



National sporting success and investor optimism

Contrary to findings of overseas studies, the mood of South African investors seems to be influenced less by the outcomes of national sporting events.

_____ by Brendan Smith and Niel Krige

In recent years several international studies have examined the economic impact of sporting events, especially to find possible links between the performance of national sports teams and stock prices. The findings are generally mixed: while some studies indicate quite a strong link, others have found weak or statistically insignificant relationships.

Although the general body of investment theory is largely dominated by rational philosophies – which typically disregard theories about how winning rugby tests influences investment behaviour – the subfield of behavioural finance has lately grown in prominence. Researchers in this field have increasingly come up with findings to show that investors may indeed be influenced by

seemingly non-economic considerations like mood changes and other psychological dispositions. The results of these studies indicate that movements in stock prices can, at least partly, be attributed to such factors.

In line with this thinking, and also because the economic importance of sport has increased worldwide, researchers have started studying the

extent to which the results of popular national sporting events may influence stock prices. Prompted by the growing body of international research, a study along similar lines based on the South African stock market was conducted at the University of Stellenbosch Business School (USB). South Africa is generally known as a sport-loving country – almost fanatically so – with the outcome of vital matches being met with extreme emotion. One therefore sees intense ups and downs in mood when national teams win or lose against archenemies. The important question asked in the study is: To what extent are such victories celebrated, or defeats lamented, in next-day investment decisions?

International evidence of links between match outcomes and stock returns

Examples of international studies that have produced findings about the link between stock price movements and sport results are plentiful. A 2003 study in England found a strong association between the performance of the English soccer team and daily changes in the FTSE 100 index on the London Stock Exchange. Wins by the national team were followed by upward movements of the index, while losses led to downward movements. Also in 2003, a New Zealand study investigated the impact of the All Blacks rugby team on the national stock exchange, but concluded that no relationship existed.

Another study, published in 2007, covered a broader cross-section of sports throughout Europe, including soccer, rugby, basketball and cricket. As with the English study, the researchers found a link between game losses and negative stock returns, but this time not between wins and positive returns. The absence of a win impact was attributed to sport fans having unrealistic expectations of their team's performance; a loss therefore created a much greater negative change in mood than a win would create a positive change.

In the 2007 study, the loss impact after soccer matches was found to be rather substantial and more severe than after other sporting events. In monthly terms, the lower returns associated with a soccer loss exceeded 7%. It was pointed out that international soccer matches are unique in that there are few other regular events that can cause such a substantial change of mood in a large proportion of a country's population. The study also found that the impact was stronger in

smaller stocks. The explanation offered was that small stocks are more likely to be held by private investors than by institutional ones. Mood changes caused by a country's sporting performance could be expected to influence private investors more than they would institutional investors.

Research was also published in 2008 about the impact of India's performance in one-day international cricket matches on the Indian stock exchange. The results suggested that the performance of the national team strongly affected returns on the Indian stock market.

More studies of this nature, especially with regard to soccer, have been conducted in other parts of the world, including Turkey and the United States. And most of them have found a positive link between match outcomes and stock returns.

There are also examples of research that take a deeper interest in the psychology behind this phenomenon. Interestingly, it seems that investment outlook is not to be explained simply by whether a person's mood is up or down. Research has shown that there is a correlation between people's perception of their own abilities and the success of the team they support. When their teams win, supporters experience a lift in self-esteem – as if the victory affirms their personal effectiveness.

To what extent are victories celebrated, or defeats lamented, in next-day investment decisions?

This surge in confidence makes investors feel more optimistic about taking the right investment decisions – while team losses have the opposite effect.

Other research emphasises the growing economic influence of sport. The ushering in of professional sport has certainly enhanced its economic significance, with many teams now even being listed on stock exchanges. Sponsorship, advertising and retail sales of sports clothing and equipment have also become a huge global industry worth billions of dollars. There is not only a feel-good factor that emanates from national sports, but also a greater confidence about future economic prospects. Investors may recognise the growing importance of international tournaments

and the increasing commercialisation of sport and sponsorship. An efficient stock market will revise its expectations of potential economic benefits based on important national match results.

