

Stock Market Predictability

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Today more investment professionals and academics believe that stock markets are at least partially predictable, in other words the past has some bearing on future price movements. But a decade or more ago it was believed that markets were extremely efficient in absorbing new information, and that the efficient market hypothesis (EMH) was associated with the “random walk” theory of price movements. If new information was immediately reflected in stock prices, tomorrow’s price change will only reflect tomorrow’s news and will be independent of price changes today, thus it has no “memory”.

The advent of the internet bubble and the subsequent sell-off convinced many academics and professionals that it must be possible to outperform the market if one can avoid the common psychological pitfalls that investors are prone to. With better understanding and knowledge of the behavioural finance discipline (investment psychology), one should be able to make better investment decisions and at least partially predict market movements by applying certain models.

Benjamin Graham, the “father” of fundamental value investing, is quoted by Malkiel (2003) as saying: “The stock market in the short run is a voting mechanism, but in the long run it is a weighing mechanism”, meaning that the market typically overreacts (too optimistic or too pessimistic) to news in the short run, but over time displays more rationality and that true value will win in the end. Following this argument it can be concluded that market prices and returns typically exhibit two distinct patterns on the arrival of new information, initially a momentum effect (positive serial correlation) and thereafter a reversal pattern (negative serial correlation).

Therefore, stock prices do not exhibit true random walks, some momentum is evident in short-term prices and it is very much consistent with behavioural finance theory (psychological feedback mechanisms). For example, a company makes a surprise positive announcement about its expected earnings. Initially analysts and professional investors will re-rate this company and buy more stock which will push up the stock price. As a result thereof more investors are drawn into the market to buy this share on expectation of further price appreciation. Obviously, the opposite can happen with negative announcements. Thus, stock prices are bound to waves of optimism and pessimism and may deviate far from the fundamental value over the short term.

But why would some reality set in over time? More often than not prices and returns will revert back after a period of a strong surge or slump. First of all, it is not always possible at first to grasp the full impact of news on a company's future performance, but with more additional information coming to the fore it would probably be easier to make a fair assessment what real effect the initial news will have on a company's performance. Secondly, once emotions subside it stands to reason that more rational decision-making will take place. Another explanation rests on the volatility of interest rates and the tendency of interest rates to be mean reverting. Stock and bond market returns compete with each other, when rates go up the prices of bonds and stocks go down and vice versa. Over time this pattern will generate return reversals. Thus, a variety of reasons can contribute to reversal patterns.

How real are these momentum and reversal patterns? A simple answer to this question is that it depends on the time frame being used. For example, if you analyse daily and even weekly prices, price movements will appear pretty random and from a statistical viewpoint it probably is, but once you start to look at monthly, quarterly and yearly data some identifiable patterns and non-randomness will emerge.

Figure 1 displays the autocorrelation (serial correlation) of the rolling annual returns of the JSE All Share Index from 1960 until June 2005. Note the strong positive correlation (momentum) that exists within the first 10 months, but thereafter strong reversal patterns (12-30 months) are visible.

