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Market timing and unit trusts: can you beat the market?

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This article reports the results of an investigation into the level of predictive accuracy required to benefit from a market-timing strategy using unit trusts as the investment medium. Three unit trusts within the same management company were used as the assets between which a market timer could switch his or her investment. Switching would depend on the timer's forecast of which of the three investments would produce the best returns in the forthcoming period. Remaining within the family of trusts managed by a single company kept the transaction costs to a minimum. Investments could be made in a general equity, a resources or an income unit trust. As attractive as the potential returns from market timing within a family of unit trusts might appear to be, the levels of predictive accuracy required to beat a buy-and-hold strategy with certainty were found to be extremely high (of the order of 80%). In addition, much of the benefit from timing depends on being in the highest yielding asset for a small, but specific number of periods. Therefore not only does one require a high level of predictive accuracy, but it is important to be correct in the key periods when most of the return above the buy-and-hold is earned.

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'Expert knowledge is required to know when to time the entry and exit from unit trusts ... Not all unit trusts are the same' (Typical advertizing material in the financial press).

Introduction

According to Fama (1972) superior investment performance may be the result of either forecasts of price movements of individual securities (selection ability or micro-forecasting) or forecasts of price movements of the general market as a whole (timing ability or macro-forecasting). This article reports the results of an investigation into the level of predictive accuracy required to benefit from a market timing strategy using a stable of unit trusts as the investment medium. The ability of an investor to select the best performing stable is not at issue here.

There are many definitions of market timing, some narrower than others, but essentially, market timing involves the active participation of investors in running their portfolios, as opposed to a passive investment strategy where the investors simply buy-and-hold their shares. Market timing thus focusses primarily on a short-term time horizon, as opposed to a buy-and-hold strategy, which reflects the long-term expectations of investors.[1]

Market timers manage investments by moving between various classes of assets to reduce investment risk and/or increase performance. The returns earned by a market timer have the potential to far exceed those of the buy-and-hold investor. However, many writers (e.g. Sharpe, 1975) are of the opinion that market timing is a difficult if not impossible task to accomplish, because the idea of timing assumes a predictive ability regarding future market movements. Treynor (1980) observed that no-one can call market turns with anything approaching certainty, and, after taking into account transaction costs, an incorrect prediction can cost the investor dearly.

The efficient-market hypothesis is an important concept in the area of market timing, albeit a controversial one, because it implies that predicting market swings should be at least as difficult as distinguishing those shares which will produce abnormal returns. The consequences of an efficient market are that market timers would be precluded from achieving above average results because their market expectations would be shared by others, who together form the market. Such expectations would therefore already be reflected in the share prices.

Thompson & Ward (1994) reviewed the accumulated empirical evidence on the efficiency of the Johannesburg Stock Exchange (JSE) and concluded that the JSE is probably semi-strong efficient for the well traded shares. They raised the issue of whether this in fact meant that there were timing opportunities in the form of abnormal price behaviour on the JSE or whether the best policy for the normal investor is to follow a buy-and-hold strategy with a well diversified portfolio. They reached the conclusion that the JSE was operationally efficient.[2] In such a market, market timing should therefore not, except for a small group of market specialists, lead to abnormal returns.

Prior research

Sharpe (1975) investigated the influence of the quality of timing predictions on the performance of a hypothetical fund managed with a market timing strategy on the New York Stock Exchange (NYSE), switching between the market index and T-bills. He reached the conclusion that gains from market timing are likely to be modest and also that the forecasts had to be accurate 83% of the time, before any profit could be made at all.

Ward & Stansfield (1980), following the same approach as Sharpe, but using the FT index on the United Kingdom stock market, reached the same conclusions.

Jeffrey (1984) also compared buy-and-hold strategies to market timing strategies with perfect forecasting abilities, for investments in T-Bills and the market index on the NYSE. He showed that potential losses in using a market timing strategy were twice the size of potential gains.

Jeffrey (1984) developed a 'football'-shaped graph, the boundaries of which represent a best and worst case scenario for returns associated with market timing with less than perfect predictive abilities. All possible outcomes for a timing strategy are contained between the two curved lines. He concluded that at least 75% predictive accuracy is required to be successful with a market timing strategy. These findings are consistent with those of Sharpe, once the different transaction costs used by the two researchers are taken into account.

