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## Do screening approaches matter in mutual fund investments?

### Abstract

The authors argue that how to screen mutual funds to derive satisfactory returns would be a worthwhile topic for investigation, since investors seem unsatisfied with their returns on mutual fund investments as their expectations. However, the screening approaches related to mutual funds seem rarely explored in the relevant studies. We then explore whether employing three screening approaches employed in Taiwan would enhance the profitability of mutual fund investments. This study also takes the lump sum (LS) and dollar-cost average (DCA) investments as well as the take-profit and stop-loss mechanism into account due to the concern of investors' behaviors. The results reveal that these screening approaches would matter for Taiwan mutual fund investments, LS investments yield better results than DCA investments, and mutual fund investments without take-profit and stop-loss outperform those with take-profit and stop-loss. These findings indicate that these screening approaches, LS and DCA, and take-profit and stop-loss mechanism would matter for mutual fund investments.

**Keywords:** mutual funds, screening approaches, dollar-cost average.

**JEL Classification:** G11, G14.

### Introduction

We argue that how to screen mutual funds to derive satisfactory returns would be a worthwhile topic for investigation, since investors seem unsatisfied with their returns on mutual fund investments. After surveying relevant literature, we reveal that the security selection and market timing abilities of fund managers (Grinblatt & Timan, 1992; Daniel et al., 1997; Wermers, 1999), mutual fund performance (Indro et al., 1999; Chan et al., 2002; Fama and French, 2010), performance persistence (Lakonishok et al., 1992), and lump sum (LS) and dollar cost average (DCA) investments<sup>1</sup> (Williams & Bacon, 1993; Rozeff, 1994) have been widely explored. However, screening mutual funds by appropriate approaches seems rarely explored in the relevant study.

In the relevant studies, as for the security selection and market timing abilities (Treynor & Mazuy, 1966; Henriksson & Merton, 1981), we reveal that the security selection abilities seem rarely revealed in mutual fund investments (Chang & Lewellen, 1984; Becker et al., 1999). However, Umanaheswar (2000) finds that most of mutual funds have market timing abilities over the period 1987-2000 regarded as the bull market period. Moreover, market timing abilities are revealed for mutual fund investments in several developing countries, such as China (Xu, 2005) and Turkey (İmişiker and Özlale, 2008).

With regard to mutual fund performances, Treynor (1965) evaluates the mutual fund performance by assessing the ratio of the mean risk premium against the systematic risk of a mutual fund. Sharpe (1966) proposes that investors should consider both systematic and unsystematic risks. Subsequently,

Jensen (1968) measures mutual fund performances by employing the benchmark according to the capital asset pricing model. In addition, Indro et al. (1999) indicate that large-scale mutual funds would benefit fund managers, thereby enhancing mutual fund performance. However, Chen et al. (2004) demonstrate that fund scale negatively affects the performance of future fund.

Furthermore, Rodríguez (2007) shows that mutual fund performance is related with the region where the investment is made. Rodríguez demonstrates that fund managers outperform the benchmark of Latin American region. In addition, the average performance of actively managed U.S. equity funds is close to that of the market portfolio (Fama and French, 2010).

Concerning the persistence of mutual fund performance, Grinblatt and Titman (1992) disclose that performance persistence would be existed in some mutual funds. Brown and Goetzmann (1995) find that most winners are repeat winners, and most losers are likewise repeat losers. Carhart (1997) shows that some top funds have maintained their rankings better compared with the academicians' random expectations. Cremers and Petajisto (2009) demonstrate that highest active funds have strong performance persistence, which outperforms their benchmarks. By contrast, Droms and Walker (2001) show the absence of long-term performance persistence in most of the equity funds, but also disclose short-term performance persistence. Moreover, Bollen and Busse (2005) reveal that the top docile funds generate statistically significant abnormal returns. However, they fail to reveal consistently the short-term performance persistence. Similarly, Busse et al. (2010) show that only a modest performance persistence exists in some mutual funds.

In addition, LS and DCA investments are often employed in mutual fund investments. Constantinides (1979) shows that investors engaged with the DCA

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<sup>1</sup> LS refers to a one-time payment for the entire payment due. DCA is the investment of a fixed amount of money at regular intervals.

investments can minimize risks while investing in an unstable market. Malkiel (1999) and Dubil (2005) suggest that DCA investments can reduce risks even during improper investing periods. Edleson (1988) finds that DCA investments could increase long-term returns. However, Williams and Bacon (1993) and Rozeff (1994) find that the performances of LS investments are better than those of DCA investments.

