

## **An assessment of the value of brokerage information for individual investors**

### **1. Introduction**

Many investors who invest on the JSE Securities Exchange (JSE) base their investment decisions on information available in the general and financial press, on discussions in radio and television or on information obtained from a broker or investment consultant. The purpose of this study was to determine whether an individual investor, using information obtained from a stockbroking company, can earn a return in excess of the market return on the JSE.

To test the hypothesis that it is possible for an investor to do so, three portfolios (a buy, a hold and a sell portfolio) were created using the average recommendations received from brokers. For the hypothesis to be accepted, the buy portfolio had to render a return in excess of the market return, the return on the hold portfolio had to be similar to the market return and the sell portfolio had to render a return smaller than the market return.

The research recommendations of three stockbroking companies were obtained and analysed for the period from 1 January 1994 to 31 December 1998. This was done in respect of sixteen companies identified for inclusion in the study. The broker recommendations with regard to these shares were used to construct three investment portfolios that were tracked in time for the whole research period.

The returns of the various portfolios were calculated and evaluated to determine whether an individual investor could earn a return in excess of the market return on the JSE, using research and recommendations obtained from the selected stockbroking companies.

### **2. Literature review**

An overview of global and domestic events that influenced the stock market from 1994 to 1998 is given below. The risk and return measures applied in this study are also discussed. In addition, a brief perspective of past research on the subject is provided.

#### **2.1 Major events affecting share performance on the JSE Securities Exchange during 1994 to 1998**

The South African economy faced an uneasy and disruptive start in 1994, caused mainly by pre-election tension and uncertainty. Fears relating to changes in the new political dispensation and a new administration taking control of the country's affairs slowed economic performance. However, the unexpectedly smooth transition had a positive effect on foreign investors' sentiments and perspectives about South Africa, resulting in large capital inflows into the country. The first half of 1995 saw the economy slow down, with the Gross Domestic Product increasing by only 2,5 per cent, compared to 4,1 per cent during the second half of 1994.

The 1996/97 budget was presented against the background of a sudden collapse of confidence in the rand and capital markets in February

1996. These events revealed South Africa's increased dependence on foreign capital inflows, which are essential to supplement decreasing domestic savings. Financial markets were extremely volatile during the second quarter of 1996, due to a worsening of foreign investor sentiment toward South Africa, triggered by the sharp and continuous depreciation of the rand as well as by increased uncertainty regarding the future direction of economic policy.

The Asian crisis that started in Thailand in July 1997 widened and deepened significantly. Foreign investor confidence in emerging markets was eroded, and consequently there were capital outflows from many of these countries. However, South Africa emerged relatively unscathed.

The 20 per cent devaluation of the rand between May and July 1998 and the sudden six percentage point hike in interest rates were unwelcome shocks to the domestic economy. The financial markets came under pressure in October 1998, as did other international markets, even those in the developed world. Capital from developed countries began to be repatriated and commodity prices came under renewed pressure.

From 1994 to 1998 South Africa implemented a number of economic policies to facilitate the process of globalisation. A major consequence of globalisation for South Africa lay in the opportunities it created for attracting foreign investment funds to the country. South Africa has been relatively successful in this regard, and attracted R200 billion worth of foreign investment funds over the five-year period from 1994

to 1998. Of the foreign funds invested in South Africa, 80 per cent came in the form of portfolio investments. The disadvantage of this type of investment is that it can be very volatile, as was evident in 1998.

It is against the background of these macro economic influences on share prices that the risk and return measures used in this study are examined.

## 2.2 Portfolio returns

The return on a portfolio is calculated as a weighted average of the returns on the individual shares from which it is formed (Gitman, 1994: 225).

Thus:

$$R_p = \sum_i w_i R_i$$

where

$R_p$  = the return of the portfolio;

$w_i$  = the proportion of the portfolio's total capitalization value represented by share  $i$ ; and

$R_i$  = the return of the share in the portfolio.

