A Decomposition of Equity Returns in South Africa: 1960-2005

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1. Introduction

Equity investments are perplexing and unpredictable. When you least expect equities to do well – when everyone is bearish – you are most likely to be surprised by the outcome a few years later. Alternatively, when everyone seems to be piling into this asset class, especially on the back of strong past performances, returns in the short to medium term are most likely to be disappointing.

This article attempts to demystify equity returns; showing that it is not only the luck of the draw that will determine whether you will have some success with your investment efforts. After all, it will be shown there is method in the "madness" – there is some logic behind the numbers – and equity returns do not just happen randomly. Basically, there are three primary drivers of equity returns and I will investigate each of them on a historical basis. Finally, I will give some clues what range of equity returns is realistic in the future, especially given where we are today with stock market valuations.

2. The Components of Equity Return: A Theoretical Basis

The return from equity holdings over any period is equal to the sum of dividends received and capital gains. The latter originates from two sources: internally from the earnings growth of the equity holding, and externally from the change in the market rating (price earning multiple) of that equity holding during the investment period.

Equity return = Dividends + capital gains
= Dividend yield + earnings growth + change in PE rating (Equation 1)

The following example is used to illustrate the above concept:

Data	Year = 0	Year = 1
Earnings	R10	R12
Price	R150	R170
Dividend Cover	2.5	2.5
P/E	15.00	14.17
Dividends		R4.80

An investor would have received a dividend of R4.80 plus a capital gain of R20 (R170 - R150); thus a total profit of R24.80, which equates to a return of 16.53% (R24.80/R150) over the holding period.

Alternatively, if the total return is analysed in terms of the three components (equation 1) the following percentage contributions for each are calculated:

Dividend yield	3.20%
Earnings growth	20.00%
P/E Rating Change	-6.67%
Total Return	16.53%

The dividend yield is calculated by the dividends received (R4.80) divided by the share price (R150) from the previous period. The earnings growth is simply the growth in earnings from the previous period (20%), while the rating change contribution is determined by the loss (profit) in value due to market re-rating as a percentage of the share price from the previous period. For example, if the PE rating stayed the same, the share price should have been R180 instead of R170; thus a rating loss of R10 materialised, which is equal to a negative contribution of 6.67% on total return.

3. A Decomposition of Equity Returns: 1960-2005

Following the above methodology the relative contributions of dividend yield, earnings growth and PE rating change to the JSE equity return from 1960 to the end of 2005 were analysed.

Figure 1 illustrates the relative contribution of each component over different periods. For example, from 1976 until 2005, dividends added on average 4.4%, earnings growth 12.8% and the PE rating change 2.9% of the total equity return of 20% per annum. Equity returns have been adversely affected by a negative P/E rating change over the past decade. Note that in all instances, earnings growth is by far the dominant contributory factor towards equity return in the long run, but as we will see later, not necessarily the most influential factor that will determine the absolute return level.

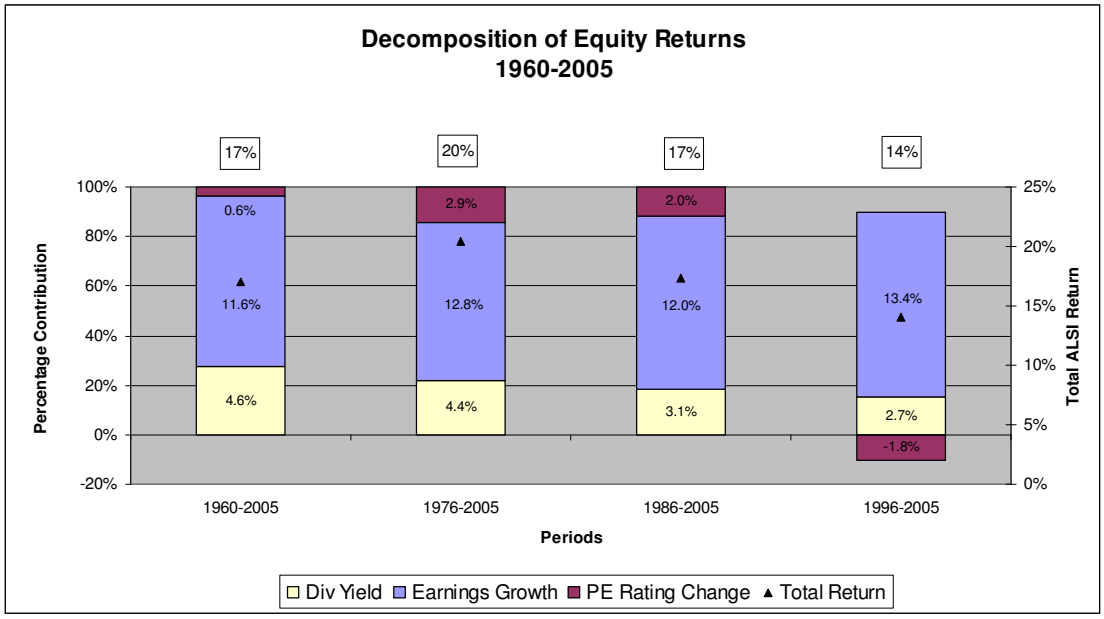

Figure 1: An illustration of the relative contribution of the three components of equity return

Figure 2 depicts a rolling 10-year return over the same period. The dividend yield is more or less consistent, while both earnings growth and rating changes are quite volatile over time. Note that equity return is closely related to the PE rating change trend. The latter is the most influential factor determining the absolute return level. Both the dividend yield and earnings growth act as some sort of buffer for equity returns during periods when the PE rating is trending downwards.

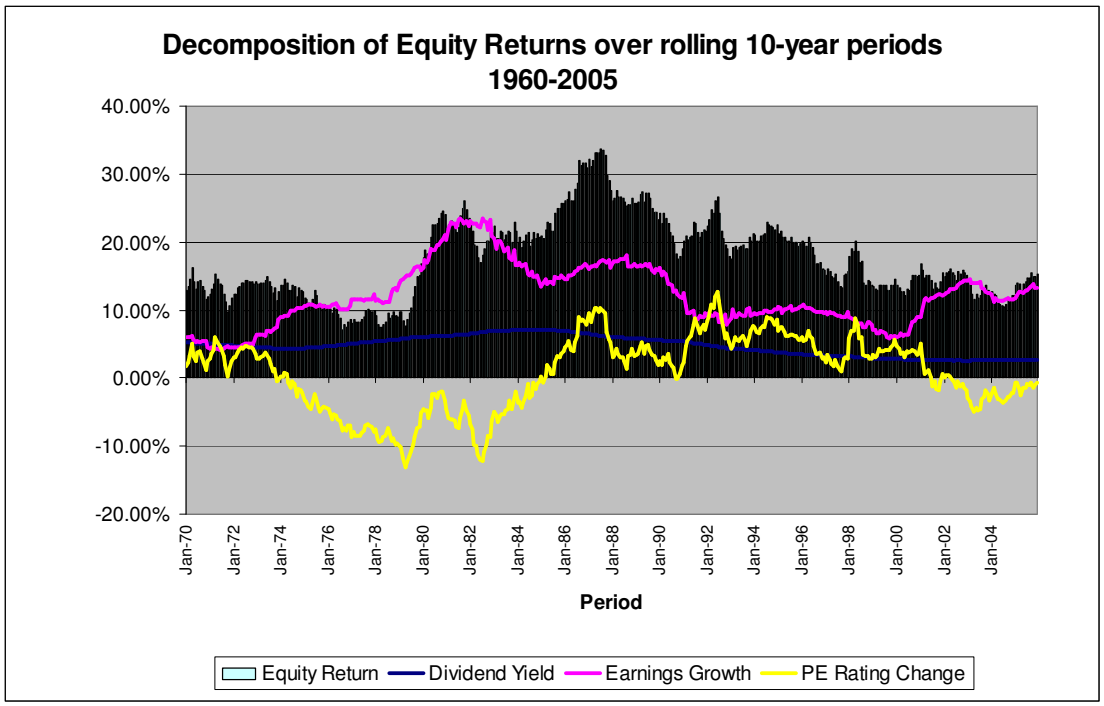

Figure 2: The relative contribution of the three components of equity returns over ten-year rolling periods.

3.1. Dividend Yields

Dividends have been responsible for about 30% of the total return investors received from equity investments. The dividend yield (dividend as a percentage of the share price) is an important yardstick to judge whether equities as an asset class is expensive or not. Typically, whenever the dividend yield is low, shares are considered as expensive, although the dividend yield (tax-free return) must be compared with the relative attractiveness of alternative asset classes (bonds, properties or cash) on an after-tax basis before some verdict can be reached.

Figure 3 illustrates the dividend yield. Historically, the average dividend yield is 4.7% (depicted by the straight line), while it can be seen that the current yield is about 2.5% and nearing previous lows (one standard deviation below the average yield). Furthermore, it is evident whenever extreme levels (lows or highs) were reached, some sharp corrections followed.