Studies on mutual funds including those on security selection and market timing abilities, mutual fund performances, mutual fund performance persistence, and LS and DCA mutual investments are rather abundant in the relevant studies. We argue that mutual fund performances and performance persistence are likely taken into accounts by investors for screening mutual funds. However, how to screen mutual funds thought fully like screening criteria listed and screening approaches adopted seem rarely explored in the relevant literature.

In fact, investors would concern how to make profits in mutual fund investments, but many investors, especially individual investors, are lack of know-hows related to mutual fund investments. In fact, we argue that market participants not only take the performance and risks of their targeted mutual funds, but also the grade of mutual funds invested into account. In fact, we also reveal that the mutual funds graded by Morningstar and the Morningstar database are employed in the relevant studies (Elton, et al., 2001; Cici, Gibson, & Merrick, 2011; Sialm & Starks, 2012).

As a result, we suggest that these market participants might adopt the screening approaches recommended in Taiwan, since the risks and performance are seriously concerned by these screening approaches. However, we find that how to employ screening approaches to achieve better performance seem rarely explored in the relevant studies. Thus, in this study, we explore whether investors are able to have better performance by using the screening approaches employed in Taiwan<sup>1</sup>.

Moreover, although these approaches are not well-known approaches, we argue that these approaches might provide valuable information for investors in mutual fund investments. In fact, although these approaches are employed in Taiwan, these approaches seem rarely explored in the relevant studies. In addition, we argue that these screening approaches might be worthwhile for investors in their investments, if these screening

approaches proposed in Taiwan do matter in mutual fund investments.

Thus, we explore three mutual fund screening approaches applied in Taiwan, namely, the 4433 approach proposed by academic scholars, the 54321 approach proposed by a commercial bank, and the approach proposed by an investment institution. In this study, we endeavor to make our researches design in accordance with investors' behaviors. In reality, investors might adopt make-profits (cut-losses) strategies due to concerning subsequent risks occurred for their investments, while the performance of their investment is far beyond (below) their expectations. Furthermore, as for the mutual fund investments, lump-sum and dollar cost investments are adopted by investors in the real world as well.

Therefore, we explore whether investors could generate higher returns by using these screening approaches, employing the LS and DCA investments, and taking the take-profit and stop-loss concerns in mutual fund investments. In fact, these concerns mentioned above seem seldom taken into account in all in the relevant studies. Thus, we hope this study would contribute to the existing literature through this exploration in this study.

In this study, several impressive findings are obtained. First, the LS investments outperform DCA investments. Second, the mutual fund performances without take-profit and stop-loss are better than those with take-profit and stop-loss, especially in long-term investments. Third, the 4433 approach exhibits better performance in the long-term investments without take-profit and stop-loss, but the 54321 approach performs well in short-term investments with take-profit and stop-loss concern. Thus, investors might take the results revealed into account in mutual fund investments. Besides, the performance of mutual funds selected by these screening approaches seems to be considerably higher than that the benchmark, Taiwan stock index.

This paper is organized as follows. Section 1 introduces the data and mutual fund portfolio. Section 2 presents the empirical results and analyses. Final Section puts forward the conclusions.

## 1. Data and mutual fund portfolios

**1.1. Mutual funds in Taiwan.** Taiwan has a well-developed local fund industry which also works with offshore funds. Local sites offer funds that invest in the Taiwan stock, bond and money markets and also funds that invest worldwide. In fact, money market funds have been a particular feature, and very popular with retail investors, as an alternative to deposit accounts with banks, which might result from tightly controlled currency and low deposit

<sup>1</sup> These three screening approaches including the 4433, 54321 and institution approaches would be introduced in detail in the context.

rates at banks, leading investors to be attracted to higher rates available via the funds. Furthermore, while the local funds market is primarily used for domestic investing, it is notable that there are increasing numbers of global fund managers that also offer local fund choices in Taiwan. This can be expected to increase in the next few years, which would enhance the further development of a local fund management industry.

**1.2. Data sources and sample selection.** Data are obtained from the Securities Investment Trust and Consulting Association, the CMoney Financial Analysis website<sup>1</sup>, and the FundDJ website<sup>2</sup>. We collect the open-end equity funds issued in Taiwan from January 1997 to December 2008. Owing to the required prior five-year data, those of 1997-2001 are taken into account for the 4433 approach. We regard the five years before 2002 as the reference for selecting mutual funds. We present the Net Value (NV) and Net Value Returns (NVR) for the mutual funds of the 2002-2008 data. Due to concerning the bench for measuring fund performance, we then choose equity funds sold in Taiwan as our samples in this study. However, there are about 160 local equity funds less than developed countries in Taiwan because of the scale of Taiwan mutual fund markets. As a result, we include all domestic funds issuing in Taiwan without concerning the equity funds styles and investment class due to the sample concerns as mentioned above.

