdings and do not lose any observations. Unlike the result in Panel A, the average returns of copycats over primitives have significantly negative values of -.07 for delays of both 30 and 0 day(s) although the effectiveness of copycat funds should be enhanced when the delay becomes shorter. When combining these findings with those in Panel A, we are able to say that copying equity funds is not effective in China. Like the results in Panel A, however, the average returns of copycats over primitives are significantly negative for new funds, but not significant for old funds. Further, the average new-minus-old returns have significantly negative values of -.15 and -.19. These findings confirm our conclusion that new funds are harder to free ride on by copying than old funds. It is also noteworthy that the average returns of copycats over primitives are not significant for old funds although the delays are shortened to 30 and 0 day(s). This excludes the possibility of successfully copying old funds. Based on the above findings, we suggest that more frequent disclosure of portfolio holdings (i.e., quarterly disclosure) could enhance the

unfair such as portfolio pumping, which pushes stock prices artificially and temporarily. When it comes to the practice of unfair family strategies as in the U.S., unobserved actions could be wealth transfer between new and old funds in the same advisory company. [See Gaspar et al. (2006).] Wealth transfer between new and old funds must be unfair and illegal in any country. However, wealth transfer could exist regardless of whether regulatory authorities notice or not. At the end of 2008 (2013), Chinese advisory companies had an average of 4.85 (8.60) open-end equity and hybrid funds. Wealth transfer is possible with these numbers of equity and hybrid funds per advisory company. However, any further analysis goes beyond the scope of this study.

[10] Due to the absence of portfolio holdings when they are first created, new funds lose one to six monthly observations regardless of delay when copying equity funds.

transparency of equity mutual funds without causing any troubles to fund managers and investors in China.

4.2 Annual analysis of market conditions with regard to copying equity funds

According to Gaspar et al. (2006), wealth transfer from a donor fund to a donee fund is generally possible when the former experiences high performance. Hence, incubation would be easy to execute when the market is notably bullish. In a sluggish market, incubation is very dangerous to advisory companies because the performance of a donor fund can be terribly worsened to the extent that its investors leave fund. On the other hand, a fund manager may do his/her best to enhance the performance of a new fund in a fair way by adopting, for example, unsystematic risk-increase strategy (i.e., an industry concentration or active share strategy), which could in effect be incubation.[11] This type of unsystematic risk-increase strategy could also be successful in a bullish market compared to a bearish market. We now investigate the impact of incubation on copying equity funds in the context of performance-related market conditions.

Table 3 shows the excess performance of copycats over primitives with market performance across years. All copycat fund returns assume a delay of 60 days for holdings disclosure. To check the impact of incubation on copying equity funds in the context of market conditions, we examine the average excess new-minus-old returns of copycats over primitives. If incubation is successful in a bullish market, the excess returns of new copycat funds should be less than those of old copycat funds. Consequently, the average new-minus-old returns should be significantly negative in a bullish market and non-negative in a bearish market. In other words, there should be a negative correlation between the average new-minus-old returns and market returns. Chinese stock markets have experienced unparalleled high returns in 2006, 2007, and 2009, and terribly low returns in 2008 and 2011. As expected, the average new-minus-old returns are significantly negative in 2007 and 2009, and significantly positive in 2011. Statistical significance is also observed for the average new-minus-old returns in 2010 and 2013 even without strikingly positive or negative market returns. This implies that the excess returns of new copycat funds should be less than those of old copycat funds in a bullish market because of fund incubation. The effect of incubation is also confirmed by the great negative correlation of -.78 between the average new-minus-old returns and market returns.

[11] See Cremers and Petajisto (2009) and Kacperczyk et al. (2005).

***** Insert Table 3 here! *****

4.3 Calendar-month analysis of market conditions with regard to copying equity funds

A calendar-month analysis is an alternative to the prior annual analysis to study the role of market conditions in copying equity funds. Unlike the annual analysis, calendar-month analysis gives a special characteristic to each month. For example, Carhart et al. (2002) present evidence that fund managers inflate quarter-end (especially, year-end) portfolio prices with last-minute purchases of stocks already held. This represents so-called "portfolio pumping" that inflates the NAVs of equity funds artificially and temporarily. If the same behavior exists in China, copycat funds should particularly fail in March, June, September, and December. On the other hand, fund returns should not be good relative to market or benchmark returns in January and February because fund managers are not generally active before and after the long Chinese Lunar Year holidays. In this circumstance, copycat funds are likely to outperform primitive funds. Figure 2 compares the average fund returns with market and benchmark returns across calendar months. As expected, equity funds outperform market and benchmark in March, June, and September, and underperform them in January and February. However, such behavior does not necessarily imply any negative or positive effectiveness of copycat funds, but just possible evidence for the effects of portfolio pumping and the long Chinese Lunar Year holiday.

