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The effects of bull and bear periods on market timing strategies

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This study evaluates the performance of traditional timing, bull timing (holding the risk-free asset and buying call options to take advantage of expected market rises) and bear timing (holding the market index and buying put options ahead of expected market falls) strategies on the Johannesburg Stock Exchange during bullish and bearish market phases. Potential returns as well as the forecasting ability required to outperform the ALSI are calculated.

When the market is in a bullish phase, bear timing is the better strategy. However, in such a market, very high predictive accuracy (above 85 percent) is required from both bull and bear timers. In a bearish phase, however, bull timers perform better than bear timers. The predictive ability required of bear timers is of the order of 65 percent. For bull timers this required predictive accuracy drops below 50 percent, making it an extremely attractive strategy, provided the bear phases of the market can be predicted.

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Introduction

Investors are constantly looking for ways to outperform the market. One of the more controversial strategies is that of market timing. Market timing involves predicting how the market will perform over a period and then adjusting one's portfolio in a manner to either take advantage or protect the portfolio from the predicted market movement. Clearly no investor can predict market movements with anything approaching certainty but investors do not have to be correct 100 percent of the time in order to beat the market.

As a result a great deal of research has been carried out to determine exactly how proficient investors need to be at forecasting the market in order to exceed the market's return. This paper extends the literature on market timing by investigating the impact of bull and bear phases of the market on the efficacy of timing strategies. In addition, use is made of a newly published 76-year data set.

Literature review

In one of the first market timing studies, Sharpe (1975) discovered that, for the period 1929 to 1972, an 82 percent predictive ability was required to beat the Standard and Poors' Composite Index.

Clearly the return generated from market timing is dependent not only on investors' forecasting ability but also on which periods are incorrectly forecasted. This led Jeffrey (1984) to investigate the effect of incorrectly forecasting different periods at any given level of predictive accuracy. For the period 1926 to 1982 he demonstrated that perfect timing[1)], switching between the S&P 500 index and Treasury bills, would have achieved a return of 15,6 percent compared to the index's return of 9,3 percent. 100% imperfect timing, on the other hand, resulted in a return of –3,5 percent. He used this as a measure of the risk borne by market timers and illustrated that the maximum potential loss was about twice the maximum potential gain.

He also calculated that if investors held the index yet missed the 18 percent best years then their return would have dropped to that of an investor in Treasury bills. This demonstrates how few periods actually make up the entire positive return on the index and thus if market timers miss these few periods then their potential returns will be severely reduced. He observed that the sharp rises typically occurred after market declines indicating that if market timers

[1)]Under perfect timing, an investor is able to forecast with complete accuracy which of the two asset classes, equity or cash, will outperform in the coming period. Similarly, 100 percent imperfect timing implies that the investor forecasts incorrectly in every period.

remained bearish too long they would have missed these important upturns.

Firer, Ward and Teeuwisse (1987) repeated Jeffrey's (1984) study on the Johannesburg Stock Exchange (JSE) over the period 1967 to 1986. Using monthly review periods and switching between the All Share Index (ALSI) and Treasury bills perfect timing would have achieved a return of 49,0 percent compared to the buy-and-hold return of 20,2 percent. 100 % imperfect timing would have resulted in a return of – 28,8 percent.

They also showed that if investors missed the top 12,9 percent of periods they would not have been able to beat a buy-and-hold the index benchmark. This confirmed Jeffery's finding of the dependence of overall returns on a few important periods.

The presence of transactions costs impacts on the potential advantages from market timing. Due to their low cost, derivatives are now used extensively to create almost costless market exposures. The growth in the South African futures market led Waksman, Sandler, Ward and Firer (1997) to revisit the question of market timing through the use of options.

Option timing strategies can be split into two types, bull timing and bear timing. Bull timing involves constructing a portfolio of the risk free asset (Treasury bills) and purchasing call options on the index when a market rise is anticipated. Bear timing involves holding the market index and purchasing put options when a market decline is predicted, thereby protecting the portfolio from a fall in the market.

Waksman *et al.* (1997) found that perfect traditional timing generated a return of 43,2 percent compared to the market's 18,3 percent, whereas perfect bear and bull timing provided 38,1 percent and 35,4 percent returns respectively. However, perfect traditional timing's advantage was quickly eroded as forecasting ability fell. At the other extreme of 100 percent imperfect timing, option timing far outperformed its traditional counterpart.