Firer, Ward & Teeuwisse (1987) repeated the studies done by Jeffrey and Sharpe for the JSE, and concluded that a 70% accuracy rate is required in forecasting market moves to have an equal chance of gaining or losing relative to a buy-and-hold strategy, and an 87% accuracy rate was required for the return to always be above that of a buy-and-hold strategy.

Firer, Sandler & Ward (1992a) researched the rates of predictive accuracy required for an investor who used the All Gold Index to represent the high risk asset. The levels of accuracy required for an investor to beat the buy-and-hold return were found to be between 87% and 90%.

These studies all reached the same conclusion: it is extremely difficult to beat a buy-and-hold strategy by employing a market timing strategy, because the levels of predictive accuracy required (between 75% and 90%) are probably above the capabilities of the normal investor.

Firer *et al.* (1987) observed that the standard deviation of the returns was not an adequate measure of risk, as the timing process should decrease volatility as forecasting precision increases. They argued that the spread of potential returns for perfect and incorrect timing could be regarded as an adequate measure for comparing the risk of the different strategies.

They examined other measures of risk, such as the number of switches between alternative asset classes that would have to be made to achieve perfect timing, and the compression ratio devised by Jeffrey (1984). Certain holding periods offer much higher returns than others. If a wrong decision is taken for these specific periods, a return which may be worse than the buy-and-hold returns could well be the result. The compression ratio is defined as the ratio between the number of the above-mentioned holding periods (i.e. the n best periods which, if missed, would result in a below buy-and-hold performance) and the total number of holding periods. This ratio gets its name from the fact that 'most of the "positive action" is compressed into just a few periods' (Jeffery, 1984: 105).

It may be argued that the number of switches and the compression ratio are good indicators of the risks associated specifically with a market timing strategy because they have no relevance for a buy-and-hold strategy.

Linked to the accuracy levels required, the levels of risk involved in a market timing strategy were substantial. Both Firer *et al.* (1987) and Firer *et al.* (1992a) found that the ratio of the returns from a 100% incorrect strategy to the returns from a 100% perfect strategy were all greater than one, indicating that the potential for loss was greater than the potential gain from a market-timing strategy. They also found that the 'portfolio', on average, had to be changed in over 40% and 50% respectively of the periods studied. The more changes that are required, the greater is the possibility that the incorrect decision will be made.

The risks involved in a market timing strategy were therefore evaluated by previous researchers as being substantial, thus taking much of the glamour out of the potential returns from market timing.

Unit trusts as an investment vehicle

Unit trusts provide a way for the man or woman in the street to be able to invest relatively small amounts, and still benefit from the returns associated with holding a widely diversified portfolio of shares and investments, whilst keeping the risk at an acceptable level. They have in fact become a major investment medium in South Africa.[1]

The average weighted total return for the general equity trusts for the five years to 31 March 1994 was 18.4% (*The Association of Unit Trusts Yearbook*, 1994). This return was well in excess of the 13.6% inflation rate for the period.

During the past decade, a number of studies have focussed on the measurement of unit trust performance and the impact that timing decisions have on the returns achieved by fund managers (e.g. Biger & Page, 1993 & 1994; Jagannathan & Korajczyk, 1986; Lee & Rahman, 1990). However the timing abilities of unit trust managers are not the subject of investigation in this article.

Unit trust management companies offer attractive low cost switching facilities to investors in 'families of funds' under their control. This increases the potential attractiveness of a timing strategy within the unit trust sector.

The objective of this research was to answer the question: what level of market timing accuracy is needed by a unit trust investor who attempts to time the market by switching within a family of funds in order to improve his or her returns?

Research methodology

A similar methodology to that used by Firer *et al.* (1987) was followed for this research. The period chosen was the five years between July 1989 and June 1994, since before 1989 there were not enough unit trusts which had been in existence for a five-year period to allow for a meaningful study.