Table 4 shows the average monthly excess returns of copycats over primitives for all, new, and old funds across calendar months. The results of all funds give us an overall picture about the effectiveness of copycat funds. Statistical significance is not obvious in Table 4 due to the very small number of observations (i.e., 9 or 10). Copycat funds outperform primitive funds in January and February, which might be originated from the possibility that the long Chinese Lunar Year holiday impairs the performance of primitive funds. In contrast, if portfolio pumping artificially enhances the performance of primitive funds, copycats can underperform primitives. Excess returns of copycats over primitives are negative in March and June only, but not in September and December. Why not in December? Many Chinese advisory companies since 2009 have changed the evaluation time of fund performance from December to November to prevent window dressing and portfolio pumping at the end of each year that are popular in the U.S. Naturally, copycat funds are not likely to outperform primitive funds in November because many fund managers are doing their best to enhance fund returns. Fund managers are less concerned about fund returns after performance

evaluation; consequently, we can observe the positive average excessive return of copycats over primitives in December.

Our main concern is the impact of incubation on the effectiveness of copying equity funds, which can be shown by average new-minus-old returns. Statistical significance is observed only in February, which has a negative average new-minus-old return. The effect of the long Chinese Lunar Year holiday seems to apply only to old funds, but not to new funds. Hence, the effectiveness of copying equity funds is strikingly influenced by the impact of incubation in February. We obtain a value of -.80 for the correlation between average new-minus-old returns and market returns. Together with the results of the prior annual analysis, we suggest that incubation is easily possible when stock markets are bullish, but very difficult when they are bearish.

***** Insert Figure 2 here! *****

***** Insert Table 4 here! *****

4.4 Determinants of successful copycat funds

Although copying equity funds is not normally successful in China, it may sometimes work. We now identify the determinants of successful copycat funds through logit analysis. We attempt to explain the successful copycat funds by using the following characteristic variables (available frequency): net flow (quarterly), excess performance over benchmark (monthly), TNAs (quarterly), turnover (semi-annual), daily standard deviation (monthly), and the number of holding stocks (semi-annual). In order to match the frequencies of all characteristic variables, we use semi-annual returns for the logit analysis. Returns of copycat funds are calculated with semi-annual holdings data assuming a delay of 60 days. We identify the determinants with the following logit model:

$$\begin{aligned} I(R_{j,t}^{copycat} - R_{j,t}^{original}) = \alpha &+ \beta_1 Net\_flow_{j,t-1} + \beta_2\, Excess\_ret_{j,t-1} + \beta_3\, ln\_TNA_{j,t-1} \\ &+ \beta_4 Turnover_{j,t-1} + \beta_5\, Std\_dev_{j,t-1} + \beta_6\, ln\_Number_{j,t-1} \\ &+ Dummies\ for\ years\ and\ families + \varepsilon_{j,t} \end{aligned} \quad (3)$$

The dependent variable is an indicator variable that takes 1 if the return of the copycat fund ($R_{j,t}^{copycat}$) is greater than that of the primitive fund ($R_{j,t}^{original}$), and 0 otherwise. The coefficients are estimated using independent variables for the prior period. The independent variables include net flow, excess return over benchmark, the log of TNAs (fund size), daily

standard deviation of excess return over benchmark, the log of the number of holding stocks, yearly dummies, and family dummies. Net flow is calculated by subtracting redemption units from sales units and dividing by the outstanding units of fund j at the end of time t-1.

$$\text{Net\_flow}_t^j = \text{Inflow}_t^j - \text{Outflow}_t^j = \frac{\text{Sales Units}_t^j - \text{Redemption Units}_t^j}{\text{Outstanding Units}_{t-1}^j} \tag{4}$$