Putting South African data to the test

The USB research aimed to replicate some of the previous studies from a South African perspective. The focus of the study was on South Africa's three dominant sports: soccer, rugby and cricket. South Africa competes regularly in international matches in all three sports, and these sports draw the greatest national interest.

In order to examine the extent to which investors across a stock exchange react to sport outcomes, sporting events where the majority of market participants support the same team should be targeted. The psychological impact of sport results would be cancelled out in the case where one team's victory means another team's defeat for fan bases investing in the same market. For this reason the research focused on international contests involving the national teams and not on domestic matches.

Stock price and match result data

For a study of this nature, daily stock price data are required. The data were obtained from the McGregor BFA database, from where daily data were available from 4 September 1995. In this study daily data on the JSE All Share Index up to 2 February 2009 were used – a total of 13,5 years.

Data on all international cricket, soccer and rugby match results were collected for the same period. Cricket results were obtained from the Cricket Archive website, which contains detailed information regarding every cricket match played by the Proteas. In contrast to the Indian study, which considered only one-day international matches, this study covered all three forms of cricket – five-day, one-day and twenty-twenty matches. Soccer results were obtained from the South African Football Association (SAFA) and rugby results from the Springbok Rugby Hall of Fame. Detailed match results and statistics were available for all matches played by Bafana Bafana and by the Springboks during the period of interest.

Match outcomes for each sport were classified into wins, draws and losses, and these outcomes were also tallied up as a category for all sports combined. In order to measure the impact of a team's performance on stock returns, the daily return of the All Share Index on the first trading

TRADING AND MATCH STATISTICS

	Number of trading days	Mean return (%)	Std Dev of returns
All trading days	3 357	0.0516	1.323
Trading days (no games)	2 653	0.0572	1.293
Trading days (all games)	720	0.073	1.450
All sports			
Trading days after wins	441	0.115	1.598
Trading days after draws	74	0.082	1.365
Trading days after losses	205	0.006	1.074
Cricket (Proteas)			
Trading days after wins	280	0.083	1.772
Trading days after draws	48	-0.174	1.082
Trading days after losses	114	-0.015	1.158
Soccer (Bafana Bafana)			
Trading days after wins	79	0.277	1.200
Trading days after draws	25	0.597	1.719
Trading days after losses	44	0.130	1.004
Rugby (Springboks)			
Trading days after wins	82	0.065	1.277
Trading days after draws	1	-0.459	n/a
Trading days after losses	46	-0.058	0.924

day immediately following a match was identified. Although the outcome of a match may be known during the course of a particular day, the first trading day immediately following the match was used in order to ensure that match results were

known before trading began. This also ensured that returns for a particular day reflected a full day's trading and allowed for easier comparison. It often happens that more than one match is played prior to the next trading day. For example,

over a weekend, there may be matches played by all three national sports teams. This means that the first trading day after each match will be the Monday after the weekend, and therefore the observation is the same for each sport. If the result of each match was different, for instance a win in one sport and a loss in another, the observations were removed from the data. If the result or the outcome was the same for all categories of sport, the observation was retained. This adjustment was quite substantial and accounted for 17% of the population of observations.

A summary of the data collected about trading days, match statistics and daily returns is shown in the table **on the left**.

This analysis shows that there are rather substantial differences between the mean (average) returns of the different event categories. What was important, however, was to do more extensive statistical tests to check whether these differences are statistically significant and not just due to chance.

Four statistical tests

Similar event study techniques as applied by previous research in other countries were employed in this particular study. Since different statistical techniques were used in other studies, it was decided to subject the data to these different techniques and not choose only one. This would increase the robustness of the findings in this case.