At the end of each review period, the assets of a portfolio can be changed, depending on the market timer's view of which asset will provide the greatest return. The assets used in this research were unit trusts from two different management companies, namely Guardbank and Standard Bank. Within each management company, three funds were chosen as the possible assets between which to perform the timing exercise. Only switches within a family of funds were considered, as the higher transactions costs incurred when switching between different families could have negated the potential benefits of timing.

Three types of funds, each having a different risk profile, were used in the study – income funds, the least risky, general equity funds, and specialist equity funds, the most risky. The unit trusts used were the Income Fund, the Growth Fund and the Resources Fund of Guardbank and the Income Fund, the Mutual Fund and the Gold Fund of Standard Bank.

A portfolio review period is the period during which the composition of the portfolio remains the same. At the end of the review period, a change of assets can be undertaken. Issues to be considered are the transaction costs of initial

investments, as well as those applicable to switching investments. As the review periods become shorter, so the incurring of transaction costs become more frequent.

It was decided to use monthly and quarterly review periods in this research. Yearly and semi-annual reviews were not considered because of the relatively short data history available and because it was felt that, realistically, market timers would review their portfolios on a more regular basis.

In all the calculations it was assumed that the value of the investment at the beginning of the period plus any income earned during the period would be reinvested in the next period. The return on unit trusts is determined by two factors – the capital appreciation and the income distributions. Capital appreciation is the difference between the opening price and the closing price of the units as published by the respective management companies. These values were obtained from I-Net. Income distribution is the income earned by a unit trust which is distributed either quarterly or half yearly, after deducting the service charge (maximum of 0.75% p.a. of the market value of the trust).

The income funds all have distributions on a quarterly basis, and the equity-based funds all have distributions on a semi-annual basis. For the purposes of calculating the holding period return, the distributions were recognized in the periods in which they occurred, and were not split between the periods to obtain an even return. The income data for the period under review was obtained from the relevant management companies.

The holding period return (HPR) for any given period was defined as:

$$HPR = [(\text{ending wealth}/\text{beginning wealth}) - 1]^* 100\%$$

Investors may well choose to hedge their decisions by spreading their investment across more than one asset at any point in time. However, in this study it was assumed that 100% of the portfolio was always invested in a single asset.

Transaction costs are one of the main determinants of the level of predictive accuracy required to make a market timing strategy profitable. These costs are incurred for unit trusts upon initial investment and in the event of a switch. The initial charge for an income fund is substantially different from the initial charge for an equity-based fund. The transaction costs used in this research are those obtained from the Association of Unit Trusts' published financial statements for the year ended 31 March 1994.[4]

The potential range of returns achievable through market timing was evaluated using a micro-computer spreadsheet. In order to calculate the maximum possible return from perfect timing, the asset with the highest return was chosen each period, thus emulating the behaviour of the investor who has perfect predictive abilities. The annualized compound average return, after switching costs, was calculated.

The returns obtained when forecasting ability is less than perfect were then established. For every period there are three possible returns, one for each of the funds. If the investor only incorrectly forecasts one of the periods, the final return from the timing strategy will depend on which period is the one in which the incorrect forecast is made. In some periods there will be minimal differences between the returns of the three assets, so the penalty for error is small. In other periods it may be correspondingly large. Thus a set of returns can be calculated based on making a single error.