**1.3. Screening approaches introduced.** Market participants would like to make profits by mutual fund investments, but many investors, especially

individual investors, are lack of knowledge about how to invest in mutual fund investments. In fact, investors would concern the risks born in their investments, so mutual fund investments seem to be welcomed by investors due to diversification concerns incorporated in mutual fund investments. In addition, some market participants would concern the historical performance of their targeted instruments, read how to select mutual funds in websites, and join the investment conference held by the financial institutions in Taiwan.

As a result, we suggest that investors might adopt the screening approaches suggested in Taiwan, since the concern of risks and performance are taken into account by these screening approaches. As we further survey the relevant literature, we also find that the mutual funds graded by Morningstar and the Morningstar database are widely employed in the relevant studies (Elton et al., 2001; Cici, Gibson, & Merrick, 2011; Sialm & Starks, 2012), but we still doubt whether the mutual funds with higher Morningstar grade would have better performance.

However, we find that the issue, how to screen mutual funds by using appropriate screening approaches would have better performance, seems rarely explored in the relevant studies. Thus, we investigate whether investors would have better performance by employing three screening approaches suggested in Taiwan, and we wish that this study might expand the territory of relevant studies. Thus, we introduce these screening approaches employed in Table 1.

Table 1. Mutual fund screening approaches

Criteria	Approach	Academic scholars 4433 approach	Commercial bank 54321 approach	Investment institution Institution approach
Net value return (NVR)		(1) Top 1/4 ranking on 1, 2, 3, 5 year(s) performance (2) First 3-month and first 6-month performance on top 1/3 rankings	(1) Top 1/5 ranking on 6 months performance (2) 1-month performance on top 1/4 rankings	Top 1/3 ranking on 1, 3, 6, 12, 24 month(s) performance
Beta		None	None	$\beta$ value > 0.5
Sharpe ratio		None	None	Top 10 sharpe ratio
Redeem		None	To redeem fund performance of the last 1/3 rankings	None

Note: The performance ranking is measured according to the net value return (NVR), which is calculated as  $NV(t)/NV(t-1)-1$ , where net value is abbreviated as NV in this study. The beta would be derived by setting the daily mutual fund return as dependent variable as well as market returns as independent variables for a regression model. The Sharpe ratio is calculated as  $(R_i - R_f)/\delta$ , where  $R_i$  is individual mutual fund return,  $R_f$  is risk free interest rate, and  $\delta$  is standard deviation. In this study, we employ a monthly interest rate of Bank of Taiwan as the risk-free interest rate.

As for these screening approaches, we find that historical performance would be seriously concerned by these screening approaches. In addition, the factor like beta is concerned in the approach proposed by an institution, and the redeem concern is taken into accounts in the approach proposed by a commercial bank in Taiwan.

In addition, regarding to the logic behind these screening approaches, we argue that the previous performance of these equity funds plays an important role in these approaches, which might result from the wisdom of "history might repeat itself". Besides, it will be easy to persuade market participants to buy the funds with excellent

<sup>1</sup> <http://www.cmoney.com.tw>.

<sup>2</sup> <http://www.funddj.com.tw>.



performance in the past. As a result, these screening strategies put stress on the record in term of the performance of their screening bonds. In addition, the risks and even redemption issue are also taken into account for some screening approaches.

Table 1 shows that the NVR, beta, and Sharpe ratio are important indices for screening mutual funds, as indicated by the selection criteria of these three approaches. This study chooses the top five<sup>1</sup> mutual funds according to the ranking of NVR. Fama et al. (1969) disclose that  $\beta$  values are unstable because the systematic risk might change at any given time. Evans and Archer (1968) and Latane (1973) find that the  $\beta$  values in the portfolio likely decline if the portfolio includes more securities. In addition, investors tend to examine the past performance before investing in mutual funds as well. For example, Barber et al. (2000) find that investors would consider past performance, particularly the strong one, when selecting mutual funds. Lynch and Musto (2003) propose that investors consider the previous NVR and Sharpe ratio values as reference.