The following tests were conducted:

- Z-test for testing the differences in proportions (parametric test)
- T-test for testing the difference in means (parametric test)
- Kruskal-Wallis H-test for testing the difference between means (non-parametric test)
- Dummy-variable regression analysis (see box **on next page** for further explanation)

In statistics, parametric tests are applied under the assumption that the distribution of data (in this case of daily returns) follows a normal curve. It is, however, quite widely accepted that stock return distributions are not necessarily normal. Despite this, most researchers still tend to rely on parametric techniques, assuming that the data distribution approximates normality. In this research, the data distribution was checked and

DUMMY-VARIABLE REGRESSION ANALYSIS

This technique is often used in event studies. Because the key variable in this case – which can only take the discrete positions of win, draw or lose – cannot be accurately represented by a numerical value, it is replaced by separate *dummy* variables in the regression equation. The dummy variables represent the three possible outcomes, win, draw, and lose. Each dummy variable can only take a value of 0 or 1 (which denotes either the presence or absence of that condition in a data point). In this way, the regression equation can treat discrete variables numerically.

found to deviate slightly from normality. Therefore, in addition to the two parametric tests, the non-parametric Kruskal-Wallis test was also performed. A summary of the results from the four statistical tests appears in the table below:

In the table, only results with a significance level of 10% or better are shown. The results of the Z-test for differences in proportions show that the impact of wins in all sports combined is statistically significant at the 1% level; for cricket wins it is significant at the 5% level; and for soccer wins at the 10% level. The results indicate that the impact of rugby wins was not significant. The t-tests show only a few results significant at the 10% level. The dummy-variable regression analyses show only

soccer draws to be significant at the 5% level. The Kruskal-Wallis tests show wins in all sports combined significant at the 5% level, and cricket and soccer wins at the 10% level.

Interestingly enough, losses appear to have no significant impact on stock prices, and neither do rugby wins.

Why South African results differ

These study findings do not fully concur with previous international studies that have found a correlation between sports team performance and stock returns. The results of this research report provide some evidence that wins are followed by greater returns for the all-sports, cricket and soccer

categories. This could be termed a *win effect*. However, the results do not indicate the existence of a *loss effect* for any category of sport. Although the general pattern of returns does indicate that returns are lower after losses for all categories of sport, the observations are not statistically significant. This may simply be due to chance.

The absence of a loss effect and the existence of a moderate win effect for South African sports teams are perhaps as a result of lower, rather than higher expectations by supporters. South African fans may be rather cynical about the prospects of their sports teams. If a team loses, it does not have a significant negative effect on mood. However, if the team wins, the joy factor is more substantial, which is then reflected in stock returns.

A possible reason why the win effect is only moderate and a loss effect is absent could be found in the investment structure of the JSE. Firstly, the JSE has a large proportion of international investors holding South African shares. This would lessen any impact that sporting results of South African teams would have on JSE stock prices as foreign investors would not be influenced by these events.

A further reason is the socioeconomic situation in South Africa. Since most South African citizens cannot afford to invest privately in the stock exchange, one can assume that the majority of investors on the JSE are institutional investors. Institutional investors may be less inclined to be influenced by psychological factors than private investors.

SUMMARY OF TEST RESULTS

Category	Outcome	Z-test	T-test	Dummy-variable regression	Kruskal-Wallis
All sports	Win	$p = 1\%$			$p = 5\%$
	Draw				
	Loss				
Cricket	Win	$p = 5\%$			$p = 10\%$
	Draw		$p = 10\%$		
	Loss				
Soccer	Win	$p = 10\%$	$p = 10\%$		$p = 10\%$
	Draw		$p = 10\%$	$p = 5\%$	
	Loss				
Rugby	Win				
	Draw				
	Loss				



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This study was conducted by Brendan Smith as an MBA research project supervised by Prof Niel Krige. Smith's research report, *Evaluating the economic impact of national sporting performance: evidence from the Johannesburg Stock Exchange*, was presented to the University of Stellenbosch Business School (USB) in December 2009. The research was subsequently published by Brendan Smith and Niel Krige in the *South African Journal of Business Management*, 41(3), September 2010, under the same title.