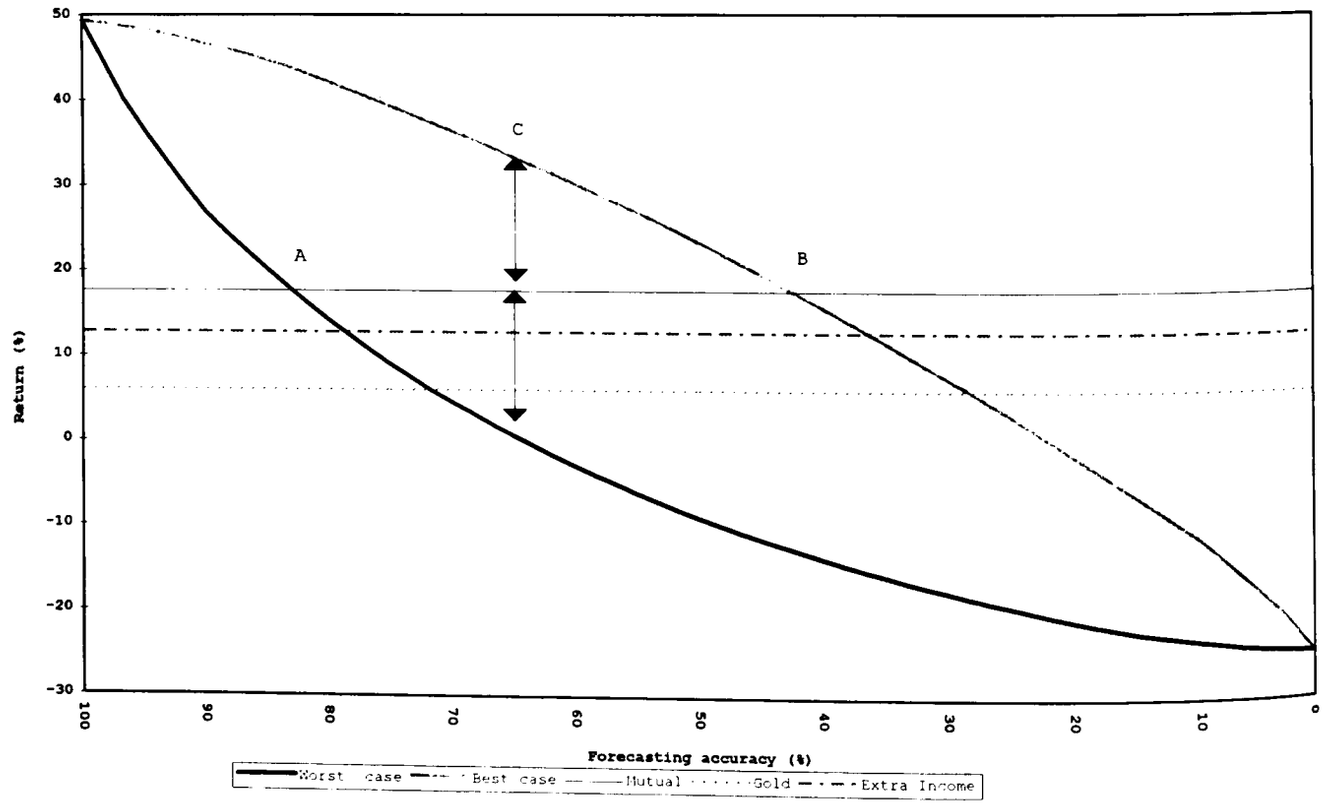

Figure 1 Football of returns: Standard Bank unit trusts

As the success rate decreases, all the possible outcomes will lie between two lines – the best case line, where the error(s) made have the least impact on final returns, and the worst case line, where the impact is greatest. A football-shaped graph of returns is thus generated. Figure 1 shows the football for the Standard Bank group of unit trusts when timing on a monthly basis.

Five levels of forecasting accuracy were calculated. The first two, which are self explanatory, were at 100% and 0% accuracy. The third (marked A on the figure) was the level above which the return from employing a market timing strategy is always higher than that associated with a buy-and-hold strategy for the asset with the highest overall return. The fourth level (B) was the level below which the return from employing a market-timing strategy was always lower than the return from buying and holding the highest yielding asset. Between levels three and four can be found a level (C) where there is an equal probability of gain or loss relative to buying and holding the asset with the highest return.

Superimposed on the football are the returns that could have been achieved with each of the three unit trusts via a buy-and-hold strategy.

The worst-best ratio, the number of switches required and compression ratios were also calculated as indicators of the riskiness of the timing strategy. The worst-best ratio is calculated as follows:

> (100% incorrect timing strategy return – buy-and-hold return of the best performing asset) divided by (100% correct timing strategy return – buy-and-hold return of the best performing asset).

A value greater than one implies that the downside resulting from a poor timing ability exceeds the upside available from perfect timing.

The number of switches required is indicative of the level of active management that was necessary to achieve perfect returns using timing. A large number of switches implies high levels of transactions costs.