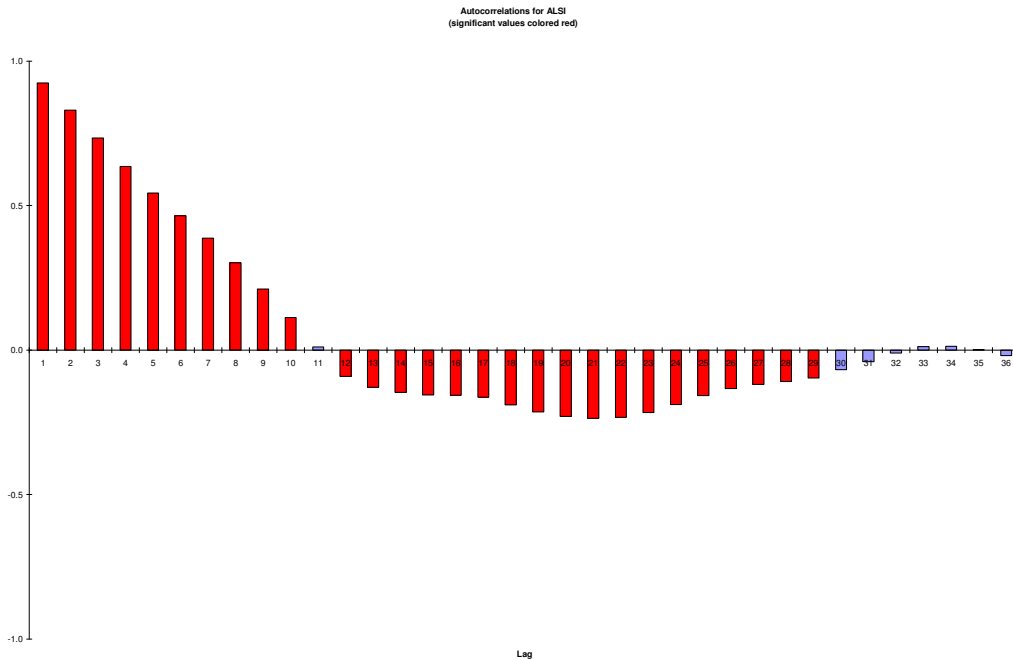


Figure 1: Autocorrelation for the rolling annual JSE All Share Index (ALSI) returns from 1960-2005

What does all the above actually mean? Say for example the ALSI is experiencing a strong bull run; first of all, that is not going to last forever, and secondly, based on historical evidence expect this trend to last a year before some reversal (lower returns) will materialise. Note that reversal does not necessarily imply negative returns, but rather significant lower returns than the previous period.

However, do not expect momentum trends and reversals to exactly coincide with the expected patterns, thus as a timing tool it has perhaps limited use. Notwithstanding that it is useful and reassuring to know that if for example you invest during a bear market phase that reversal will happen some time in the future, but obviously you do not know exactly when.

International studies in general confirm reversal trends on stock markets. Lewellen (2001) evaluated US markets from 1926 to 1998 and found that 1-, 3-, and 5-year returns are negatively correlated to future returns over the subsequent 12 to 18 months. Reversals in one-year returns are the most reliable. Further, this research

confirmed earlier research by Fama and French (1988) which suggested that between 25% and 45% of annual returns are temporary, meaning that it will reverse over the short to medium term.

Research on variations of the “reversal theme” includes a study by De Bondt and Thaler (1987), which evaluated portfolios of stocks that have fared poorly (“losers” with stocks that have done very well (“winners”) prior to the evaluation period. When measured over subsequent five-year holding periods, the portfolio of “losers” outperformed the portfolio of “winners” on average by a staggering 30%! This out-performance could not be attributed to “size effects” (small companies outperforming large companies) or changes in risk profiles, but rather that those reversal patterns were consistent with the overreaction phenomenon by investors on the aggregate, which corrected itself over time.

Another study by Lakonishok, Shleifer and Vishny (1994) compared “value” stocks with “glamour” stocks. Stocks were categorised on the basis of financial ratios such as book-to-market, cash flow-to-price, earnings-to-price (earnings yield) and sales growth. “Value” stocks outperformed the “glamour” stocks over five-year periods and again it could not be attributed to “size effects” or changes in risk profiles, but rather that the market was far too pessimistic about the future performance of “value” stocks and far too optimistic about “glamour” stocks. In a further analysis they found that the “sales growth” and “cash flow-to-price” factors were the most significant drivers in the out-performance of the “value” stocks versus its “glamour” counterparts.

The question arises why investors on the aggregate tend to overestimate (underestimate) the future performance of companies. The well-known behavioural finance gurus, Kahneman (Nobel price winner in 2003) and Tversky, developed the theory that investors forecast without a full appreciation of reversion, in other words they assume that the current situation is permanent in character. For example, if a company is currently doing well, then this performance will be projected into the future, well beyond what is reasonable on the basis of what we know about: the ability of other companies to compete away the profits, the tendency of good managers to find more lucrative opportunities elsewhere, or the loyalty of customers (Skerrat, 2000).

Given the above knowledge about market trending and reversals, how can one apply this in real-life investment situations?

Market traders and speculators are making use of technical analysis tools and charts to predict future price movements and trends, in other words to “time” the market. To some degree one can be successful in doing this - yes, as was shown above, there are identifiable patterns around. However these trends are not necessarily consistent, thus it is not easy to make money just by following technical indicators. Furthermore, transaction costs are a significant factor to consider. But you either believe in these tools or not, mostly, serious investors are not too concerned about short-term price movements or trading activities. However, they should be concerned when they invest in the market, preferably nearer to the bottom than the top.

What measures can be used to judge whether stock markets are “expensive” or “cheap”? The most common valuation ratios in use are the price-earnings (P/E) and dividend-to-price (dividend yield) ratios.