In comparing the two option strategies bear timing was superior to bull timing both on a returns basis as well as on the basis of required predictive accuracy. This may have been the result of the market performing positively throughout the period under investigation. Consequently bull timers purchase more options thus adding to the costs of the strategy, whereas bear timers merely have to hold the underlying asset for the majority of the time.

A portfolio insurance investment strategy was also analysed. This involved holding the market portfolio and purchasing put options in every period. This approach would have achieved a return of 15,3 percent, which is 3,1 percent below that of the buy-and-hold strategy.

Market speculation produced similar results with a return of 15,0 percent. This strategy calls for the investor to hold Treasury bills and purchase call options in every period. Waksman *et al.* (1997) attributed the similarity of the results between the portfolio insurance and market speculation to put-call parity.

Sy (1990) repeated Sharpe's (1975) study for the period 1929 to 1988. Using selected time periods, he was able to highlight the fact that market timing is very sensitive to a few unusual periods. What his study suggested is that market timing may be well be more feasible during the periods that the market performs poorly.

Chua, Woodward and To (1987) demonstrated that being able to predict bull markets is far more important than being able to predict bear markets. They illustrated that even if investors were able to predict bear markets perfectly but had no ability to predict bull markets (random guess) then these investors' returns are likely to be inferior to that of a passive strategy. If investors were able to predict bear markets perfectly then they would need to predict at least 70 percent of the bull markets in order to have a better than average chance of outperforming a passive strategy.

Dumont de Chassart, Firer, Grantham, Hill, Pryce, and Rudden (2000) repeated Waksman *et al*'s (1997) study on the JSE for the period 1990 to 1998. During these years, Treasury bills outperformed the All-Share Index. For the three strategies analysed, the maximum potential gains and losses were lower than those observed by Waksman *et al* (1997). This was attributed to the poor performance of the equity market.

Contrary to Waksman *et al's* (1997) findings, during this period the bull timing strategy outperformed the bear strategy. However the most striking findings were the reduction in the required predictive accuracies. For traditional timing using annual review periods a predictive accuracy of only 63,3 percent was necessary for sure gain, 38,3 percent for equal chance and 21,5 percent for sure loss. Bear timing required similar predictive accuracies.

But it was bull timing that experienced the greatest reduction in required forecasting ability. For annual review periods sure gain only required a predictive accuracy of 39,9 percent, equal chance 18,7 percent and sure loss 9,0 percent. These required predictive accuracies are below that of a random guess and are the result of the 4,9 percent out performance of Treasury bills, which gives bull timers a 'cushion' in which forecasting errors can be absorbed before the return falls below that of the buy-and-hold return. The results of the Dumont de Chassart *et al.* (2000) study confirm the suggestion of Chua *et al.* (1987) that market timing during bull and bear periods may require differing levels of predictive accuracy.

The study reported in this paper extends the testing of Dumont de Chassart *et al.* (2000)'s hypothesis by using a

long time series of historical returns, grouping the returns into bullish and bearish market periods, and then conducting a market timing study to determine what effect, if any, the state of the market may have had on various timing strategies.