The turnover ratio of an equity fund is not disclosed although it could have a very important implication for any explanation of successful copycat fund determinants. As an alternative, this study estimates turnover ratio from portfolio holdings as follows:

$$\text{Turnover}_t^j = \frac{\text{Min}(\sum_{i=1}^{M_t^j} \text{buy}_{i,t}^j, \sum_{i=1}^{M_t^j} \text{sell}_{i,t}^j)}{(\text{TNA}_{j,t} + \text{TNA}_{j,t-1})/2} \tag{5}$$

where $\text{buy}_{i,t}^j = (N_{i,t}^j - N_{i,t-1}^j) P_{i,t}$ if $(N_{i,t}^j - N_{i,t-1}^j) \geq 0$, 0 otherwise,

$\text{sell}_{i,t}^j = (N_{i,t-1}^j - N_{i,t}^j) P_{i,t}$ if $(N_{i,t}^j - N_{i,t-1}^j) < 0$, 0 otherwise,

M_t^j = the total number of assets held at the ends of both time t-1 and t,

$N_{i,t}^j$ = the number of shares of asset i held by fund j at the end of time t.

Table 5 shows the results of logit analysis. For all funds, prior performance and turnover ratio are the determinant of successful copycat funds. In other words, copying is successful for those funds that have low performance and low turnover ratios. Although investors can obtain higher returns compared to primitive funds with low performance and low turnover ratios, generally their returns would be low due to the low performance of primitive funds compared to those of average equity funds, which implies that copying is not effective from the viewpoint of performance. Our findings exclude the possibility of Verbeek and Wang's (2013) concern about free-riding on portfolios disclosed by past winning funds.

Meanwhile, new and old funds show similar patterns of determinants, although turnover ratio is not significant for new funds. However, our concern in this study is the impact of incubation on the effectiveness of copycat funds. Therefore, to obtain the coefficients for new-minus-old funds, we add independent variables that are the new funds' dummies multiplied by independent variables. The impact of incubation can be captured by the coefficients of these new variables shown in the column of "New-Old." If there are any different determinants between new and old funds, the new-minus-old coefficients should be

significant. The coefficients in the last column are not significant at all, which implies that the determinants of new successful copycat funds are not notably different from those of old successful copycat funds. We conclude that there is no difference in the determinants of successful new and old copycat funds.

***** Insert Table 5 here! *****

5. Concluding remarks

This study investigates the impact of fund incubation on the effectiveness of copycat funds based on the set-up and holdings-disclosure rules and practices in China. Such incubation is an important issue for research because of the fast-growing fund industry. This study is the first to consider both incubation and copycat funds in the largest emerging market, China. We also identify the determinants of successful copycat funds through logit analysis.

The empirical findings are as follows. First, unlike the U.S., the overall findings exclude the possibility of successfully copying equity funds in China. Second, an advisory company's fund incubation makes it harder to free-ride on new funds than old funds. Third, incubation is generally undertaken for new funds in a bullish market so that copycat returns of new-minus-old funds have a negative correlation with market returns. Fourth, the effect of long Chinese Lunar Year holiday impairs the performance of primitive funds, consequently, copying is effective in January and February. Finally, logit analysis shows that copying is successful for those funds with low performance and low turnover ratios. This finding excludes the possibility of Verbeek and Wang's (2013) concern about free-riding on portfolios disclosed by past winning funds.

Although we study the impact of incubation on the effectiveness of copycat funds, we have not investigated how the incubation is undertaken and its impact on the volatility of new equity funds. We leave it as interesting future research.

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Table 1. Summary statistics

This table shows the number of funds, average fund return, and average TNAs at the end of each year. The portfolio holdings have been disclosed semi-annually since the end of June 2004. September (July) 2004 is the first month for the analysis because this study assumes a delay of 60 (0) days for holdings disclosure. Hence, the sample period of this study covers 112 months from September 2004 to December 2013. The average fund return for 2004 is calculated from September to December. The sample funds are divided into new and old funds. A fund is classified as a new (old) fund in the current month if its age is less than (greater than or equal to) 24 months.