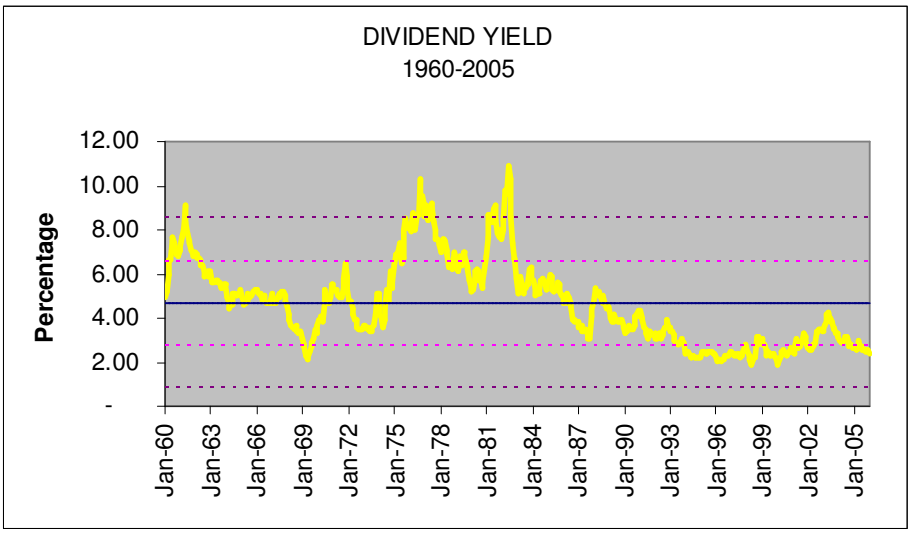

Figure 3: The dividend yield

Note that over the past decade and a half the dividend yield has been constantly below the average dividend yield; indicating a structural lowering of dividend yields. Figure 4 displays the trend in dividend cover (how many times the total earnings of a company covers the dividends paid out) from 1960 until today. It can be seen that the dividend cover increased considerably since the late seventies as inflation has forced companies to lower their payout ratios (figure 5) and to retain more earnings to finance future growth (the payout ratio dropped from 60% to about 30%). Dividend cover reached a peak of about 3 times in 2000. Since then with the advent of a structural lower inflation environment and greater shareholder demand for better dividend payouts, the dividend cover has dropped considerably (currently at 2.6).

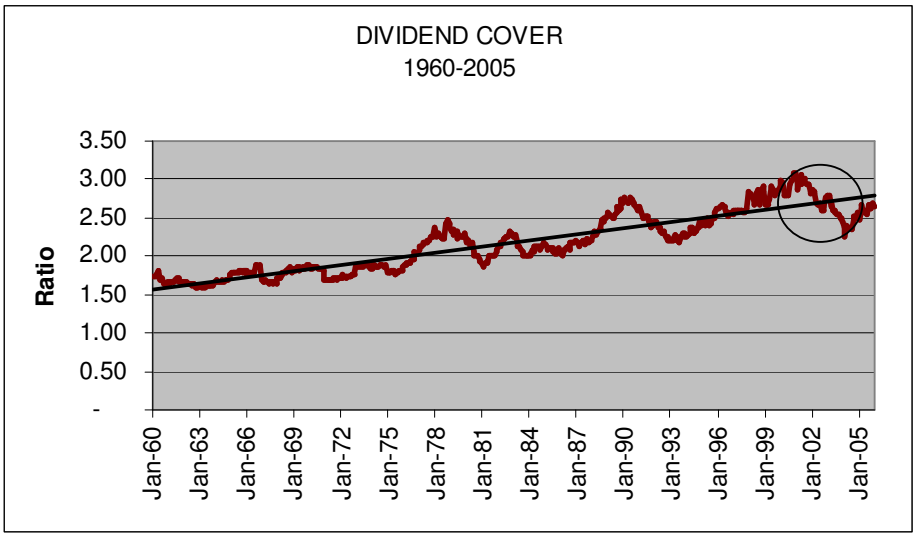

Figure 4: Dividend cover ratio

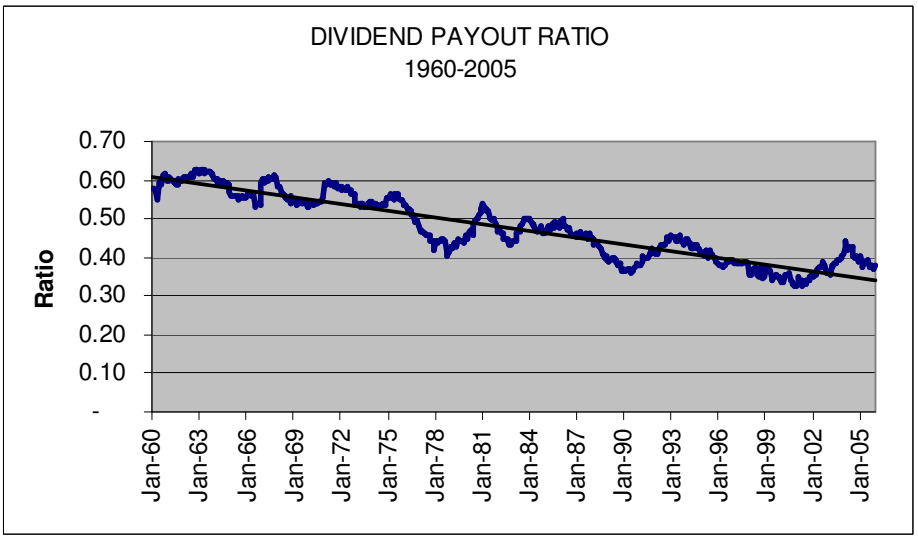

Figure 5: Dividend payout ratio

Figure 6 shows that the growth in dividends on a cumulative basis since 1960 outpaced inflation (as measured by CPI) by a considerable margin, emphasizing one of the real benefits of equity investing over the long term – generating an inflation-beating, tax-efficient income stream.

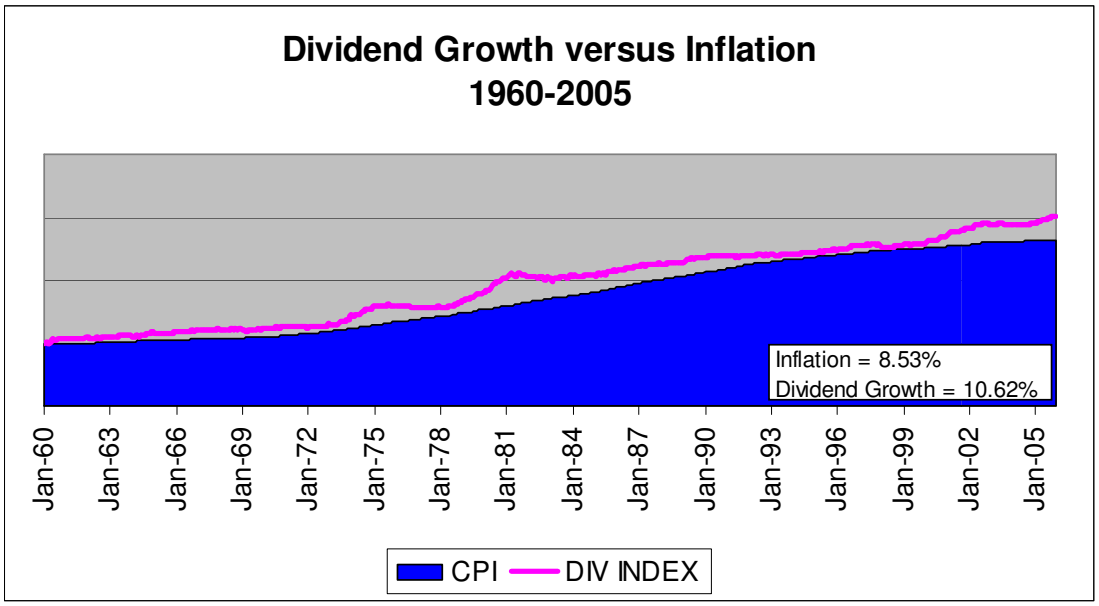

Figure 6: Dividend growth measured against inflation (CPI)

3.2. PE Rating Change

The change in the market rating of equity holdings is probably less relevant over the long term, as seen from its relative small contribution towards total equity return over the various long-term periods. The old adage of "market timing is not important, but time in the market" comes to mind.

However, rating change plays a major role whether investors will experience extraordinary, mediocre or disappointing equity returns. It is imperative to understand that whenever the investor is entering the market at relative expensive levels, the subsequent returns will be mediocre to disappointing. Conversely, if the market is relatively cheaply priced, the subsequent returns are more than likely to be rewarding for investors.