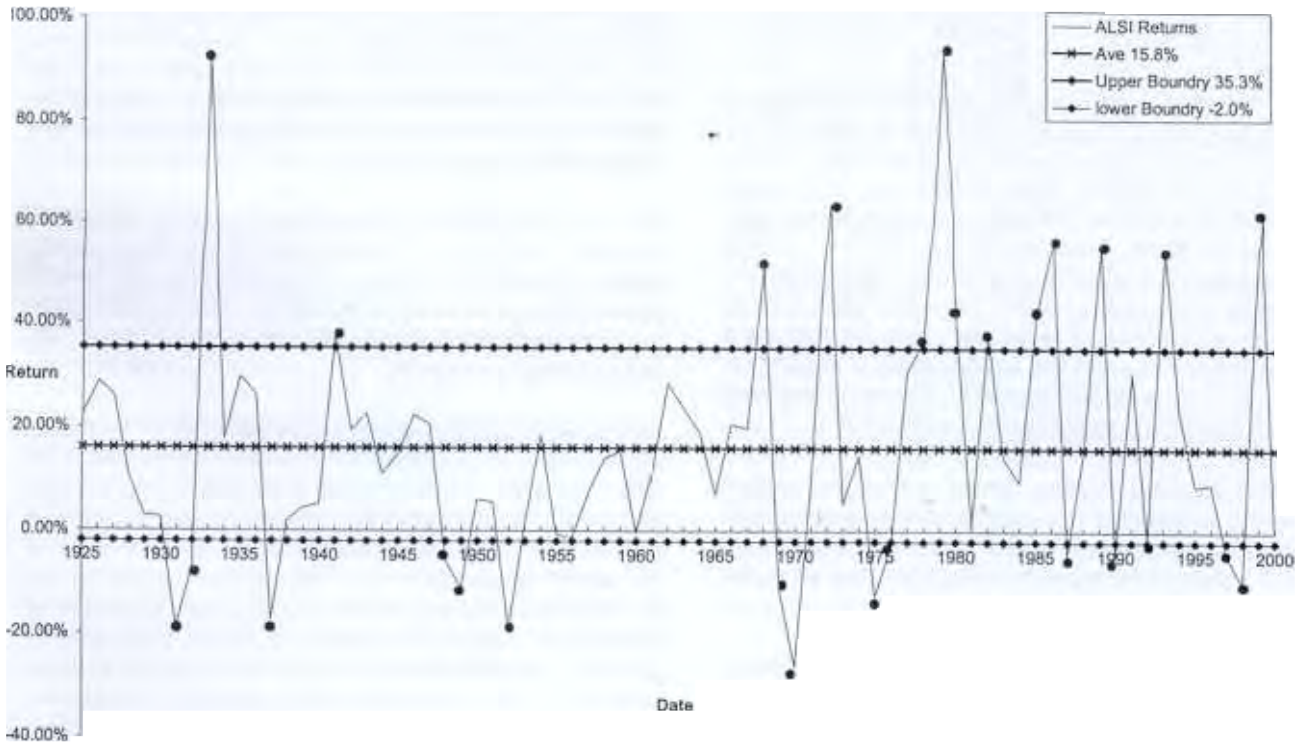
Methodology

The time series of returns was sourced from the Firer and McLeod (1999) study on the historical performance of equities, bonds and cash in South Africa updated to 2000 from the INet-Bridge database. It consists of 76 years of monthly returns on these assets[2)].

Use is made of Polakow's (2000) study on a memory effect on the JSE to split the market's performance over time into bull and bear trends. By using the Fisher-Tippet distribution he demonstrated that all annual returns greater than 35,3 percent or less than –2,0 percent can be considered to be extreme events and then discovered that there is a statistically significant mean reversion effect between such extreme events. That is to say that the market's returns tend to oscillate around its mean return with the extreme events occurring at the peaks and troughs. This can be seen in Figure 1.

The bull and bear periods are ascertained using the following process. The market's average return and extreme events as per Polakow (2000) are determined. Years in which the market mean reverted between two consecutive extreme events are identified. Between such points the majority of returns are either above or below the market average. Periods in which the majority of returns are greater than the average are labelled bull periods with the remainder regarded as bear periods.

Monthly intervals are used for timing decisions. It is therefore necessary to identify in which month the market switches from one condition to the other. This happens in the years in which the return intersects the mean market return as previously identified. During these years the index is either peaking or troughing. For the purpose of this study the month in which the market switches from one condition to another is deemed to occur when the index is at its maximum value for peaks or at its minimum value for troughs.



[2)]The equity returns, which include, dividends, indicate the returns of a large diversified portfolio of the available shares on the JSE. From 1978 the index consisted of the JSE Actuaries All-Share Index. Prior to that the RDM 100, and data from the Bureau for Economic Research at Stellenbosch University was used. The money market instruments' performance is tracked by constructing a portfolio of three 90 day Negotiable Certificates of Deposit (NCD's) purchased in successive months. The returns therefore represent the earnings of investors who hold a portfolio of three 90 day NCD's, each with a different maturity month.

Table 1 shows how the market is segmented into the bull and bear periods using the above methodology. Certain time periods have been omitted for the following reasons. The first two periods to be omitted were 1/25 to 4/28 and 8/00 to 12/00 because they appear at the ends of the time series and therefore there is no complete cycle to comply with the methodology. The period 2/62 to 1/65 was omitted because although the market mean reverted, it then hovered around the market average displaying no clear bull or bear trend. Lastly 2/90 to 1/93 is a very volatile period with the market oscillating around the mean but not breaching any of the extreme event criteria. Again the returns in this period did not show typical bull or bear tendencies but rather the market average. The effect of these periods is captured when the analysis is applied to the whole time period.