Year	Numbers of funds			Average fund return (%)			Average total net assets (RMB million)		
	All	New	Old	All	New	Old	All	New	Old
2004	8	7	1	.87	.87	.69	1,052	1,063	974
2005	20	12	8	.34	.34	.37	1,329	1,399	1,225
2006	41	26	15	6.64	6.79	6.37	2,212	2,219	2,199
2007	89	56	33	5.76	6.06	5.06	12,767	13,210	12,015
2008	113	41	72	-4.00	-4.49	-3.33	5,423	5,791	5,214
2009	154	47	107	3.58	4.53	3.06	6,255	1,434	8,372
2010	201	61	140	.31	.68	.16	4,534	1,448	5,879
2011	252	64	188	-1.78	-2.21	-1.60	2,817	1,078	3,409
2012	311	72	239	.49	.60	.46	2,346	498	2,903
2013	333	39	294	1.13	1.74	.99	2,194	411	2,430

Table 2. Average performance of primitive and copycat funds [Unit: %]

This table shows the cross-sectional average monthly returns of primitive and copycat funds for all, new, and old funds according to each delay period. Portfolio holdings of June and December are disclosed semi-annually after a delay of 60 days. This study assumes a delay of 60 days (two months) for portfolio disclosure. For the purpose of diversity, this table also assumes delays of 30 and 0 day(s). After each delay period, copycat funds are formed. Time-series average returns of all primitive and copycat funds are averaged to calculate cross-sectional average returns for all, new, and old funds. Panels A, B, and C assume delays of 60, 30, and 0 day(s), respectively. Returns for primitive funds are calculated for the sample period matched to copycat funds. Returns for new primitive funds vary according to the length of delay because their recent portfolio holdings are not known at the beginning; therefore, so one and two observations (July and August, or January and February) are lost for delays of 30 and 60 days, respectively. However, returns for old primitive funds are the same across all delay periods because their ages are more than 23 months and their recent portfolio holdings are always known. Copycat fund returns are copycat portfolio returns minus trading costs. Trading costs are a brokerage fee of 0.05% plus sales tax of 0.1%. The t-statistics are in parentheses.

Funds	All	New	Old	New-Old
Panel A: 60 days's delay				
Primitive funds	.59 (12.39)***[a]	.70 (5.35)***	.61 (11.42)***	.09 (.66)
Copycat funds	.58 (15.04)***	.59 (4.23)***	.67 (13.08)***	-.07 (-.47)
Copycats over primitives	-.00 (-.16)	-.11 (-2.24)**	.06 (1.72)*	-.16 (-2.81)***
Panel B: 30 days' delay				
Primitive funds	.70 (14.11)***	.89 (7.38)***	.61 (11.42)***	.28 (2.10)**
Copycat funds	.62 (15.72)***	.72 (5.73)***	.60 (11.96)***	.12 (.92)
Copycats over primitives	-.07 (-2.56)**	-.17 (-3.54)***	-.01 (-.40)	-.15 (-2.62)***
Panel C: 0 day's delay				
Primitive funds	.69 (14.59)***	.96 (8.43)***	.61 (11.42)***	.35 (2.75)***
Copycat funds	.62 (15.63)***	.78 (6.59)***	.62 (12.11)***	.16 (1.24)
Copycats over primitives	-.07 (-2.89)***	-.18 (-4.51)***	.01 (.23)	-.19 (-3.67)***
Number of funds	333	333	294	NA[b]

a.. *, **, ***: statistically significant at 10%, 5% and 1%, respectively.

b. NA: Not available.

Table 3. Excess performance of copycats over primitives across years [Unit: %]
This table shows the average monthly excess returns of copycats over primitives for new and old funds across years. All copycat fund returns assume a delay of 60 days for holdings disclosure. Market returns in the last column represent the annual returns of S&P/CITIC stock index, calculated for all stocks listed on the Shanghai and Shenzen Stock Exchanges. The t-statistics are in parentheses.

Year	All	New	Old	New-Old	Market return
2005	.03	.00	.07	-.07	-11.70
	(.33)	(.01)	(.25)	(-.23)	
2006	-.43	-.50	.27	-.77	111.09
	(-1.68)	(-1.47)	(.33)	(-.86)	
2007	.94	.72	1.46	-.74	168.28
	(5.87)***[a]	(4.23)***	(5.33)***	(-2.29)**	
2008	-1.20	-.99	-1.25	.25	-63.15
	(-9.02)***	(-5.34)***	(-5.97)***	(.91)	
2009	.94	.11	1.42	-1.30	106.12
	(7.51)***	(.65)	(10.67)***	(-5.95)***	
2010	-.15	-.55	.04	-.60	-3.47
	(-3.43)***	(-.5.73)***	(.76)	(-5.37)***	
2011	-.29	.10	-.47	.57	-28.19
	(-6.54)***	(1.33)	(-7.47)***	(5.94)***	
2012	.38	.37	.38	-.01	3.91
	(11.21)***	(4.52)***	(6.58)***	(-.11)	
2013	-.03	-.39	.06	-.45	4.29
	(-.70)	(-3.16)***	(1.23)	(-3.39)***	

a. *, **, ***: statistically significant at 10%, 5% and 1%, respectively.