The earnings yield (earnings as a percentage of stock price) and it's well-known reciprocal, the price earnings multiple, are depicted in figures 7 and 8. From these it is evident that the market is currently trading at above-average valuation levels (PE = 16), but not yet at extreme ratios. Note that whenever one or two standard deviations on either side of the long-term average (11.5) are breached, some correction normally follows.

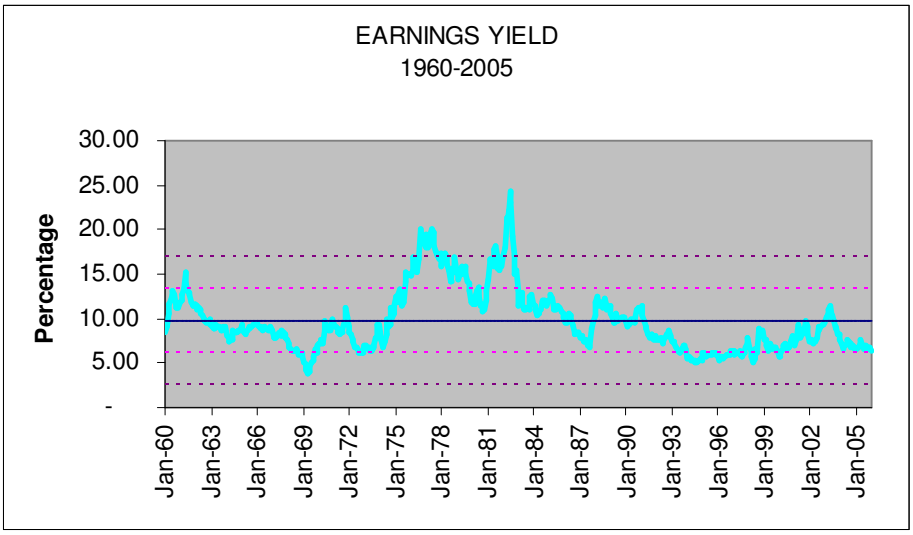

Figure 7: The earnings yield

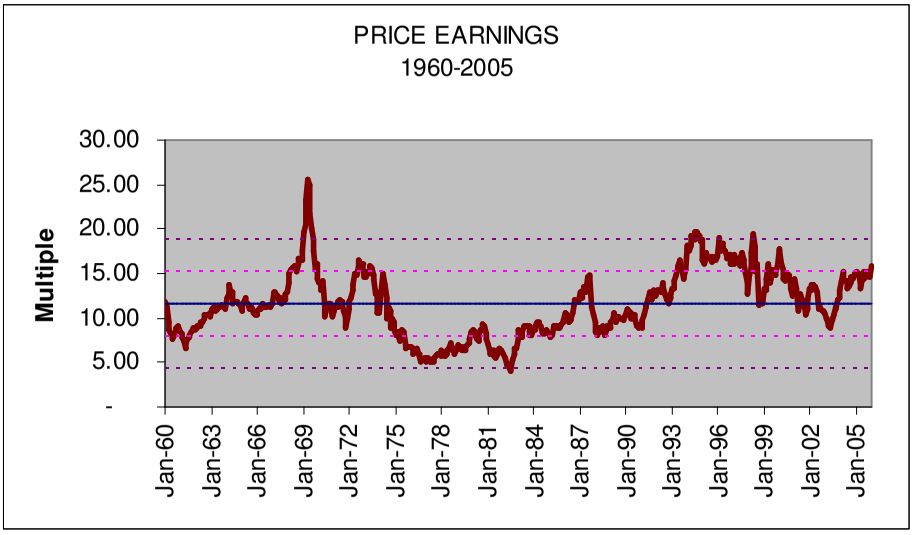

Figure 8: The price earnings ratio

3.3. Earnings Growth

Earnings growth is the most important component of equity return and has contributed between 60-70% of equity returns over the long term.

Figure 9 shows how closely correlated equity returns and earnings growth on a cumulative basis have been over time.

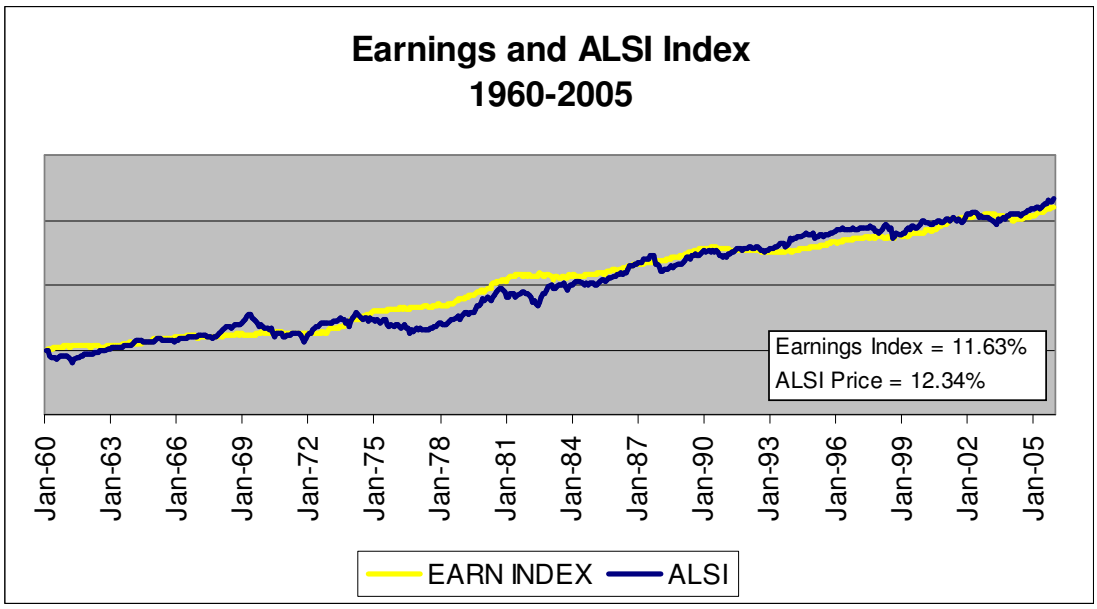

Figure 9: The cumulative growth in earnings and ALSI index

Figure 10 illustrates how volatile and cyclical earnings growth has been, especially since the mid seventies where it fluctuated between -20% and 60% per annum. Currently, earnings growth is peaking and based on the historical evidence of cyclical behaviour a downward correction is more than likely to follow in the foreseeable future.

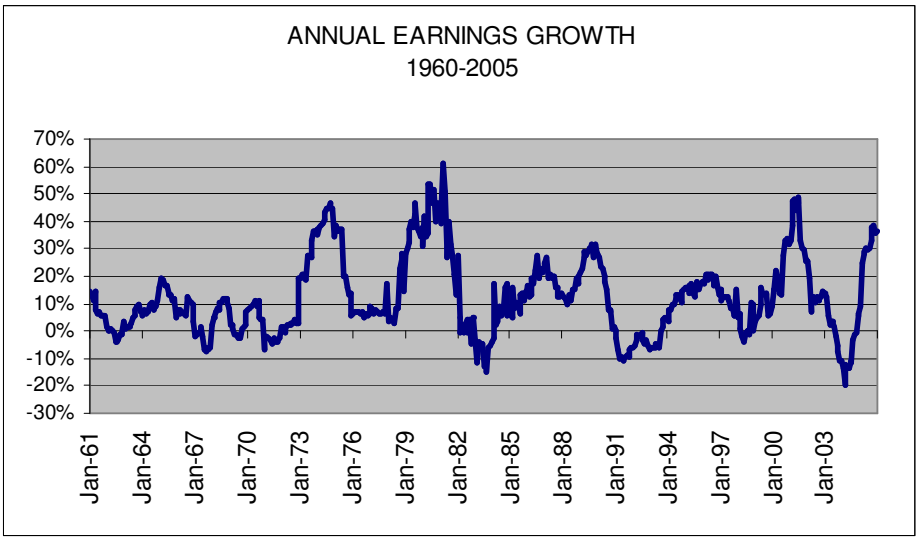

Figure 10: Annual earnings growth

The volatility of earnings growth is further demonstrated by the "bar codes" in figure 11. Since 1960 there were considerably more positive earnings growth periods with nearly twice the average duration size than negative earnings growth periods. However, note that negative earnings growth periods occurred quite regularly in between with the longest positive period totalling only 17 months. We are currently in an 8-month positive cycle.