According to Bodie, Kane and Marcus (1996: 778), the return on a portfolio must be adjusted for risk before the returns can be compared meaningfully. Various methods of risk-adjustment for the performance of a portfolio using mean-variance criteria were developed by Sharpe, Treynor and Jensen.

Jensen's alpha has become one of the standards of measuring performance. The Jensen alpha is defined as follows (Jensen, 1968: 395):

$$\alpha = (R_p - R_f) - \beta_p (R_m - R_f)$$

where

$R_p$  = the return of the portfolio;

$R_f$  = the risk free rate;

$\beta_p$  = the beta of the portfolio; and

$R_m$  = the return of the market portfolio.

A number of other models to determine the performance of a share portfolio have been developed by researchers. Some of these include

Carhart's four-factor model, Daniel, Grinblatt, Titman and Werner's characteristic matching model and the well-known Fama and French three-factor model.

In this study, however, the analyses were done using the Jensen alpha to measure the returns in excess of the market.

### 2.3 Effectiveness of recommendations – previous studies

Prior research on issues relating to recommendations by investment analysts in, for example newsletters, have suggested that such recommendations did not result in exceptional returns for investors.

Research by Womack (1996:165) strongly suggests that the prices of shares are influenced by analysts' recommendations. In a study by Desai and Jain (1995:1257) to analyse the performance of mutual fund managers, share broking houses and pension fund managers, it was observed that, on average, fund managers were not able to outperform passive benchmarks.

Stickel (1995:25) found that brokers' buy and sell recommendations influence the price of the share; and that the strength of the recommendation, the size of the broking house and the simultaneous earnings forecast affect both the short- and long-term price change of the share.

Maug and Naik (1995:1) found that fund managers adjust their portfolio allocation to correlate with other funds. This implies that fund managers may neglect their own superior information about a company when compiling a portfolio.

Studies done on brokers by Arbel, Carvell and Strebel (1983:57) show that shares of companies neglected by institutional investors have been able to outperform the returns of a portfolio consisting of shares more widely held by such institutional investors. McNicols and O'Brien (1997:197) also found that analysts tend to issue recommendations selectively, depending on whether the information available to the analysts is favorable or not.

### 3. Research methodology

Three hypotheses, that the buy portfolio should earn a return in excess of the market return, that the hold portfolio should earn a return similar to the market return and that the sell portfolio should earn a return smaller than the market return, will be tested.

In order to conduct the research, investment recommendations were obtained from Fleming Martin Securities Ltd, Deutsche Morgan Grenfell Ltd and HSBC Simpson McKie (Pty) Ltd. These broking houses were selected on the basis of the results of the *Financial Mail* "Analyst of the year" awards. For the purposes of the awards, brokers were evaluated in terms of the quality of their fundamental research, effectiveness of dealing, administration and the accuracy of their forecasts.

The *Financial Mail* Top 100 Companies survey was used to identify the sixteen companies used in this study. The companies chosen represent seven sectors on the JSE and were chosen on a matrix basis, taking into consideration (inter alia) turnover and assets.

The companies are the following:

- Anglo American Industrial Corporation Ltd
- Barlows Ltd
- C G Smith Ltd
- Engen Ltd
- Imperial Holdings Ltd
- Liblife Strategic Investments Ltd
- Nampak Ltd
- Pepkor Ltd
- The Premier Group Ltd
- Rembrandt Group Ltd
- The South African Breweries Ltd
- Safmarine and Rennies Holdings Ltd
- Sasol
- Sappi Ltd
- Tiger Oats Ltd
- Wooltru Ltd

The investment recommendations of the three broking houses for each of the sixteen companies were obtained for the period from 1 January 1994 to 31 December 1998. An average recommendation was calculated and, based on this recommendation, three portfolios were compiled on a daily basis. Three portfolios (buy, hold and sell) were used to calculate the performance of the recommendations received from the brokers.