Table 1: Identified bull and bear periods

Bull Period	Months	Annual Return (%)	Bear Period	Months	Annual Return (%)
1/33 to 1/37	49	37,8	5/28 to 1/33	57	0,3
2/41 to 1/48	84	24,0	1/37 to 2/41	50	-1,6
1/66 to 4/69	40	39,1	1/48 to 1/62	169	2,5
1/72 to 6/73	18	56,5	4/69 to 1/72	34	-15,5
6/77 to 9/81	52	46,2	6/73 to 6/77	49	-2,0
6/82 to 8/87	63	45,8	9/81 to 6/82	10	-35,7
1/89 to 1/90	13	60,9	8/87 to 1/89	18	-8,3
2/93 to 12/95	35	25,8	12/95 to 1/99	38	1,6
1/99 to 8/00	20	34,1			

The three timing strategies, traditional timing, bull timing and bear timing are tested. Traditional timing involves investing in the index when a market rise is predicted and liquidating it and investing in the money market instruments when a fall in the market is expected. Transactions costs for traditional timing have not been included for the reason that different investors and institutions are exposed to different charges and the size of the portfolio may also influence the fee[3)].

Bull timing involves holding money market instruments continuously and liquidating a small portion to purchase call options on the index when a market rise is expected. This creates an exposure equivalent to being fully invested in the market.

Bear timing involves holding the index continuously and borrowing at the risk-free rate in order to purchase put options when a market fall is expected. Again the quantity of options purchased will create an exposure equivalent to liquidating the portfolio and investing the proceeds in money market instruments. This is commonly known as a protective put strategy.

[3)]Droms (1989), who conducted a similar market timing study, commented "on average transactions costs would reduce the theoretical annual returns to timing by about 0.5 percent to 2.5 percent per year, depending on the frequency of timing." He based his analysis on a 1 percent fee whenever a switch occurs.

Option premiums are required to evaluate the bull and bear timing strategies. The Black-Sholes option-pricing model, adjusted for dividends using the Merton adjustment, is used to estimate the option premiums since options did not exist for the majority of the time period investigated.

The returns generated by bear timing consist of two components namely the index and the options, if purchased. The return on the index, including dividends, is realised in each review period regardless of the timing decision or the markets performance. However the return on the option component is dependent on the performance of the market. Firstly the cost of the option is accounted for and then, depending on the performance of the market, the option will either mature in- or out-of-the money. If the option matures in-the-money then the return gained will be equal to the fall in the index and this is added to the return on the portfolio. If the option expires out-of-the money then no gain is achieved.

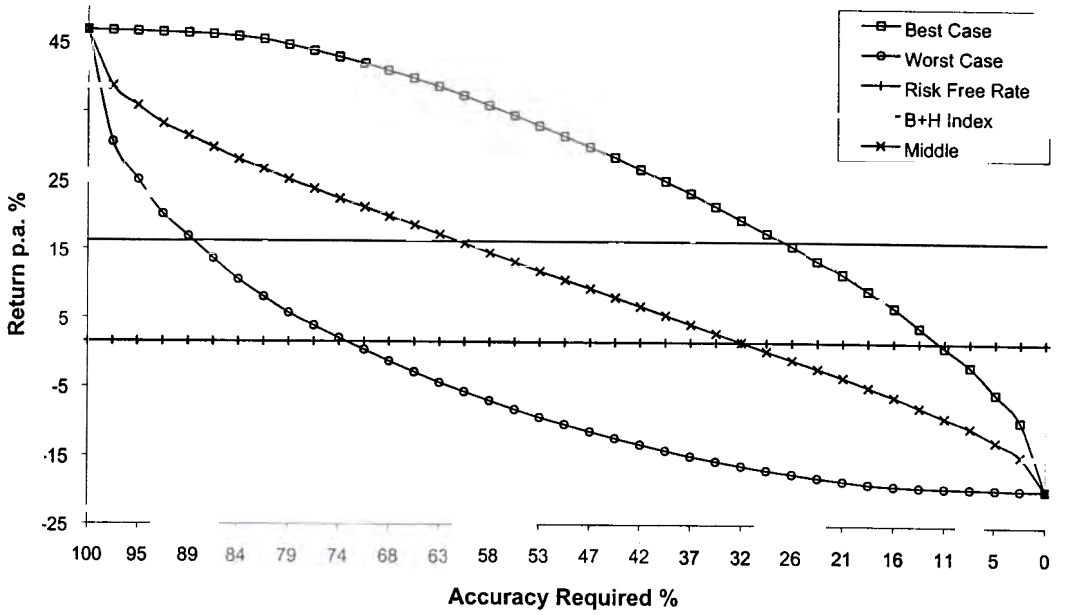
Similarly for bull timing, the return on the money market instruments is achieved in every review period regardless of the market's performance. The return generated by the options, if purchased, is as follows. Firstly the cost of the options is accounted for then, depending on the market's performance, the option will mature in- or out-of-the money. If the market rises then the return gained is equal to that of the index and this is added to the return on the portfolio. If the market falls then the option will mature out-of-the money and no gain will be made.