In addition, we argue that the screening criteria for these approaches are based on previous performance; however, we argue that mutual fund performance does not seem to persist in a way that investors can benefit from an ex-ante identification of real investment skill by observing past performance. Thus, the above concern is another motivation for exploring whether these screening approaches suggested in Taiwan would matter for mutual fund investments.

Table 1 reveals that the NVR, Sharpe ratios, and  $\beta$  values are considered by these approaches. For example, the 4433 approach proposed by academic scholars selects the top 1/4 ranking funds according to the prior one-, two-, three-, and five-year performances, and subsequently selects the top 1/3 ranking funds in accordance with the prior three- and six-month performances. The approach proposed by investment institutions is concerned with the Sharpe ratios ranking of the top half of the funds and with the  $\beta$  values greater than 0.5. The 54321 approach proposed by commercial banks takes redemption into consideration.

Table 2. Summary statistics

This table reports the mean, standard deviation, maximum and minimum for the net value (NV) at the end of the year, and year net value return (NVR) for the domestic equity funds.

Variable	Obs.	Mean	Median	Std. dev.	Min	Max
Panel A: net value (NV)						
2002	145	11.0584	7.9	21.5545	3.51	253.17
2003	155	13.6139	9.55	27.3040	4.17	334.04
2004	160	13.6491	9.805	28.2052	3.82	351.45
2005	163	19.5848	13.36	46.0285	4.6	583.97
2006	168	22.7363	15.515	52.2799	5.26	672.99
2007	164	25.1498	17.565	54.4745	5.77	689.64
2008	161	13.3129	9.26	28.6201	2.99	357.4
Panel B: net value return (NVR)						
2002	145	-0.2145	-0.2291	0.0997	-0.3977	0.1271
2003	155	0.2399	0.2313	0.0959	-0.0540	0.5442
2004	160	0.0067	-0.0028	0.1173	-0.2485	1.080
2005	163	0.4093	0.4116	0.2052	-0.1246	1.050
2006	168	0.1806	0.1752	0.0944	-0.0316	0.4774
2007	164	0.1036	0.1066	0.1065	-0.3360	0.4218
2008	161	-0.4691	-0.4758	0.0714	-0.7039	-0.2090

In Table 2, Panel A reveals that NV increases from 2003 to 2007, but drops sharply in 2008 because of the stock market crisis in 2008. Panel B shows that the NVRs exhibit positive returns from 2003 to 2007. The highest average NVR is indicated in 2005, a result of the economic recovery from the recession after the 2000 Tech Bubbles. The lowest average NVR is indicated in 2008, a result brought about by the stock market crisis.

<sup>1</sup> The top five mutual funds selected according to the wisdom of umbrella funds, because the Taiwan umbrella mutual fund should not hold less than five mutual funds due to the regulation of Taiwan authorities.

#### 1.4. Construction of the mutual fund portfolio.

We employ the rolling holding period technique to retrieve more samples for these three screening approaches and to collect 72<sup>2</sup>, 60, 48, and 24 mutual fund portfolio<sup>3</sup> samples for one-, two-,

<sup>2</sup> We derive 72 one-year mutual fund performance samples by measuring the performance of the investing period from January 2002 to January 2003 as the first sample, February 2002 to February 2003 as the second sample, March 2002 to March 2003 as the third sample, ..., and December 2007 to December 2008 as the 72<sup>nd</sup> (i.e. the final sample).

<sup>3</sup> Mutual funds selected have to match the criteria of the approaches in Table 1; subsequently, the top five mutual funds are selected by ranking the previous performances of the open-end mutual funds issued in Taiwan.

three-, and five-year holding periods. We then evaluate the performance of mutual fund portfolio screened by these approaches in Table 3. In addition, we measure the performance by using the LS and DCA investments, and consider the take-profit, stop-loss, and neither take-profit nor stop-loss. Moreover, the compound interest<sup>1</sup> is accounted for by measuring the performance of

the redeemed funds until the end of the holding periods.

## 2. Empirical results and analyses

Table 3 presents the performance results with and without concerning take-profit and stop-loss for either LS investments in Panel A or DCA investments in Panel B.