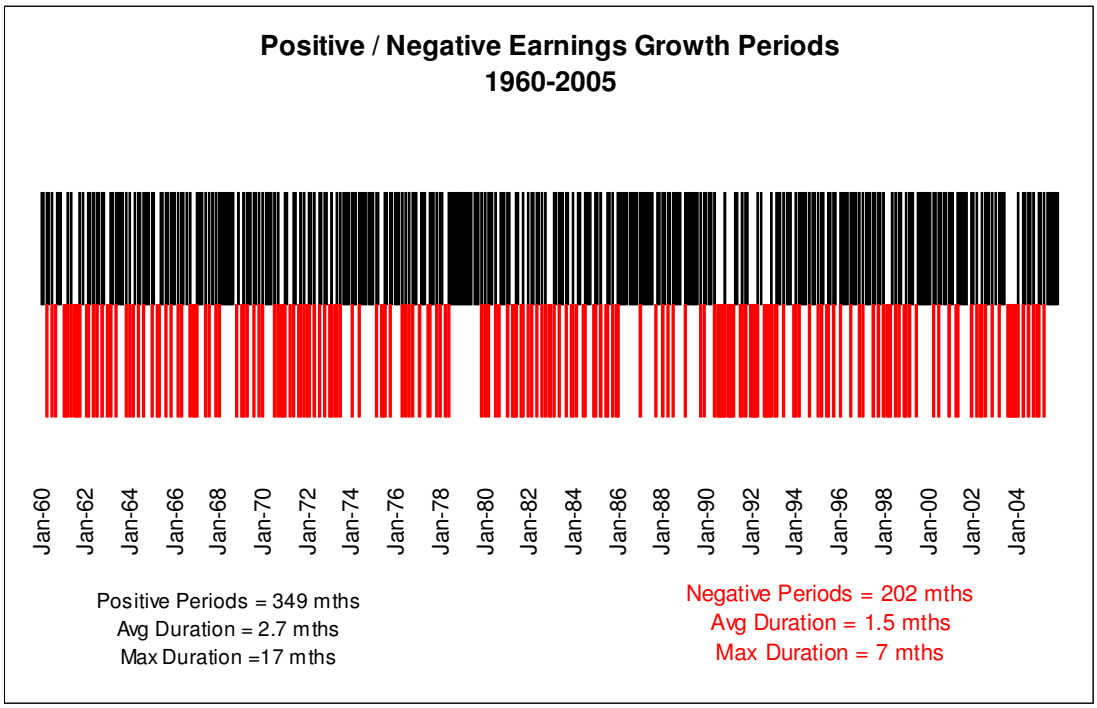

Figure 11: A comparison of positive and negative earnings growth periods

As with dividend growth, earnings growth has outperformed the official inflation rate (figure 12). With the increase in dividend cover (and drop in dividend payout ratio) from the mid seventies onwards, earnings growth outpaced dividend growth, yet this trend will probably revert as payout ratios have increased over the past five years, which is likely to continue in the foreseeable future.

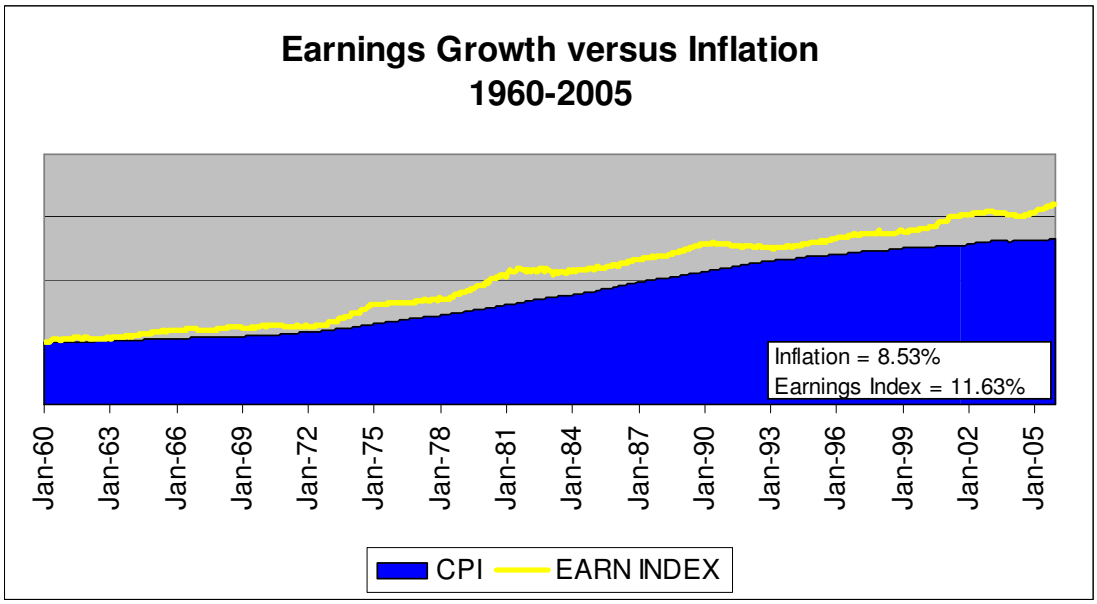

Figure 12: Cumulative earnings growth measured against inflation (CPI)

In general, inflation over the years had a weak, but positive influence on earnings growth, in other words companies could partially pass inflation on to consumers. Figure 13 shows this relationship between inflation and earnings growth from 1960 to 2005.

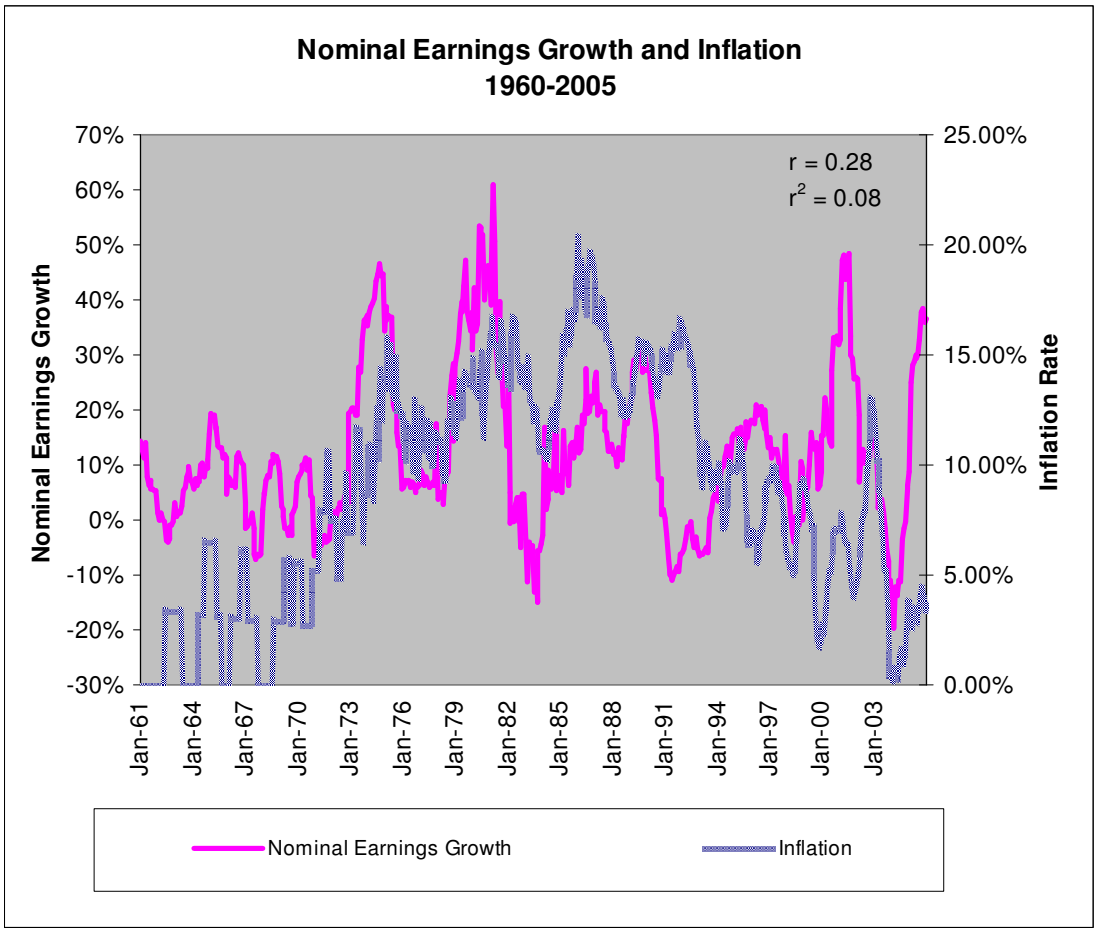

Figure 13: Earnings growth and inflation

Figure 14 shows the real earnings growth versus the nominal earnings growth per annum. Note that with the structural breakdown of inflation over the past few years, the difference between nominal and real growth evaporated, quite different from the period starting in the mid seventies and ending in the early 2000s.