Perfect timing results in the portfolio achieving the highest possible return and is accomplished by investors making correct predictions as to market movements in each review period. These returns are calculated by selecting the highest return obtainable in each review period depending on the strategy being investigated.

As investors' ability to forecast the market falls, the returns generated will be dependent on which periods are incorrectly forecasted. If the incorrectly forecasted periods have the least effect on the portfolio then the maximum possible return will be generated for that level of predictive accuracy. If however the erroneous forecasts have the greatest effect on the portfolio then the lowest possible gain for that level of predictive accuracy will be achieved. These two outcomes generate boundaries between which the range of possible returns for a given level of predictive accuracy is obtainable. When the returns are graphed against predictive ability a 'football' graph, first identified by Jeffrey (1984), is formed as shown in figure 2.

This analysis is carried out for each strategy on each of the identified bull and bear periods. Five key points are identified as indicated in figure 2. A and E are the maximum and minimum returns from perfect and imperfect timing respectively. Point B represents the predictive accuracy necessary to be guaranteed a return greater than the buy-and-hold and point C is the predictive accuracy required to have

Figure 2 Typical Football Graph



an equal chance at beating the market. Point D represents the predictive accuracy below which it is impossible to beat the market regardless of which periods are incorrectly forecasted.

Results

The analysis described above was run for the three timing strategies across each of the bull and bear market phases as well as on the time series as a whole. The returns achieved are shown in table 2.

Perfect traditional timing over the full sample period (1925-2000) generates a superior return to that of either perfect bull or bear timing. Traditional timing is by far the most effective strategy, although transactions costs were not included. They would have to be about 1,85 percent per switch before perfect traditional timing would yield a similar return to that of perfect bear timing. Bull timing did not fare as well as bear timing due to the many call options that the bull timers had to purchase in order to benefit from the market rises.

A similar pattern of results emerges for perfect timing when the analysis is applied to the bullish phases only, except that the returns generated are notably higher. As with the full sample period, traditional timing performs the best followed by bear timing and lastly bull timing. Comparing the two option strategies, perfect bear timing outperforms perfect bull timing due to the bull timers having to purchase far more options than the bear timers to take advantage of the bullish market. This added cost severely reduces returns, whereas the bear timers generate the bulk of their returns by merely holding the underlying index.

For timers who are 100 percent incorrect, traditional timing performs the worst. This is because when an incorrect decision is made, the loss to the traditional timer is equal to the difference in returns between the two asset classes. This difference is often greater than the cost of the options, which is the loss experienced by the option timers. Imperfect bear timing outperforms imperfect bull timing due to the performance of the underlying assets held. Bear timers will always benefit from the market rises regardless of the timing decision made, yet bull timers only experience the returns gained by the money market instruments which are frequently lower than the index's return during these bullish phases.