Table 4. Excess performance of copycats over primitives across calendar months [Unit: %]
This table shows the average monthly excess returns of copycats over primitives for new and old funds across the calendar months. All copycat fund returns assume a delay of 60 days for holdings disclosure. Market returns in the last column represent the average returns of the S&P/CITIC stock index, calculated for all stocks listed on the Shanghai and Shenzen Stock Exchanges. The t-statistics are in parentheses.

Month	All	New	Old	New-Old	Market
January	.12	.10	.18	-.08	2.70
	(.17)	(.15)	(.22)	(-.19)	
February	.55	-.17	1.04	-1.21	6.01
	(3.35)***	(-2.26)**	(4.70)***	(-4.97)***	
March	-.32	-.32	-.45	.14	-.89
	(-.59)	(-.83)	(-.56)	(.21)	
April	-.10	-.42	.26	-.68	4.36
	(-.17)	(-.85)	(.35)	(-1.58)	
May	-.25	-.60	-.08	-.52	1.55
	(-.34)	(-.86)	(-.09)	(-.92)	
June	-.96	-.86	-.98	.11	-4.83
	(-1.70)	(-2.24)**	(-1.22)	(.17)	
July	.57	.09	.78	-.69	4.25
	(1.01)	(.14)	(1.23)	(-1.19)	
August	.35	.71	.19	.51	-1.11
	(.63)	(1.10)	(.26)	(.77)	
September	.22	.01	.45	-.44	1.15
	(.69)	(.05)	(.95)	(-.92)	
October	-.19	-.07	-.23	.16	-1.19
	(-.36)	(-.21)	(-.28)	(.23)	
November	-.20	-.40	-.14	-.26	.92
	(-.48)	(-1.65)	(-.25)	(-.58)	
December	.61	.52	.62	-.10	3.10
	(1.36)	(1.50)	(1.05)	(-.17)	

a. *, **, ***: statistically significant at 10%, 5% and 1%, respectively.

Table 5. Determinants of successful copycat funds

This table shows the determinants of excess performance in regard to copying equity funds. Characteristic variables (available frequency) are as follows: net flow (quarterly), performance (monthly), TNAs (quarterly), turnover (semi-annual), standard deviation (monthly), and the number of holding stocks (semi-annual). To match the frequency of characteristic variables, we use semi-annual data. Returns of copycat funds are calculated with semi-annual holdings data assuming a delay of 60 days. The dependent variable is an indicator variable that takes 1 if the return of a copycat fund is greater than that of a primitive fund and 0 otherwise. The independent variables include net flow, excess return over benchmark, the log of TNAs (fund size), turnover, daily standard deviation of excess return over benchmark, the log of the number of holding stocks, yearly dummies, and family dummies. To obtain the coefficients for new-minus-old funds, we add independent variables that are the new funds' dummies multiplied by independent variables. The impact of incubation can be captured by the coefficients of these new variables represented by "New-Old." The coefficients are estimated using independent variables for the prior period.