The conventional efficient market theory states that the stock market is not predictable. Therefore no valuation ratio will be able to predict movement in prices, but if the required rate of return (equity premium) is more or less constant over time, then valuation ratios should be more or less stable, fluctuating within their historical ranges (Campbell and Shiller, 1998). For example, if dividend yields are currently at extreme levels, then either the numerator (dividends) or the denominator (price) must move in a direction to restore the historical ratios.

Following the efficient market argument of no price predictability it follows that dividend yields and P/E ratios should be able to predict future growth in dividends and earnings. For example, it is expected that a company with a high P/E will deliver strong earnings growth in the future.

But research by Campbell and Shiller (1998) found that dividend yields and P/E ratios are poor predictors of future dividend and earnings growth (also refer to my July 2005 article). It rather shows a good correlation with the growth in stock prices – in the case of dividend yields a positive correlation and with P/E ratios a negative correlation. Thus, low dividend yields and high P/E ratios predict nothing else than subsequent low returns.

Figures 2 and 3 depict these relationships based on the performance of the JSE ALSI from 1995 until 2005. Note the relative strong inverse relationship between the P/E ratio at the time of the investment and the subsequent five-year period return. Alternatively, the dividend yield and subsequent five-year returns exhibits a positive relationship.

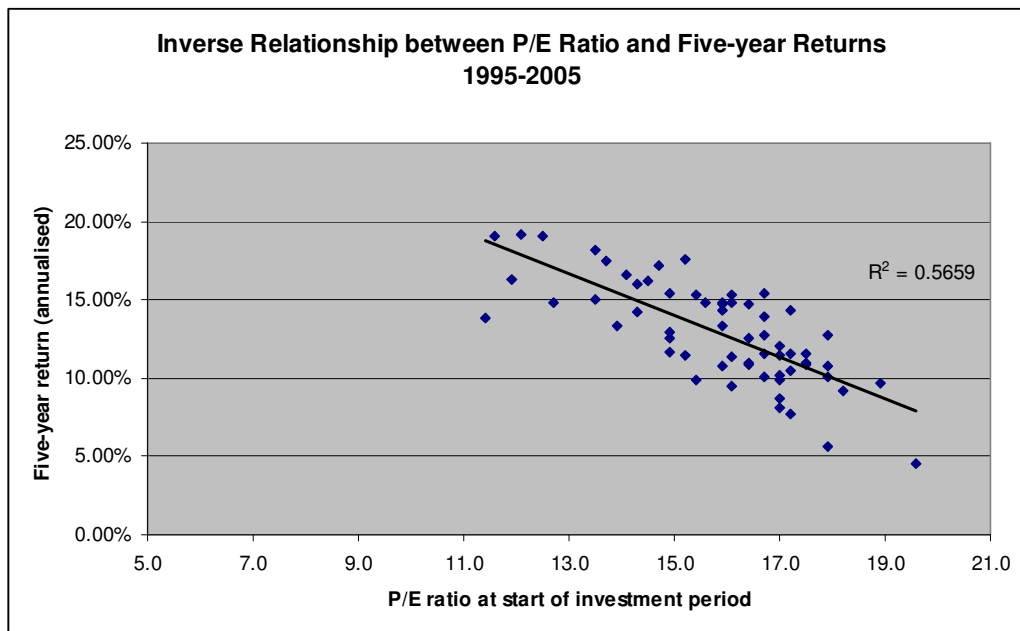


Figure 2: The relationship between P/E ratio and subsequent returns

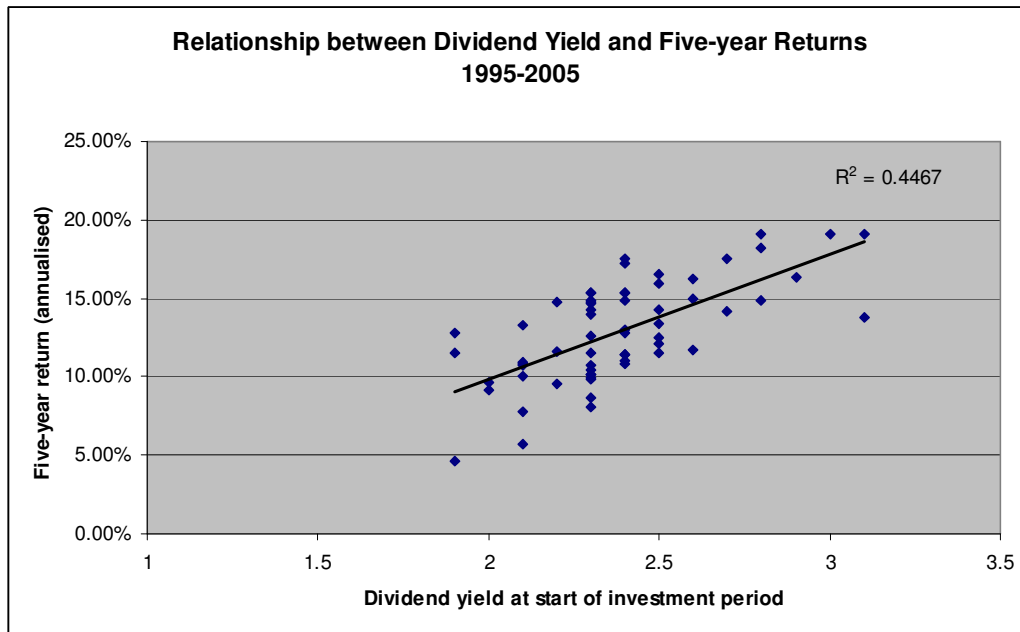


Figure 3: The relationship between dividend yield and subsequent returns

Campbell and Shiller (1998) found in their research that P/E ratios have a strong tendency to mean revert. The changes in valuations are caused by changing market sentiments (“feel good” factors) or alternatively, the changes in yields which reflect the changes in interest rates, which themselves are mean reverting. For example, the so-called “Federal Reserve Model” explains about two-thirds of the variation in P/E ratios over time (Malkiel, 2004).

[The “Federal Reserve Model” compares the earnings yield of the stock market with the yield of long-term bonds, since these two asset classes effectively have to compete with each other to attract investors’ monies].

The question arises how stable are these ratios? Will valuation ratios revert back to the historical means? In other words, how relevant is the historical mean of the dividend yield and P/E ratio in today’s environment? If for example the historical average dividend yield is 4% and today it is 2%, does that mean the market is now expensive and one should rather avoid the stock market?