Daily share prices were collected for the period from 1 January 1994 to 31 December 1998. These prices were obtained from the database of McGregor-BFA. As the number of shares issued was not available on the McGregor-BFA database, they were obtained from the Johannesburg Securities Exchange Bulletin. It was assumed that the number of shares of a company remained constant during the month.

All changes during the month are reflected for a company in the number of shares at the beginning of the following month.

The return on each portfolio was calculated on a daily basis. Using the geometric average method, a return can be calculated for each portfolio on a monthly basis. The profits and losses of the transactions on the portfolios were accounted for by using the geometric average method to calculate the return of the portfolio.

Using the monthly returns of each portfolio, an average annual return for each portfolio was calculated. The portfolios were recompiled on a daily basis to enable new recommendations to be incorporated into the portfolio selections the following day. The monthly return of each portfolio was compared to the monthly movement of the JSE All Share Index and the Industrial Index. In addition, the risk-adjusted performance of the portfolio was also evaluated using Jensen's alpha measure.

Both the raw and risk-adjusted returns were gross of any costs such as trading costs or brokerage commissions. Dividend payouts were not taken into account in calculating the daily returns on a share.

#### 4. Empirical results

During the period under review, the three broking houses made a total of 1 573 recommendations concerning the sixteen companies selected. Thus an average of 6,6 recommendations per company per year were issued by each broker.

It should be noted that where a recommendation is made by a broker in respect of a share it is often identical to a recommendation issued previously. If these duplicate recommendations were omitted from the study, a total of 547 recommendations remain. They constitute an average of 2,3 recommendations per company per year.

Of the 1 573 recommendations issued by the three brokers in respect of the sixteen selected companies during the period from 1 January 1994 to 31 December 1998, 678 (43,1 per cent) were recommendations to buy, 653 (41,5 per cent) were recommendations to hold and 242 (15,4 per cent) were recommendations to sell. The majority of the recommendations issued by the brokers were thus recommendations to buy or hold. Of the total of 547 recommendations, 36,6 per cent were recommendations to buy, 46,6 per cent were to hold and 16,8 per cent were to sell.

The study by McNicols and O'Brien (1997:170) noted that analysts seldom issue recommendations to sell. In their sample, recommendations to sell made up only 9,5 per cent of the analysts' rating. In the study by Stickel (1995:26), 55 per cent of the recommendations examined were recommendations to buy, 33 per cent were to hold and 12 per cent were to sell. The correlation coefficient between the percentages documented in the Stickel study and those noted in this study is 0,88.

The annual return for each portfolio is detailed in Table 1, which also shows the returns on the JSE All Share Index and the Industrial Index for each year. The buy portfolio rendered a 12,6 per cent cumulative return over the five-year period, a larger return than the movement in either the All Share Index (2,7 per cent) or the Industrial Index (2,3 per cent). The return of the hold portfolio for the five-year period was 1,5 per cent, which was below the movement of the All Share Index's cumulative return (2,7 per cent). It was also less than the cumulative return of the Industrial Index (2,3 per cent). The cumulative return of the sell portfolio was negative 6,5 per cent, which was below both the All Share Index return and the Industrial Index return.

**Table 1: Risk-unadjusted returns**

	Buy	Hold	Sell	All Share Index	Indus-trial Index
1994	55,8	6,6	- 12,5	23,4	24,8
1995	0,8	25,1	- 6,3	6,2	14,4
1996	18,0	2,7	- 2,5	6,4	- 1,3
1997	12,8	- 8,7	- 3,2	- 6,4	- 5,8
1998	- 13,3	- 13,6	- 7,8	- 12,4	- 15,6
1994 to 1998	12,6	1,5	- 6,5	2,7	2,3

The geometric average monthly raw return (natural logarithms) of the buy portfolio was 1,00 per cent, compared to the All Share Index's monthly average of 0,22 per cent and the Industrial Index's movement of 0,19 per cent. The average monthly return (natural logarithms) of the hold portfolio was 0,13 per cent, compared to the average monthly movement of the All Share Index (0,22 per cent) and the Industrial Index movement (0,19 per cent). The monthly average return (natural logarithms) of the sell portfolio was negative 0,56 per cent, compared to the All Share Index movement (0,22 per cent) and the Industrial Index movement (0,19 per cent).