The effectiveness of each of the strategies is altered when the market enters a bearish phase. Obviously all the returns are lower due to the poor performance of the market. On the perfect timing front, traditional timing remains superior for the same reasons stated previously. Contrary to Waksman *et al's* (1997) findings, bull timing outperforms its bear timing counterpart in all but the first three bear periods. This occurs because, during a bearish market, perfect bear timers have to

Table 2: Annualised returns (%)

Period	Date	B+H Index	B+H Cash	Bull	Bear	Traditional	Bull	Bear	Traditional	Insurance	
				Maximum Return Point A*			Minimum Return Point E*				
Total	1/25 to 12/00	14.0	6.3	23.1	27.4	36.4	-5.1	-0,7	-11,1	10.9	9.8
Bull	1/33 to 1/37	37,8	0,2	21,4	40,5	42,5	-3,4	14,9	-3,1	17,2	17,0
Bull	2/41 to 1/48	24,0	0,0	16,9	25,9	27,9	-2,6	12,2	-0,5	13,9	13,8
Bull	1/66 to 4/69	39,1	5,5	35,4	45,6	51,2	0,7	23,8	1,2	29,6	29,2
Bull	1/72 to 6/73	56,5	6,6	35,9	56,8	62,0	-2,3	24,8	8,8	25,1	24,5
Bull	6/77 to 9/81	46,2	8,0	46,3	64,8	74,6	-2,8	17,4	-6,0	32,3	31,6
Bull	6/82 to 8/87	45,8	16,7	52,1	62,3	79,0	0,5	19,6	-1,9	33,1	31,0
Bull	1/89 to 1/90	60,9	19,2	59,7	72,3	83,9	9,5	39,8	13,6	49,8	46,7
Bull	2/93 to 12/95	25,8	12,9	28,5	36,2	44,4	0,5	6,6	3,8	15,3	14,4
Bull	1/99 to 8/00	34,1	13,6	36,6	44,6	63,9	-8,6	3,0	-0,4	11,0	9,8
Bear	5/28 to 1/33	0,3	3,2	14,0	14,3	20,9	-4,5	-7,3	-14,4	5,7	5,5
Bear	1/37 to 2/41	-1,6	0,0	4,9	8,4	11,8	-4,3	-8,9	-12,0	0,4	0,3
Bear	1/48 to 1/62	2,5	2,1	9,7	12,6	15,9	-11,0	-10,2	-9,7	-1,3	-4,4
Bear	4/69 to 1/72	-15,5	7,2	22,7	17,9	38,7	-13,5	-28,9	-34,7	-0,9	-0,9
Bear	6/73 to 6/77	-2,0	10,0	34,1	28,3	55,8	-12,9	-18,7	-30,8	6,5	6,2
Bear	9/81 to 6/82	-35,7	17,2	17,5	-2,3	24,8	-13,2	-42,6	-38,8	-12,8	-13,0
Bear	8/87 to 1/89	-8,3	12,6	25,8	21,6	48,4	-11,7	-25,2	-30,2	-0,8	-1,3
Bear	12/95 to 1/99	1,6	16,2	35,5	27,7	46,7	-1,4	-8,6	-19,6	15,0	13,7

* Points A and E refer to points on Figure 2

continuously purchase put options just to maintain their portfolio's value, whereas the bull timers' portfolio actually grows from the return generated from holding the money market instruments.

During the bear market phases, for 100 percent incorrect timers, traditional timing again ranks as the worst strategy for the reasons explained earlier. Bull timing remains superior to bear timing largely due to the performance of the underlying assets. The market performed particularly poorly during these periods and combined with incorrect timing decisions results in the low bear timing returns. The bull timers, however, are supported by the performance of the money market instruments which help off-set the incorrect timing decisions.

The returns generated from portfolio insurance and market speculation were also calculated. Portfolio insurance is the return generated by holding the index and purchasing put options in every review period, whereas speculation involves holding the money market instruments and purchasing call options in every period. The returns generated from these two strategies do not differ substantially and this can be attributed to put-call parity and riskless arbitrage rational (Waksman *et al*, 1997). What is of interest is that during the bull phases these two strategies under-performed the market but under the bearish conditions they outperformed the index in every period but one (1/48 to 1/62).

The bullish and bearish market phases had a substantial effec on the required predictive accuracies needed to beat th market. Table 3 shows the accuracies required for the thre strategies to outperform the market under the different marke conditions.

The results for the total time series are typical of previous studies. In order to be guaranteed a return greater than buying and holding the index (point B) accuracy levels around the high eighties are required. There appears to be little difference between the required accuracies for bear timing and traditional timing. Bull timing, however, required a higher degree of forecasting ability for the three identified levels (points B, C and D).