One must take great care in understanding that these “historical averages and norms” can change over time, because some structural changes can occur which shape our views and future expectations. For example, the advent of the “New Economy” with its technological advances in communication and operational efficiencies lead to higher productivity and profit margins. Secondly, inflation which plagued all major economies in the 80’s and 90’s has been effectively curbed by much better monetary policies. Thirdly, the end of the “cold war” has brought about a feeling of world peace and calmness, at least until the “war on terrorism” erupted in 2001. All these factors can contribute to a “feel good” sentiment, more optimism about the future, which require a lesser equity premium than before, hence higher P/E ratios.

Carlson, Pelz and Wohar (2002) investigated the stability of valuation ratios and whether these ratios will revert back to its historical means. Dividend yields change with changes in corporate finance policies, such as the dividend-payout policy. For example, stock repurchase programmes will substitute dividend payouts; hence fewer dividends will be paid to shareholders. Such a program increases the future earnings per share and this boost to earnings is called the repurchase yield. It has no implication for the P/E ratio if the total payout ratio (dividends and stock repurchases) remains unchanged, thus lower dividend yields are matched by higher repurchase yields.

P/E ratios on the other hand will change with changes in the equity premium required. When a lower premium is required, a higher P/E ratio can be justified. Carlson, *et al.* (2002) states that some compelling arguments can be put forward why the historical equity premium of say 7% can be lowered:

- the changes in costs of holding a diversified investment portfolio (the advent of low-cost investment funds);
- the reduction in transactional costs through technological advances;
- demographic changes, the emergence of a strong middle class buying more stocks;
- accounting standards, where investments in intangible assets are considered as a current expense which understates the real earnings of a firm;

- The structural decline in inflation rates, there is a statistically significant inverse relationship between inflation and the P/E ratio. High inflation forecasts lower earnings growth and higher required returns.

Therefore, Carlson, *et al.* (2002) predicts that the equity premium over long holding periods can be reduced to 4-6%, and not the standard expectation of 7%. If this is true, then the “mean” P/E ratio for example in the US can be shifted to a level of say 18-20 instead of the historical 14-15.

Synopsis:

In South Africa the historical P/E ratio is sitting at around 12-13, but most investors will agree we are now living in a totally different economical and political environment than a decade or more ago. Hence, if the P/E ratio of the market is currently at 15, it is not necessarily an expensive market; our long-term “average” might have shifted to this level and we could still see some upward movement from here.

But it is important to realise reversion will continue as always, albeit at different levels. Stock markets are less than perfectly efficient, some excessive optimism and pessimism will always occur, but then mean reversion is alive and well. Whenever valuation ratios are getting unsustainable, do expect reversion!

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