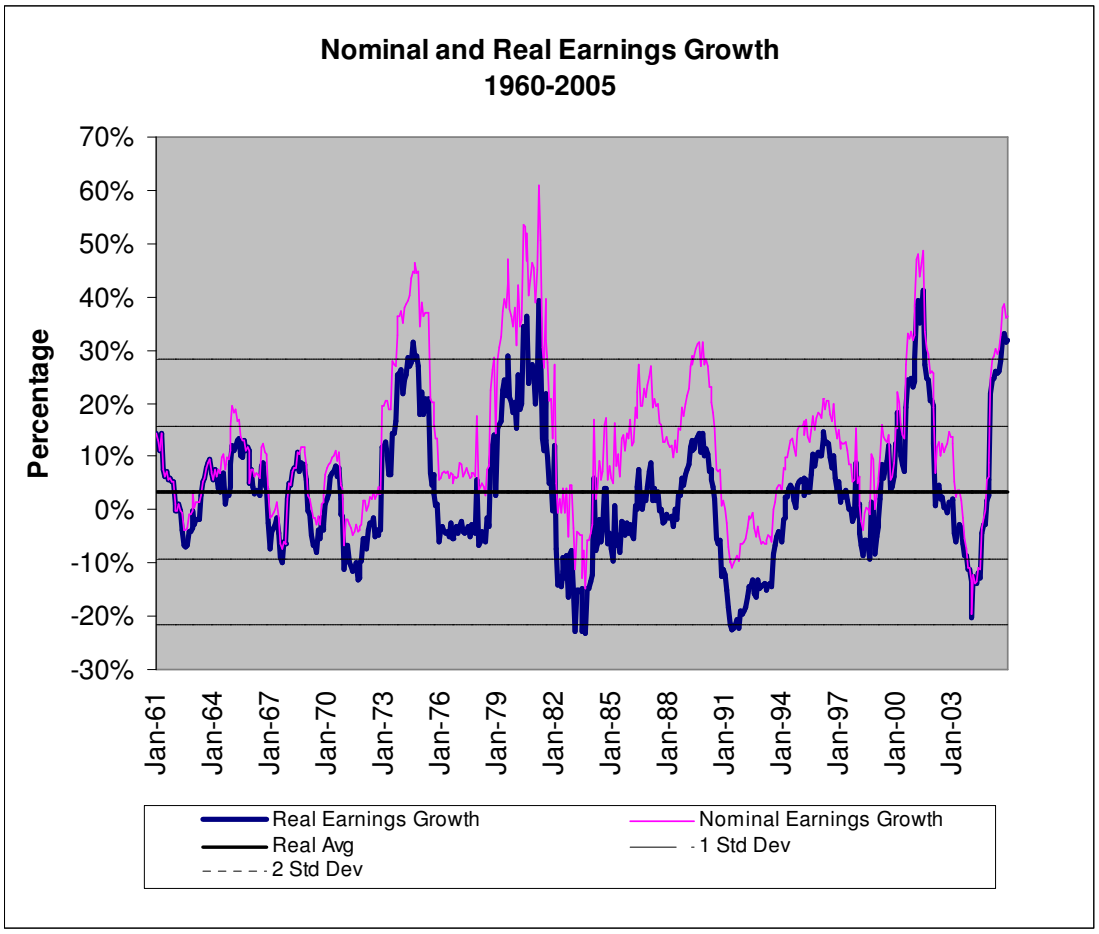

Figure 14: Nominal and real earnings growth

4. The Link between Earnings Growth, Stock Market Return and Economic Growth

Earnings growth is the most important determinant of equity return. The question arises whether one can safely assume that if earnings growth is positive, equity return will follow. Moreover, if a positive earnings growth can be expected in an economic environment conducive to consumer spending and business thriving, a positive link should exist between economic growth and equity returns. Thus, if the economy is growing, earnings growth would be positive and equity markets should be performing. Unfortunately, as we will see in this section, no such straight-forward conclusion can be made.

Figure 15 demonstrates a positive, but weak relationship (0.26 correlation factor) between earnings growth and stock market return. Basically, no conclusive evidence exists that if earnings growth is currently positive, stock market returns should be positive!

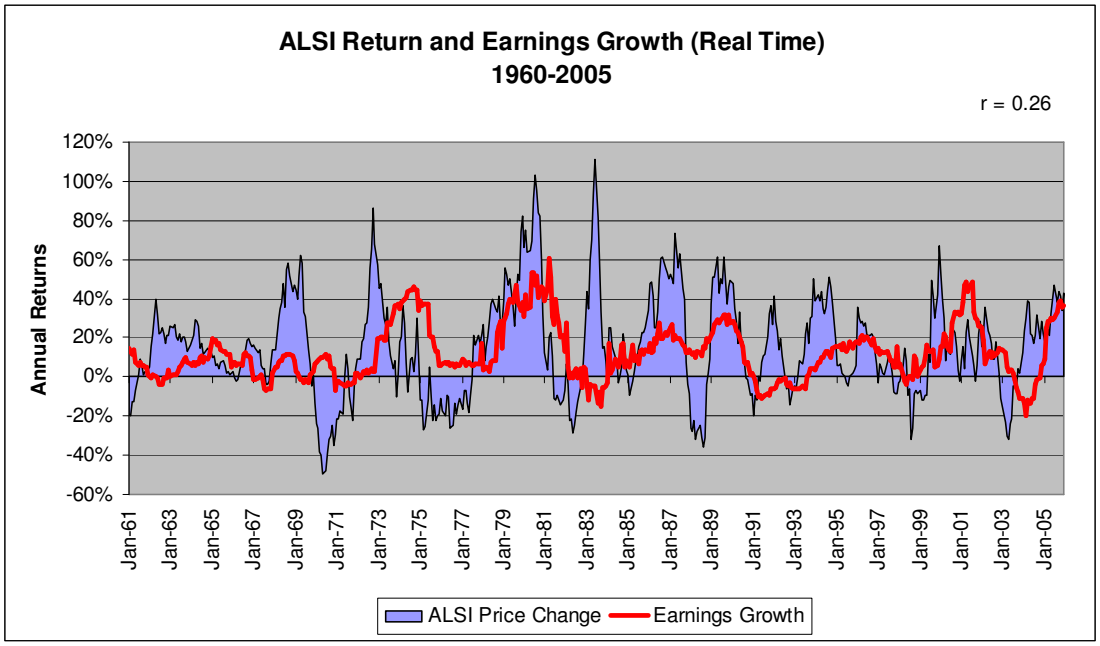

Figure 15: The correlation between ALSI equity return and earnings growth

To this effect it is important to understand the psychology of the stock market. In general it is a forward-looking mechanism, which is trying to predict the future profitability of companies and how day-to-day events might impact that future profitability (or in streetwise terminology – the market is discounting companies' future profitability).

In figures 16 and 17 the efficiency of the stock market in predicting future earnings is evaluated. If, for example, the current equity market movements are plotted against earnings growth data six months (or 12 months) in advance, we find a very strong positive correlation; in both cases a 0.76 correlation factor [Alternatively, one could have used current earnings growth and compared that with the equity market performance six or twelve months ago].

One valuable lesson can be learned from this exercise. The market may not predict future profitability with pin-point accuracy, but nonetheless very efficiently. Do not underestimate the market's collective wisdom and insight, and be very sure that if you bet against the market you have an edge on the market, otherwise simply invest in the market.

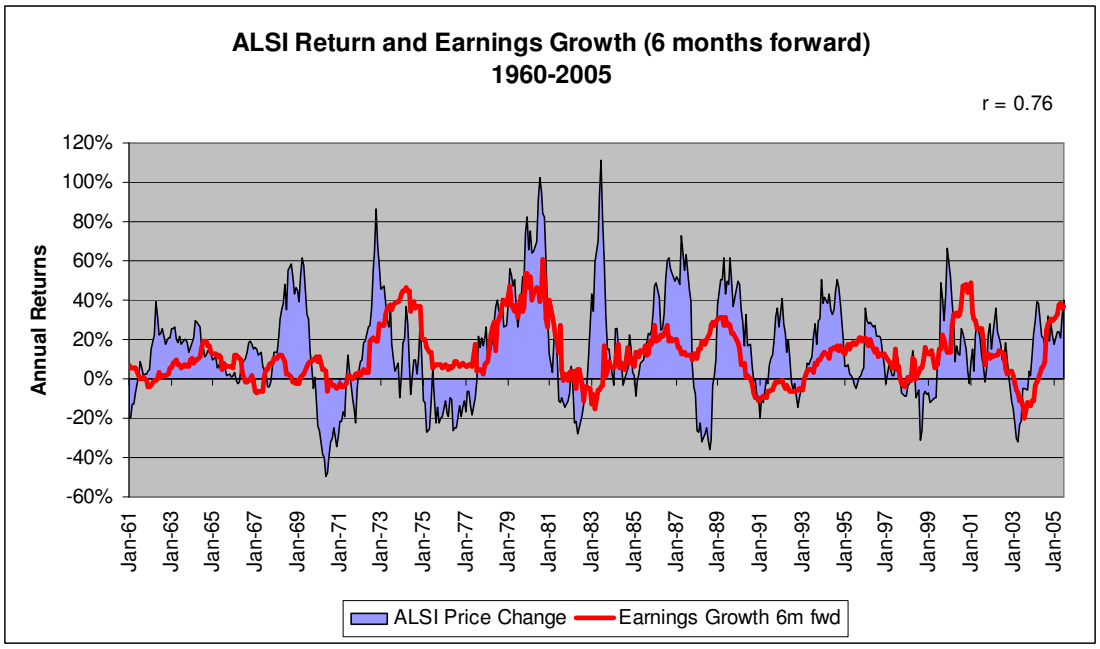

Figure 16: The correlation between ALSI equity returns and earnings growth 6 months in advance