When the market turns bullish it appears to become extremely difficult to beat the index regardless of which strategy is chosen. In most cases even perfect bull timing is not capable of outperforming the benchmark largely due to the costs of the many call options needed to benefit from the market's good performance. There also appears to be very little difference between bear timing and traditional timing. Both strategies require predictive accuracies in the high eighties to low nineties to be guaranteed a return greater than that of the index and in most cases the accuracy required just to have an

Table 3: Required predictive accuracies (%)

Period	Date	Bull Timing			Bear Timing			Traditional Timing	
		Sure Gain Point B*	Equal Chance Point C*	Sure Loss Point D*	Sure Gain Point B*	Equal Chance Point C*	Sure Loss Point D*		
Total	1/25 to 12/00	91,7	76,1	35,2	86,2	56,6	21,3	86,1	23,7
	1/33 to 1/37	100,0	100,0	100,0	96,1	91,7	73,1		
	2/41 to 1/48	100,0	100,0	100,0	94,1	87,9	70,0		
	1/66 to 4/69	100,0	100,0	100,0	87,1	73,5	53,3		
	1/72 to 6/73	100,0	100,0	100,0	99,5	99,1	94,4		
	6/77 to 9/81	100,0	99,9	96,7	86,0	67,2	43,8		
	6/82 to 8/87	97,0	93,6	70,0	86,5	68,6	36,1		
	1/89 to 1/90	100,0	100,0	100,0	87,3	70,6	51,9		
	2/93 to 12/95	98,7	97,8	64,8	88,7	71,5	50,0		
	1/99 to 8/00	98,3	96,7	86,0	86,7	77,2	54,1		
	5/28 to 1/33	60,6	14,0	2,8	69,5	31,7	13,4		
	1/37 to 2/41	52,5	24,5	11,1	72,2	41,4	18,0		
	1/48 to 1/62	93,9	78,9	24,9	92,4	64,0	16,6		
	4/69 to 1/72	0,0	0,0	0,0	64,1	26,3	12,1		
	6/73 to 6/77	51,1	22,8	10,3	69,5	36,5	14,2		
	9/81 to 6/82	0,0	0,0	0,0	52,6	15,3	7,2		
	8/87 to 1/89	31,4	10,9	5,8	79,8	32,8	8,5		
	12/95 to 1/99	27,1	6,5	3,2	78,0	14,3	2,9		

* Points B, C and D refer to points on Figure 2

equal chance of beating the market is in the low seventies. Clearly from these results market timing during a bullish phase is unlikely to outperform the market and it would be advisable to merely invest in the index and benefit from the strong market returns.

However when the market turns bearish, doors of opportunity open for market timing. For bear timing and traditional timing, the required predictive accuracies for certain gain fall to around the high sixties/low seventies. What is more reassuring is that the required predictive accuracy to have an equal chance of beating the market all fall below that of a random guess except for one period (1/48 to 1/62). This implies that if investors randomly chose which asset class would perform best in the next review period then they would have a better than average chance of beating the index. This is a departure from previous findings that implied that some level of timing ability (i.e. above 50 percent) is required to gain from such an investment strategy.

What is of even more interest is the performance of bull timing during these bear periods. It is by far the best strategy, requiring low predictive accuracies to guarantee a return greater than that of the market. In two cases, 4/69 to 1/72 and 9/81 to 6/82, any level of predictive ability, including 100 percent imperfect timing, would have outperformed the index. This occurs due to the superior returns generated from the underlying money market instruments. This added return provides a buffer in which erroneous forecasts can be absorbed before the return falls below that of the benchmark. In many cases forecasting ability below that of a random guess would guarantee a return greater than the index. This is a departure from previous studies and reinforces what Sy (1990) highlighted, namely that there are pockets of time in which market timing could be a viable and successful investment strategy.

Two other measures used to quantify the risk of a market timing strategy are the loss/gain ratio and the compression ratio. The loss/gain ratio is the absolute ratio of potential loss from 100 percent inaccurate timing to potential gain on perfect timing, relative to the buy-and-hold return. The compression ratio measures what proportion of the most influential periods investors can miss, relative to the total number of periods, before the returns fall below that of the buy-and-hold strategy. If investors miss all of these periods then it would be impossible for them to outperform the index. The loss/gain and compression ratios for the three strategies are shown in Table 4.

The loss/gain ratios for the full sample period, being greater than 1 for each strategy, indicate that investors can lose more than they can gain. For bull timing the ratio is above 2 indicating that range of possible returns from under-performing the index is more than twice that for outperforming it.