Results

The returns achieved using a buy-and-hold strategy for each of the unit trusts are given in Table 1. From the table it can be seen that the five year buy-and-hold returns for the general equity funds are the highest at 18.9% and 17.7% compound annual growth rates respectively. The Standard Bank Gold fund showed the worst returns (6.0%), being less than half the returns of the two income funds and the Guardbank Resources fund. The riskier gold and resources funds performed poorly, largely because of the lacklustre performance of gold during the period of the study.

The return characteristics for timing within a group of three unit trusts under a common management company are presented in Table 2. For investors with perfect foresight, who are able to achieve 100% perfect timing, substantial increases in returns were achievable. Correctly predicting at the start of each period which of the three unit trusts would be the best performer, allowed for returns as high as 49.4% (after taking transactions costs into account) in the case of Standard Bank. Shorter holding periods resulted in higher perfect timing returns.

Table 1 Buy-and-hold returns for the six unit trusts (% pa)

Standard Bank		Guardbank	
Mutual fund	17.7	Growth fund	18.9
Gold fund	6.0	Resources fund	12.8
Income fund	12.8	Income fund	13.0

Interestingly for both management companies and holding periods studied, investors with 100% perfect timing would have found themselves invested in each of the three funds under consideration for approximately one third of the holding periods. This was despite the lacklustre performance of the two resources funds.

Conversely, a market timer who, in each period chose the worst of the three possible investments, would have obtained negative returns, substantially below those of a buy-and-hold investor in any of the three unit trusts.

The potential gain/loss spread column in Table 2 reflects the remarkable potential from a timing strategy, but also the consequences of getting it wrong. The more regularly the portfolio is reviewed, the greater the range between the best possible outcome and the worst.

The worst-best ratio was greater than one in all cases, showing that the potential loss from a timing strategy was always greater than the potential gain.

To quantify the level of predictive accuracy required by market timers operating in the environment of a group of three unit trusts under the control of the same management company, the 'football'-shaped graphs first described by Jeffrey (1984) were produced for each holding period (one or three months) for both Standard Bank and Guardbank. The Standard Bank graph using monthly review periods is shown in Figure 1.

Table 3 summarizes the key points of the graphs. The figures in brackets are the returns that would have been achieved in the absence of transactions costs. To be certain of achieving a return greater than that offered by the highest yielding asset (the general equity unit trust in both cases), forecasting precisions of the order of 79% to 83% were required (position A in the figure).

The forecasting precision percentages at which there will be certain loss relative to buying and holding the highest yielding asset were in the range 42% to 46%. Below these precision levels, the returns from a timing strategy would definitely be less than those of the buy-and-hold strategy (position B).

Finally the level of predictive accuracy at which there is an equal probability of gain or loss from employing a timing strategy relative to buying and holding the highest yielding asset is indicated by position C. As shown in Table 3, accuracy levels of around 65% were needed merely to give the market timer an equal chance of beating the buy-and-hold strategy.

The results show that there is little difference in required accuracy as the holding period is changed from one to three months.

In a world without transactions costs, the accuracy required to be certain of beating a buy-and-hold strategy would have been about five percentage points lower for monthly timing. The forecasting precisions required to have an equal chance

Table 2 Return characteristics for timing with different combinations of assets

Fund manager	Holding period (months)	100% perfect-timing return (%pa)	Difference between highest B&H return and 100% perfect timing (%pa)	100% incorrect timing return (%pa)	Difference between highest B&H return and 100% incorrect timing (%pa)	Potential gain– loss spread (%pa)	Worst–best ratio
Standard	1	49.4	31.7	(24.1)	(41.8)	73.5	1.3
	3	41.0	23.4	(16.3)	(33.9)	57.3	1.4
Guardbank	1	45.3	26.4	(16.0)	(34.9)	61.3	1.3
	3	34.3	15.4	(4.3)	(23.2)	38.6	1.5

Table 3 Required forecasting precision (%)