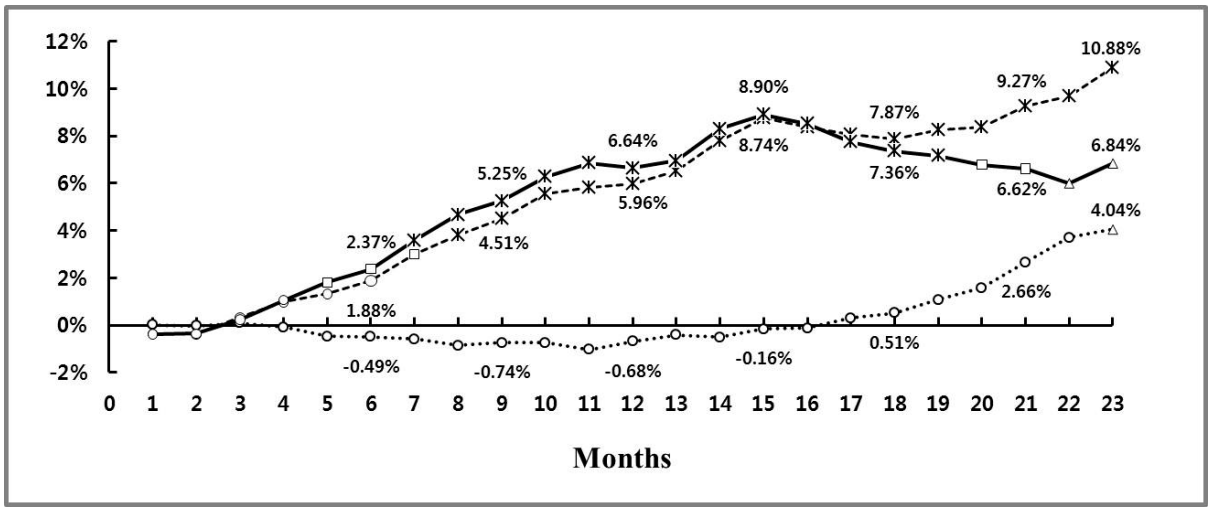
	All	New	Old	New-Old
Net flow	.02	.02	.08	-.06
	(1.42)	(.90)	(2.17)**[a]	(-1.58)
Performance	-2.95	-3.92	-2.70	-1.08
	(-5.28)***	(-2.64)***	(-4.24)***	(-.87)
ln(TNAs)	.00	-.11	.04	-.02
	(.02)	(-.67)	(.60)	(-.28)
Turnover	-1.47	-.93	-1.49	.55
	(-3.77)***	(-.88)	(-3.37)***	(.72)
Daily std. dev.	1.67	7.44	-4.91	2.75
	(.79)	(.12)	(-.20)	(.76)
ln(number)	.12	.08	.12	.09
	(.91)	(.29)	(.82)	(.34)
Yearly dummies	Yes	Yes	Yes	Yes
Family dummies	Yes	Yes	Yes	Yes
Adjusted R^2	.1438	.2930	.1580	.1464
Observations	2,236	408	1,828	2,236

a. *, **, ***: statistically significant at 10%, 5% and 1%, respectively

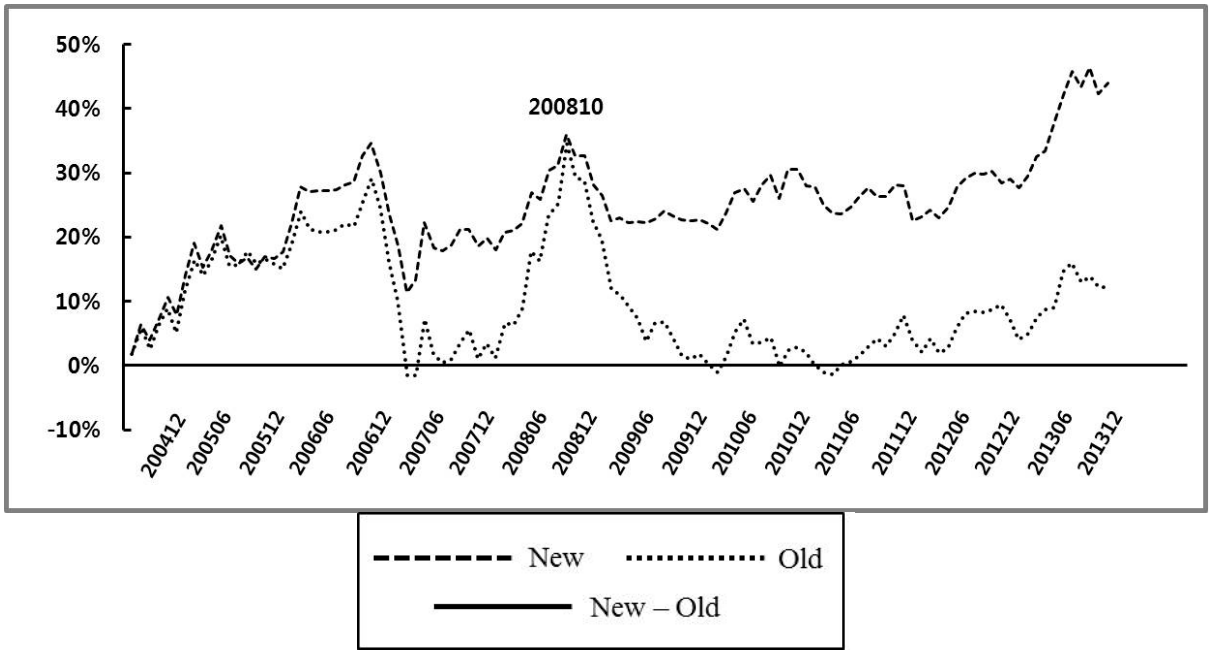
Figure 1. The cumulative excess returns of new and old funds over benchmark