Table 4: Loss/gain and compression ratios

Period	Date	Loss/Gain Ratio			Compression Ratio		
		Bull	Bear	Traditional	Bull	Bear	Traditional
Total	1/25 to 12/00	2,1	1,1	1,1	8,3	13,8	13,9
	1/33 to 1/37	*n/a*	8,3	8,7	0,0	3,9	1,3
	2/41 to 1/48	*n/a*	6,3	6,3	0,0	5,9	1,6
	1/66 to 4/69	*n/a*	2,4	3,1	0,0	12,9	6,3
	1/72 to 6/73	*n/a*	105,5	8,7	0,0	0,5	3,5
	6/77 to 9/81	716,5	1,6	1,8	0,0	14,0	11,8
	6/82 to 8/87	7,2	1,6	1,4	3,0	13,5	12,9
	1/89 to 1/90	*n/a*	1,8	2,0	0,0	1,3	12,3
	2/93 to 12/95	9,7	1,9	1,2	1,3	11,3	9,1
	1/99 to 8/00	16,7	3,0	1,2	1,7	13,3	17,0
	5/28 to 1/33	0,4	0,5	0,7	39,4	30,5	20,4
	1/37 to 2/41	0,4	0,7	0,8	47,5	27,8	26,3
	1/48 to 1/62	1,9	1,2	0,9	6,1	7,6	14,1
	4/69 to 1/72	0,0	0,4	0,4	100,0	35,9	36,9
	6/73 to 6/77	0,3	0,6	0,5	48,9	30,5	29,5
	9/81 to 6/82	0,0	0,2	0,05	100,0	47,4	68,5
	8/87 to 1/89	0,1	0,6	0,4	68,6	20,2	33,5
	12/95 to 1/99	0,09	0,4	0,5	72,9	22,0	27,1

n/a implies that perfect timing (inclusive of the costs of the options) fails to outperform the index.

For the bull market phases the loss/gain ratio rises substantially for all three strategies indicating that the range of possible returns available above the buy-and-hold return is significantly less than the obtainable range below the benchmark return. The *n/a* result arises when perfect timing fails to outperform the index after taking the option costs into account.

When the market turns bearish this ratio falls below 1 for each strategy in all time periods except one, 1/48 to 1/62. This implies that the range of possible returns above the buy-and-hold return is greater than the range below, signifying that investors can gain more than they can loose. For bull timing there are two cases where the loss/gain ratio is zero, indicating that investors could not under-perform the index irrespective of their timing ability.

The compression ratios highlight the importance of predicting the most significant of the market rises and indicate how much of an influence only a few exceptional periods have on a market timing strategy. For the whole time series the compression ratio was about 14 percent for traditional and bear timing and even less for bull timing. This implies that if investors incorrectly predicted the top 14 percent of the periods then it would be impossible for them to outperform the market.

When the market turns bullish, compression ratios fall further, indicating that almost any error in forecasting is likely to result in under performance. For bull timing five c the compression ratios are zero indicating that any forecastin error will result in a return less than the benchmark.

For the bearish market phases the compression rations ar considerably higher in all but one period, 1/48 to 1/62. Thi indicates that when the market turns bearish there appears t be far more room for error. In some cases the compressio ratio is greater than 50 percent indicating that even if the bes half of the periods were incorrectly forecasted the strateg would still outperform the index.

The loss/gain and compression ratios reinforce the othe results of the study. Market timing during bullish periods should be avoided but during bearish market phases there appears to be a better than average chance of beating the market.

Conclusions

This study highlights the potential gains and pitfalls of market timing. Yet it also identifies under what market conditions does market timing may become viable. When the market is experiencing a bull run it seems that market timing is not a feasible investment strategy due to the high forecasting ability required to beat the benchmark. It would be better for investors to simply buy-and-hold the index and benefit from the exceptional performance of the market.

However, when the market turns bearish, opportunities appear for market timers. Under these market conditions a relatively low level of forecasting ability is required to out perform the buy-and-hold return. Bull timing performs remarkably well under these conditions such that even a random guess could yield a return above the benchmark.

Though market timing is a controversial investment strategy, and is not without risk in bearish phases of the market cycle, there does appear to be identifiable opportunities to earn high rewards without requiring the investor to have near perfect forecasting ability.

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