The returns of the different recommendations were evaluated based on the natural logarithm of the growth index. A t-test approach was followed, based on the fact that the natural logarithm of the geometric mean is equal to the arithmetic mean of the natural logarithms of the growth indices. A statistical significance level of 5 per cent was used throughout the analysis.

Table 2 contains the results of the t-test done on the monthly returns of the buy, hold and sell portfolios during the period from 1 January 1994 to 31 December 1998.

From Table 2 one can conclude that, at a significance level of 9,6 per cent, the return of the buy portfolio was greater than the movement in the All Share Index and it was also greater than the movement in the Industrial Index, at a significance level of 8,1 per cent. The hypothesis that the raw return earned on the buy portfolio was greater than the movement in the All Share Index or the Industrial Index could therefore not be rejected.

**Table 2: t-Test results of the risk-unadjusted returns of the three portfolios, compared to the movement in the All Share and Industrial Indices (natural logarithm values)**

<b>Paired Two-Sample test for means: All Share Index versus Buy, Hold and Sell Portfolios</b>				
	<b>All Share Index</b>	<b>Buy</b>	<b>Hold</b>	<b>Sell</b>
Geometric mean	0,222%	0,996%	0,128%	-0,560%
N	60	60	60	60
P value		0,096	0,843	0,193
<b>Paired Two-Sample test for means: Industrial Index versus Buy, Hold and Sell Portfolios</b>				
	<b>Industrial Index</b>	<b>Buy</b>	<b>Hold</b>	<b>Sell</b>
Geometric mean	0,189%	0,996%	0,128%	-0,560%
N	60	60	60	60
P value		0,081	0,878	0,205

Table 2 also indicates that the p-value of the hold portfolio was 0,84 when related to the movement in the All Share Index, and 0,88 when related to the movement in the Industrial Index. It is an indication that the return of the hold portfolio was marginally lower than the return on the All Share or Industrial Index movement, but not significantly so. The hypothesis that the raw return earned on the hold portfolio was equal to the movement in the All Share Index or the movement in the Industrial Index could therefore not be rejected.

From Table 2, one could also conclude that at 19,3 per cent and 20,5 per cent levels of significance, the return of the sell portfolio was not significantly lower than the return of the market. The hypothesis that the market renders a higher return than the sell index could therefore not be accepted.

The performance of the three portfolios is now evaluated on a risk-adjusted basis using the Jensen alpha excess return measure.

The results are shown in Table 3. The buy portfolio showed a 8,5 per cent average excess return over the five-year period compared to the All Share Index and 25,7 per cent compared to the Industrial Index. The average excess return of the hold portfolio for the five-year period was 41,7 per cent compared to the All Share Index and 13,1 per cent compared to the Industrial Index. The average excess return for the sell portfolio was negative 8,9 per cent (compared to the All Share Index) and negative 13,0 per cent (compared to the Industrial Index).

**Table 3: Jensen's alpha – excess returns (per cent)**

	<b>All Share Index</b>			<b>Industrial Index</b>		
	<b>Buy</b>	<b>Hold</b>	<b>Sell</b>	<b>Buy</b>	<b>Hold</b>	<b>Sell</b>
1994	35,3	49,5	-16,9	70,8	19,1	-19,7
1995	-5,6	72,9	-2,9	14,4	38,8	-10,1
1996	8,9	42,2	-4,2	30,5	14,0	-8,9
1997	18,6	27,2	-0,6	26,7	1,5	-7,5
1998	-9,0	22,3	-18,2	-2,8	-3,2	-18,2
1994 to 1998	8,5	41,7	-8,9	25,7	13,1	-13,0

Based on these results it can be deduced that the buy portfolios were able to beat the market. This finding was even more evident in the case of the hold portfolio which produced a return far greater than the market return. The sell portfolios showed a return lower than the market, which is an indication that the brokers' sell recommendations were able to limit investors' losses.