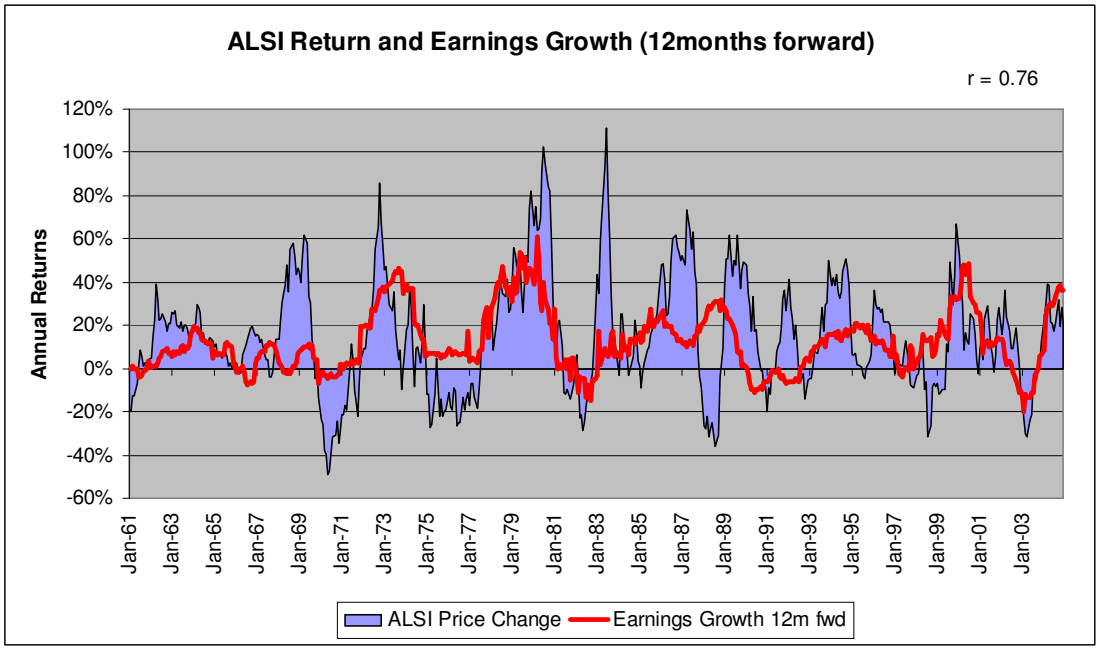

Figure 17: The correlation between ALSI equity returns and earnings growth 12 months in advance

How does earnings growth (on a real basis) and economic growth (real GDP growth) relate? Figure 18 illustrates that a much better statistical fit (0.45 correlation factor) is found between these two factors than between earnings growth and stock market return (0.26 correlation factor). In general, one can assume that a favourable economic climate will be conducive to earnings growth.

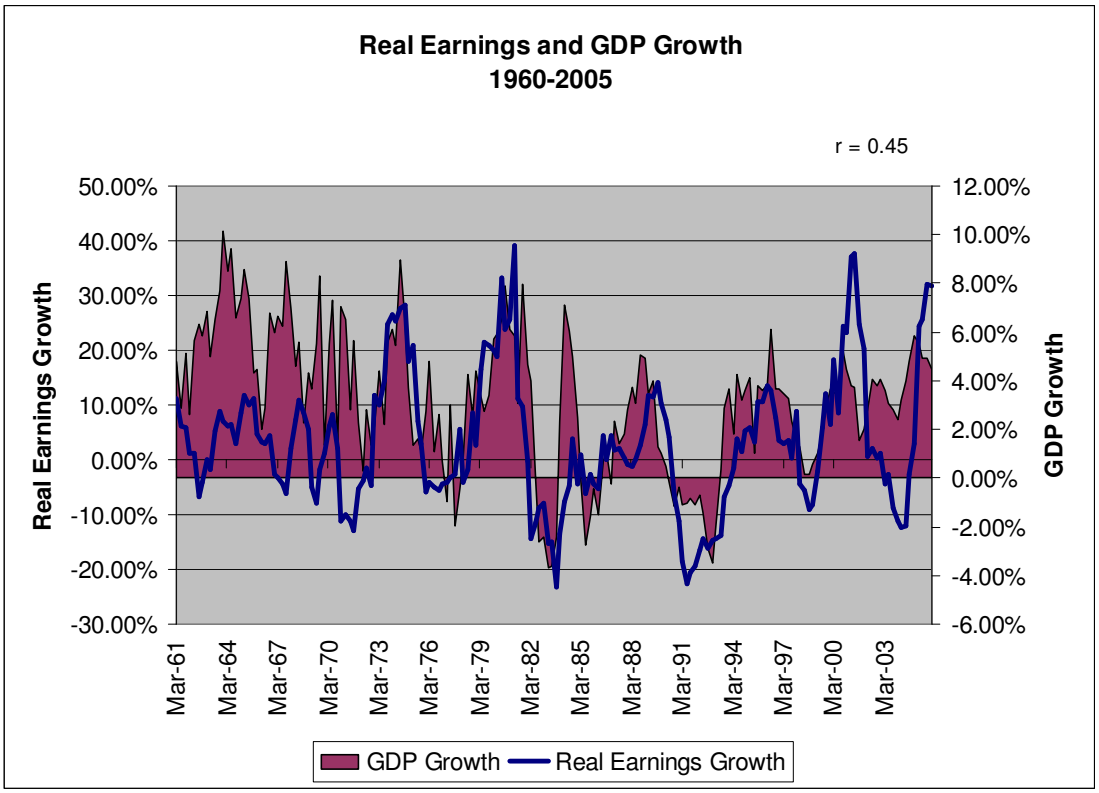

Figure 18: The correlation between real earnings growth and economic growth (GDP)

Investment experts and analysts often make the mistake in anticipating earnings growth way above the nominal economic growth. For example, if the nominal economic growth is expected to be 10% (GDP growth of 5% and inflation 5%), one cannot expect earnings growth to be at, say, 20%; thus twice the nominal growth rate of the economy. It might be valid for a year or two or maybe in some high-growth sectors of the market, but not for the market as whole or for an extended period of time.

Figure 19 illustrates that over the long term the stock market's earnings growth has been growing at a lower rate than the economy. It make sense since the companies listed on the stock market is part and parcel of the economy. Furthermore, some dilution will take place as companies are continuously investing in the development of new technologies and ventures, of which some will be complete failures.

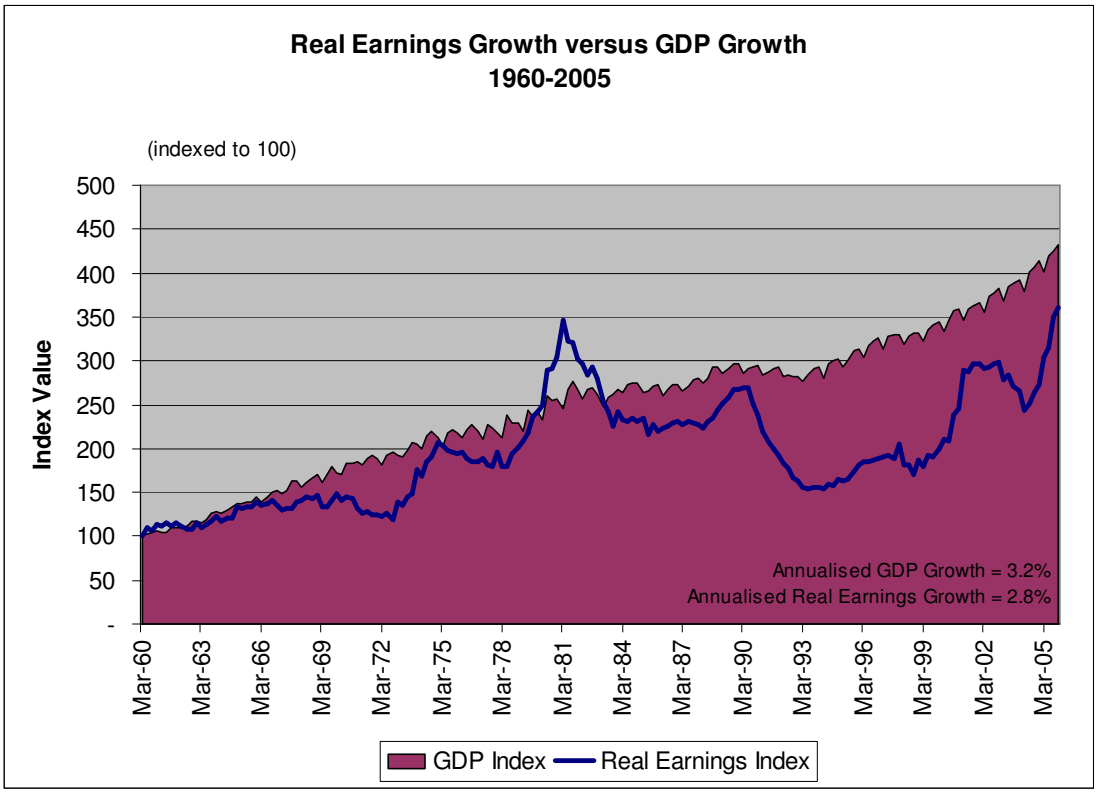

Figure 19: Real earnings growth versus economic growth (GDP)

A further misconception found in the marketplace is to assume that if the economy is doing well, stock markets should also be doing well. However, that is not unambiguously true. In figure 20 equity returns over the past 46 years were regressed on GDP growth and no statistically significant evidence could be found that the state of the economy predicts stock market return. (The horizontal line indicates there is no linear relationship between the variables).