	Timing interval (months)	Certain incremental gain (%pa)		Certain incremental loss (%pa)		Equal probability of gain or loss (%pa)	
Standard Bank	1	82.8	(78.3)	42.3	(35.8)	65.9	(58.1)
	3	78.9	(76.7)	45.9	(43.3)	64.0	(60.9)
Guardbank	1	79.2	(74.1)	43.6	(36.8)	64.0	(56.2)
	3	81.0	(77.4)	43.7	(38.7)	65.9	(60.1)

of beating the buy-and-hold strategy were eight percentage points lower for the monthly review periods. The value for the certain loss strategy was seven percentage points. These figures are of the same order (six percentage points) as those found by Firer *et al.* (1987) when studying the required precision of timing between the All Share index and T-bills.

To achieve timing perfection, switches had to be made in 58% to 75% of the periods under review, depending on the review period and group of funds. The percentage of switches required to achieve perfect timing was larger for the quarterly than the monthly review periods. These results are presented in Table 4. It therefore appears that very active management (and the concomitant incurring of transactions costs) is necessary to achieve perfection using the timing strategy approach.

This may be contrasted with the results of earlier studies on timing using market indices during the period 1967–1989 reported by Firer *et al.* (1992a) where it was found that to achieve perfect timing using the JSE All Share index and T-bills, switches were required in 40% of the periods. This was the case whether monthly, quarterly or annual review periods were used. Firer *et al.* (1987) observed percentages of the order of 50% in their study.

A study of the compression ratios in Table 4 indicates that for both monthly and quarterly timing, if the best approximately 20% of the periods were missed, the returns would have dropped below those of a buy-and-hold strategy.

For the quarterly (or monthly) review strategies over the five-year period of study, this figure of 20% implies that missing the best four quarters (or the best twelve months) would have resulted in a performance level below that of buying and holding the general equity fund. To achieve anything like the potential from the timing strategy, the timer must be right in these all important periods when the bulk of the superior gains are achieved.

Figure 2 shows the month-by-month returns for both the Standard Bank general equity fund and the perfect timing strategy within the Standard Bank group of funds. It can be seen that only a few periods within the perfect timing series make the major contribution to the return achieved by the perfect timer.

Firer, Sandler & Ward (1992b) reported compression ratios of 13% for both monthly and quarterly reviews. The lower the compression ratio, the more the overall return achieved is dependent on a small number of periods into which most of the action is compressed.

The two studies covered different, almost non-overlapping, time periods (1967–1989 and 1989–1994). The differences in compression ratios suggest that the best periods in the earlier study provided substantially higher returns than those in the present work. As unit trusts always hold a percentage of their investments in cash (they are required by law to hold a minimum of 5%), this could explain the different compression ratios observed.

The traditional measure of risk, the standard deviation of holding period returns, was calculated for the different strategies (see Table 5). The standard deviations for the 100% perfect timing returns were lower than for both of the specialist funds and higher than the standard deviations of the income funds (for both monthly and quarterly review periods). This pattern could have been expected, given the high riskiness of the specialist funds and the lack of volatility inherent in income funds.

Table 4 Switching percentages and compression ratios

Unit trust stable	Monthly portfolio review periods		Quarterly portfolio review periods	
	Switches	Compression ratio	Switches	Compression ratio
Guardbank	58%	21%	65%	20%
Standard Bank	68%	17%	75%	20%