The results of the t-test done on the risk-adjusted returns of the portfolios using the Jensen measure of excess returns are set out in Table 4.

**Table 4: t-Test results of the risk-adjusted returns of the three portfolios, compared to the movement in the All Share and Industrial Indices (natural logarithm values)**

Test for means: All Share Index versus Buy, Hold and Sell Portfolios – Excess Returns			
	All Share Index		
	Buy	Hold	Sell
Geometric mean	0,680%	2,949%	-0,772%
N	60	60	60
P value	0,0000	0,0000	0,0000
Test for means: Industrial Index versus Buy, Hold and Sell Portfolios – Excess Returns			
	Industrial Index		
	Buy	Hold	Sell
Geometric mean	1,924%	1,032 %	-1,158%
N	60	60	60
p value	0,0000	0,0000	0,0000

At a significance level of less than 5 per cent, the risk-adjusted excess returns of the buy portfolio were significantly greater than 0, for both the All Share and the Industrial Indices of the JSE. The hypothesis that the risk-adjusted return of the buy portfolio can render a higher return than the movement in the market was therefore accepted.

The p-values of the excess returns of the hold portfolio were less than 5 per cent for the movement in both the All Share and the Industrial Indices. The values indicated that the hold portfolio risk-adjusted returns were significantly higher than the movement in the All Share Index and the movement in the Industrial Index.

The p-values of the excess returns of the sell portfolio were less than 5 per cent for both the movement in the All Share and Industrial Indices. This indicates that the hypothesis that the risk-adjusted return of the sell portfolio was significantly less than the movement on the All Share and Industrial Indices could be accepted.

## 5. Conclusions

Investors on the JSE base their investment decisions upon information obtained from the general or financial press, radio and television or brokers and investment consultants. The purpose of the study was to determine whether an individual can earn a return in excess of the market return on the JSE using information obtained from stockbroking companies. Three portfolios (buy, hold and sell) were created using the average recommendations received from three brokers.

Based on the risk-unadjusted returns, the buy portfolio showed a cumulative return of 12,6 per cent over the five-year period, a larger return than the movement in both the All Share Index and the Industrial Index. The return of the hold portfolio was 1,5 per cent, slightly below the movement in the All Share Index and the Industrial Index. The cumulative return on the sell portfolio was negative 6,5 per cent, below the movement in the All Share and Industrial Index.

Based on the results obtained from the risk-unadjusted returns, it can therefore be concluded that over the period from 1994 to 1998,

- the buy recommendations received from the brokers gave a return in excess of the market movement;
- the return on the hold recommendations was equal to the movement of the market; and
- the return of the sell recommendations was smaller than the return of the market.

Based on the risk-adjusted returns, the buy portfolio rendered an excess return of 8,5 per cent and 25,7 per cent over the five-year period, relative to the All Share and Industrial Indices respectively. The excess returns of the hold portfolio was 41,7 per cent and 13,1 per cent, also larger than the movement in the All Share and the Industrial Indices. The excess cumulative return on the sell portfolio was negative 8,9 per cent and negative 13 per cent, below the movement in the All Share and Industrial Indices. Based on the results obtained from the risk-adjusted returns, it can therefore be concluded that over the period from 1994 to 1998,

- the buy recommendations received from the brokers were able to render a return in excess of the market movement;
- the return on the hold recommendations was also larger than the movement of the market; and
- the return of the sell recommendations was smaller than the return of the market.

The results of this study indicate that investors can earn a return greater than that of the market return based on brokers'

recommendations to buy and to hold, if no risk-adjustments are made to the returns. If the returns are adjusted for risk, the brokers' recommendations are able to render a return superior or equal to the market and they are able to limit investors' losses in relation to the movement in the market.

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