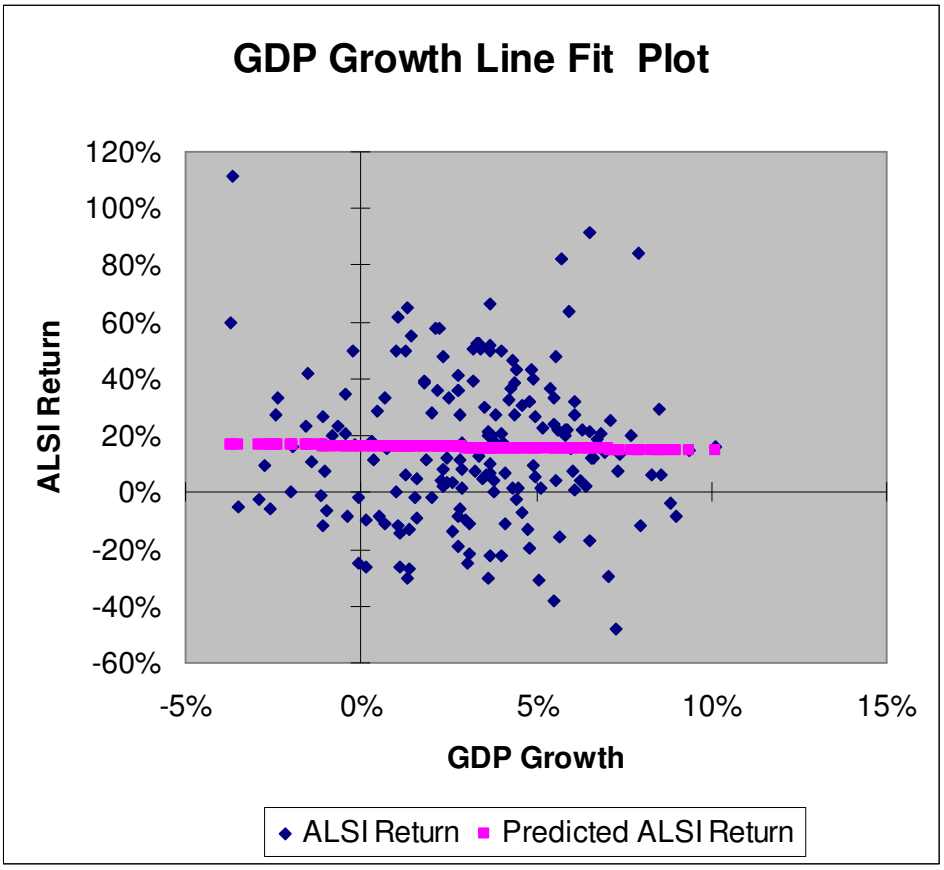

Figure 20: Regression analysis of equity market return and GDP growth

However, some positive correlation exists between equity returns and future economic growth. The current equity market return can predict, albeit weak, but statistically significant, future economic growth. In figure 21 this positive relationship is shown, where in general a buoyant stock market predicts higher economic growth 12 months forward.

The converse also holds (figure 22). Higher economic growth seems to lead to higher equity returns 12 months down the line. But again, the correlation is weak (moderate linear relationship) and great care should be taken to depend too much on this relationship to make any reliable forecast.

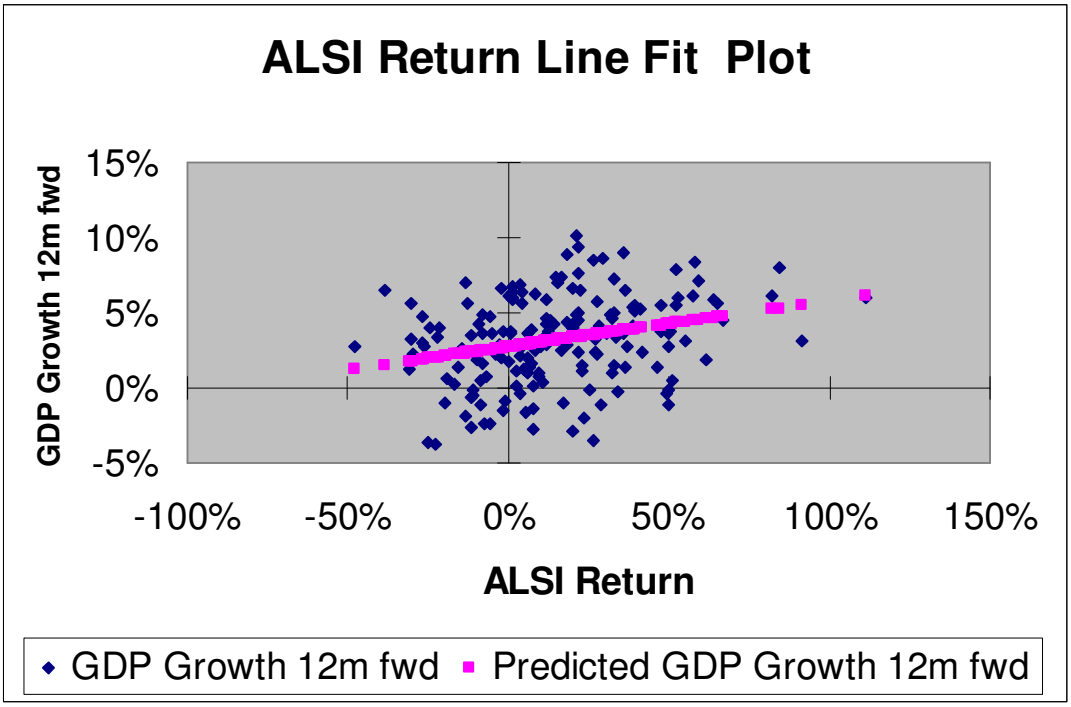

Figure 21: Regression analysis of equity market return and GDP growth 12 months forward

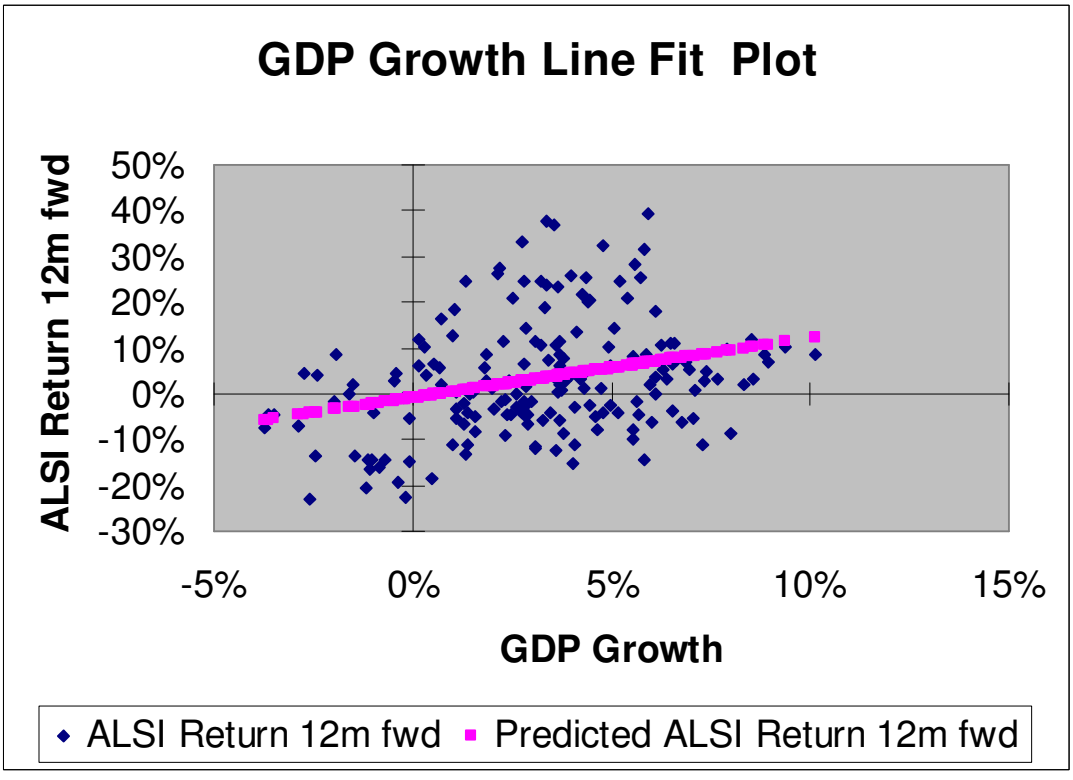

Figure 22: Regression analysis of GDP growth and equity market return 12 months forward

5. Equity Return: Future Expectations

By applying the quantitative model used in this analysis (equation 1) one can construct a matrix of expected returns at various earnings growth and PE multiple assumptions (see table 1, page 26).