This figure shows the cumulative excess returns of new and old funds over benchmark. The benchmark returns are 80% of S&P/CITIC stock index returns plus 20% of S&P/CITIC bond index returns. Panel A presents the cumulative excess returns over benchmark since the establishment of the new fund. Panel B presents the cumulative excess returns over benchmark from 2004 to 2013.

Panel A: The cumulative excess returns over benchmark since the establishment of the new funds



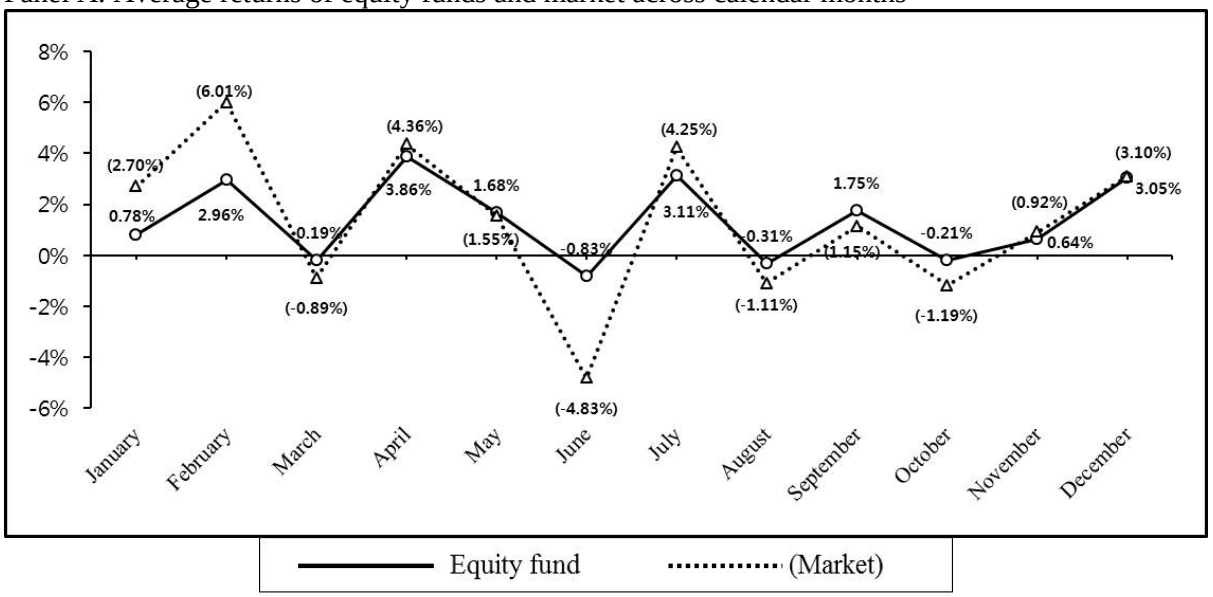
Panel B: The cumulative excess returns over benchmark from 2004 to 2013



주) Δ, □, *: statistically significant at 10%, 5% and 1%, respectively.

Figure 2. Average returns of equity funds, market, and benchmark across calendar months
This figure shows the average returns of equity funds, market, and benchmark across calendar months. The market returns are the rate of change of the S&P/CITIC stock index. The benchmark returns are 80% of the S&P/CITIC stock index returns plus 20% of the S&P/CITIC bond index returns. Panel A presents the average returns of equity funds and market across calendar months. Panel B presents the average returns of equity funds and benchmark across calendar months.

Panel A: Average returns of equity funds and market across calendar months



Panel B: Average returns of equity funds and benchmark across calendar months