Table 3. Performance of LS and DCA investments

Screening Approaches	Investment	Scholars	Banking	Index <sup>2</sup>
Panel A: LS investments	(institution)	(4433)	(54321)	
Panel A1: With take-profit concern				
One-year NVR	10.91%	8.37%	9.45%	
Two-year NVR	17.09%	21.14%	16.50%	
Three-year NVR	21.75%	18.12%	14.31%	
Five-year NVR	24.03%	18.15%	14.26%	
Panel A2: With a stop-loss concern				
One-year NVR	11.58%	6.88%	8.16%	
Two-year NVR	12.54%	9.63%	11.09%	
Three-year NVR	14.07%	8.45%	9.73%	
Five-year NVR	12.67%	11.55%	12.89%	
Panel A3: Without stop-loss and take-profit concern				
One-year NVR	15.15%	9.98%	10.31%	8.56%
Two-year NVR	26.87%	31.09%	26.77%	24.12%
Three-year NVR	68.68%	56.31%	28.84%	51.72%
Five-year NVR	79.18%	92.83%	24.03%	67.35%
Panel B: DCA investments				
Panel B1: With take-profit concern				
One-year NVR	6.52%	6.37%	8.14%	
Two-year NVR	13.89%	24.13%	16.70%	
Three-year NVR	23.02%	23.59%	15.58%	
Five-year NVR	36.16%	25.67%	15.68%	
Panel B2: With stop-loss concern				
One-year NVR	6.98%	5.04%	7.65%	
Two-year NVR	7.82%	6.79%	9.51%	
Three-year NVR	9.05%	4.61%	7.32%	
Five-year NVR	7.44%	8.65%	10.94%	
Panel B3: Without stop-loss and take-profit concern				
One-year NVR	7.41%	4.26%	5.37%	4.23%
Two-year NVR	10.96%	15.14%	16.46%	13.01%
Three-year NVR	35.50%	28.47%	18.11%	22.14%
Five-year NVR	34.06%	47.15%	20.94%	34.49%

Note: One-year performances are set as short-term performance, two- and three-year performances are set as medium-term performance, and five-year performances are set as long-term performances in this study.

Table 3 shows that in general, LS investments are better than DCA investments. The performances without take-profit and stop-loss<sup>3</sup> are better than

those with take-profit and stop-loss, and the performances with take-profit are better than those with stop-loss.

<sup>1</sup> The interest rate employed is the one-year deposit interest rate of Bank of Taiwan.

<sup>2</sup> We measure the performance of Taiwan weighted stock index performance including the one-, two-, three-, and five-year performances for LS and DCA investments, which are regarded as the benchmark of mutual fund performance. In addition, by employing pair tests, we reveal that most of the results revealed by these approaches are different from those shown the benchmark, i.e., the return of the market.

<sup>3</sup> The performances without take-profit and stop-loss are much better than those with take-profit and stop-loss; furthermore, we increase the take-profit and stop-loss level from 10% and 5% to 20% and 10%, respectively. Results with increased levels of take-profit and stop-loss are similar to those without the increase.

Panel A of Table 3 shows the performances of the screening approaches. The 4433 approach shows excellent performance for the five-year holding period (92.83%) compared with the 54321 approach (24.03%).

The 4433 approach displays excellent performance in DCA investments (47.15% in the five-year holding period) compared with the other approaches. Although the 54321 approach did not exhibit excellent performance, it attains better performance in the one-year holding period while investing mutual funds with take-profit and stop-loss.

## Conclusions

This study investigates screening mutual funds with a higher likelihood for better performance. By employing three screening approaches proposed by academic scholars, a commercial bank, and an institutional investment in Taiwan, we examine the mutual funds issued by Taiwan Investment Trust Corporations, and measure the effectiveness of three screening approaches in several dimensions including the LS and DCA investments, different holding periods, and take-profit and stop-loss concerns. Then, several remarkable results are obtained as follows.

First, the LS investments outperform the DCA investments consistent with the results obtained by

Williams and Bacon (1993) and Rozeff (1994). However, investors seem to prefer the DCA investments instead of the LS investments different from our cognition. We argue that the results are caused by that investors often use the LS investment in bull markets, but employ the DCA investment regardless of either bull or bear markets. Second, investing in a mutual fund portfolio without take-profit and stop-loss is better than investing in a mutual fund portfolio with take-profit and stop-loss, indicating that mutual fund investments with take-profit and stop-loss might not be appropriate, which might result from the upward trends shown in the stock market. Third, the performance of DCA investments seems overstated, which is consistent with the results of Malkiel (1995) and Carhart et al. (2002). However, the results of DCA investments are different from those of LS investments, which is similar to that of Hendricks et al. (1997). Fourth, the 4433 screening approach performs well in the five-year holding period. The 54321 screening approach with take-profit and stop-loss concern is recommended for one-year investments. Therefore, these screening approaches are important in mutual fund investments, an observation that is rarely emphasized in relevant literature. This is a concrete contribution to existing literature.

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