Figure 23 demonstrates a range of various outcomes at different earnings growth and PE assumptions. For example, if the market's earnings growth is expected to be 20%, a dividend cover of 2.5 is maintained, and with a PE rating of 16, the corresponding return from the market is expected to be more than 30%.

Going forward, some realism is required to make meaningful predictions on future equity returns. First, regarding an expected PE multiple. Currently, the market's PE is at 16 against the long-term average of about 12. Over the past 15 years the average PE has been 14, which incidentally has been the period the South African economy has become "normalised" and a much more open market. I tend to place more emphasis on the latter period, therefore I will be content to use a PE multiple of 14 as the basis of my long-term return forecasts.

Second, earnings growth tends to be volatile with an average growth rate of 10% and a standard deviation of 14% over the past 15 years (from 1960 the long-term average has been 12%). Moreover, we have seen that earnings growth over the long term is actually lower than the nominal economic growth (see figure 19). Thus, if we assume that South Africa can continue on a stable path to prosperity with an economic growth of 5-6% and inflation limited to 5%, at best one can expect earnings growth to average 10% per annum.

Using these two parameters – PE at 14 and earnings growth at 10% – one can infer from table 1 and figure 23 that a realistic long-term return of a modest 5-6% per annum can be expected. If for some reason one would expect the PE ratio to average out at higher levels (PE = 15 or 16) in the future, the expected return increases to 13-20% per annum.

However, while a long-term PE of 15 might still be viable, assuming that our long-term PE rating should be 16 or more might be a bit rich, given our structural deficiencies in the economy and huge socio-economic backlogs. Hence, I will settle for equity returns to realise anything between 5% and 15% in the long run.

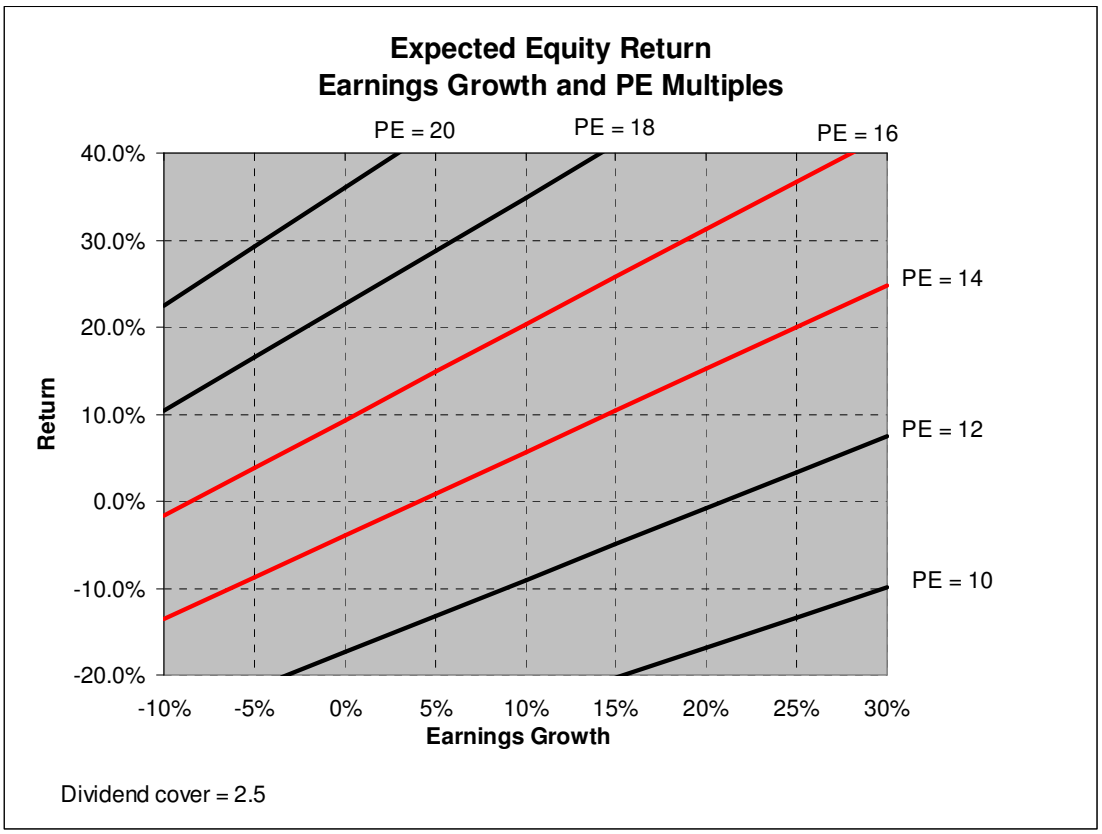

Figure 23: Expected equity return at different earnings growth and PE ratio assumptions

Table 1: The expected payoff on equity investments at various earnings growth and PE ratios

	Price/Earning Multiple												
Earnings Growth	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
-10%	-49.6%	-43.6%	-37.6%	-31.6%	-25.6%	-19.6%	-13.6%	-7.6%	-1.6%	4.4%	10.4%	16.4%	22.4%
-5%	-46.8%	-40.5%	-34.1%	-27.8%	-21.5%	-15.1%	-8.8%	-2.5%	3.9%	10.2%	16.5%	22.9%	29.2%
0%	-44.0%	-37.3%	-30.7%	-24.0%	-17.3%	-10.7%	-4.0%	2.7%	9.3%	16.0%	22.7%	29.3%	36.0%
5%	-41.2%	-34.2%	-27.2%	-20.2%	-13.2%	-6.2%	0.8%	7.8%	14.8%	21.8%	28.8%	35.8%	42.8%
10%	-38.4%	-31.1%	-23.7%	-16.4%	-9.1%	-1.7%	5.6%	12.9%	20.3%	27.6%	34.9%	42.3%	49.6%
15%	-35.6%	-27.9%	-20.3%	-12.6%	-4.9%	2.7%	10.4%	18.1%	25.7%	33.4%	41.1%	48.7%	56.4%
20%	-32.8%	-24.8%	-16.8%	-8.8%	-0.8%	7.2%	15.2%	23.2%	31.2%	39.2%	47.2%	55.2%	63.2%
25%	-30.0%	-21.7%	-13.3%	-5.0%	3.3%	11.7%	20.0%	28.3%	36.7%	45.0%	53.3%	61.7%	70.0%
30%	-27.2%	-18.5%	-9.9%	-1.2%	7.5%	16.1%	24.8%	33.5%	42.1%	50.8%	59.5%	68.1%	76.8%

Assumption: Dividend cover = 2.5

6. Conclusion

This study has shown that the absolute levels of equity returns are predominantly influenced by movements in the PE ratings of the market, even though earnings growth has been responsible for the bulk of equity returns over time. Currently, our PE rating is at 16 and still heading upwards. Earnings growth is running at 35% and more. Thus, both numbers are significantly above the long-term expected ratios. This implies some correction will more than likely follow the recent spikes, and hence there is a real chance that equity returns over the short to medium term may disappoint, especially if earnings growth and the PE rating are heading downwards in tandem. For example, note from table 1 how much the expected return will drop with a re-rating of the market from 16 to 15 or even 14.

Just before you rush off to cancel your equity investment plan, you have to consider that the prospects for alternative asset classes might be even worse than for equities. The outlook for bonds and especially properties are not rosy at all since those asset classes are priced for perfection. Therefore, I will prefer equities as my major source of creating wealth for the longer term.

My reasoning above is based on the premise that valuation levels over time reverts back to some mean. Unless the world we live in and somehow understand, have changed permanently to one that does not appropriately price for risk, that premise holds. If so, the phrase “this time it is different” is really convincing. However, I tend to be very sceptical whenever I hear or read this. Looking back at the history of financial markets, more often than not these notorious words have been followed by some catastrophes!