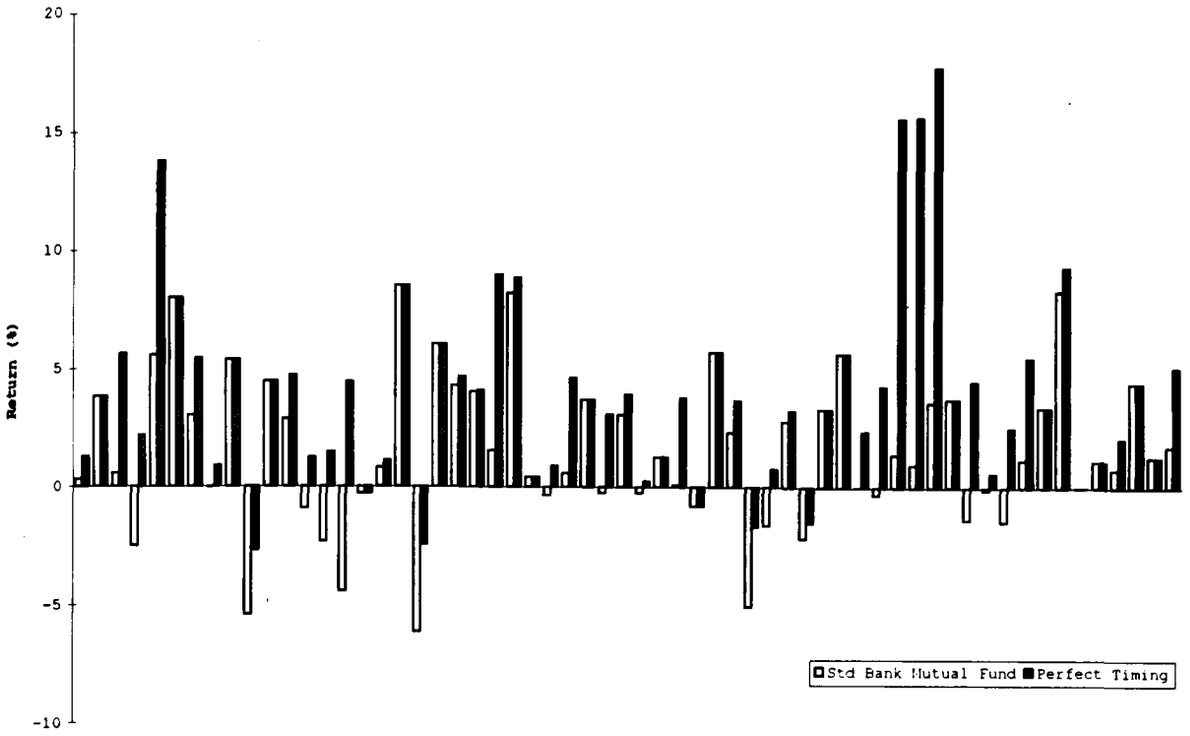

Figure 2 Monthly returns: Standard Bank Mutual Fund and 100% perfect timing

Table 5 Standard deviation of returns

	Standard Bank		Guardbank	
	Monthly	Quarterly	Monthly	Quarterly
General fund	3.27%	5.61%	3.90%	6.13%
Specialist fund	6.22%	14.57%	4.57%	9.42%
Income fund	2.41%	1.85%	2.97%	5.01%
Perfect timing	4.17%	9.45%	3.34%	6.63%

However, for both quarterly and for one of the monthly review periods, the standard deviation of the 100% perfect timing returns was higher than that of the general fund. In previous research carried out using the All Share index and T-bills as the assets between which switching occurred, the 100% perfect timing strategy always led to a lower standard deviation of holding period returns than the buy-and-hold the riskier asset strategy.

The explanation for this may be found by examining Figure 2. The timing strategy did indeed reduce the volatility of returns on the downside. However the very point of using a timing strategy is to take advantage of the good periods, whilst avoiding the bad ones. This was the case in Figure 2 where, in a number of periods, the upside was dramatically improved over the return available from holding the general equity fund.

In the case of the only fund/timing combination which produced a lower standard deviation than the 100% perfect timing, namely Guardbank general equity fund using monthly timing, a somewhat different pattern of returns was observed. The differences, on a month-by-month basis, between the Growth fund returns and the 100% perfect-timing returns were of the order of 20% smaller than the equivalent differences in the Standard Bank monthly data. The pattern of returns, in this case, led by chance to the standard deviation for perfect timing being smaller than that for buying and holding the general equity fund.

If the semi-variance[5] had been calculated in place of the standard deviation, one would have found a decrease in semi-variance in all cases when moving from a buy-and-hold to a perfect-timing situation. In situations such as those described in this article, the semi-variance of returns should provide a better measure of risk than the standard deviation of returns.

The four best performing periods in the monthly Standard Bank data (each with returns in excess of 13%) resulted from an investment in the gold fund, the riskiest of the three choices. When comparisons are made with previous studies, in which only two assets were used, the absence of a high risk asset such as the gold fund may have limited upside potential. This could have resulted, by chance, in an observed standard deviation for the timing strategy being lower than that of the buy-and-hold strategy, as was found previously. No inference can thus be drawn, using standard deviations, about the relative riskiness of timing *versus* buy-and-hold strategies.

Conclusions

As attractive as the potential returns from market timing within a family of unit trusts might appear to be, the levels of predictive accuracy required to beat a buy-and-hold strategy with certainty are extremely high.

For a naive market timer relying on the roll of a dice to make his or her selection of which the best performing asset will be in the next period, having three assets to choose from in each period, increases the probability of making the incorrect choice from 0.5 to 0.67 (similarly it decreases the chance of selecting the worst asset). This should imply that as the potential number of assets in which the market timer may be invested increases, it becomes more difficult to achieve a given level of predictive accuracy. It is equally true, of course, that with a choice of more assets, potential rewards also increase.

Accuracies of the order of 80% are almost certainly beyond the reach of the average private investor, and one can seriously question the ability of most professional fund managers to predict the next period's best performer. Such skills, if widespread, would seriously bring into question the efficiency of the market. Even for an equal chance of beating buy-and-hold, predictive accuracies of the order of 60% are required.

In addition, much of the benefit from timing depends on being in the highest yielding asset for a small, but specific, number of the periods. Therefore not only does one require a high level of predictive accuracy, but it is important to be correct in the key periods when most of the return above the buy-and-hold is earned.

This study has focussed on asset allocation within a group of unit trusts managed by the same company. Broadening the range of available assets would require movement of funds across management companies, thus leading to much higher transactions costs. The returns expected from such other funds would have to be much higher than the returns available within the group for the strategy to be worthwhile. It is doubtful that this is the case.

Notes

1. The comments of an anonymous referee are gratefully acknowledged.
2. An operationally efficient market was defined by Keane (1986) as a market which allows a small group of investors who are market specialists to profit from the inefficiencies of the market. These opportunities would, however, be limited to this group of individuals, as the market would correct itself before the majority of investors could earn super profits.
3. In March 1994, there were 60 unit trusts (with a total value of R20 billion) operating in South Africa, of which 24 were general equity funds, 21 specialist equity funds, and 15 income funds. Twelve of these funds had been launched in the year to 31 March 1994.
4. For an equity fund they consist of an initial charge and a compulsory charge. The initial charge, which is a maximum of 5%, consists of a 3% commission and a 2% administration fee. This reduces to a minimum of 3%, as the size of the investment increases. The compulsory charge consists of the 1% Marketable Securities Tax (MST), and a flat brokerage fee of 0.75%. The transactions cost applied in this research to an initial entry into an equity fund was 6.75%, being a 5% initial charge and a 1.75% compulsory charge. These are the charges applicable to small investments, and were chosen because unit trusts are investment vehicles for the small investor rather than for large, institutional investors. For an income fund the initial charge is a maximum of 1%. This consists of a 0.5% commission and a 0.5% administration fee. These two charges can be reduced to a minimum of 0.5%, as the rand value of the investment increases. Compulsory charges of stamp duty, brokerage and MST do not apply to income funds. However, in addition to the initial charge, 0.05% is charged by all unit trust management companies. Thus the transaction cost used for initial entry into an income fund in this research was 1.05%. The first switch from an income fund to an equity fund within the same management company carries a charge of 5.75%. This is done to prevent investors from investing originally in an income fund, and then switching to an equity fund, and only paying the 1% initial charge applicable to income funds. Any switches after the original one carry a charge of 1.75%, being the MST and other compulsory charges. To switch from an equity fund into an income fund, a fee of 0.05% is levied. A service charge is the regular charge deducted from the income accruing to the holders of the units to remunerate the company for managing their unit portfolio. It is calculated at a maximum of 0.75% per annum of the market value of the trust. This charge is deducted prior to distribution of the income accruing to investors and therefore was not explicitly taken into account in the research.
5. The semi-variance is a statistic which is defined as the expectation of the mean differences below the mean, squared.

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