



## Interest Rates and Equity Returns: An Inverse Relationship?

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July 2007

Available at: [www.indexinvestor.co.za](http://www.indexinvestor.co.za)

### 1. Introduction

In June 2007 the Monetary Policy Committee (MPC) of the South African Reserve Bank “unexpectedly” increased the Reserve Bank’s “repo” interest rate, which is used as the primary indicator or determinant of interest rate levels in the economy. This last move was the fifth increase of 50 basis points (250 basis points in total) since June 2006. It was “unexpected” since the MPC in two previous meetings (February and April 2007) decided to put further rate hikes on hold despite resilient private sector credit and money supply (M3) growth. Perhaps the MPC felt at the time that the inflation outlook remained relatively benign with especially oil prices at the time hovering around \$60 a barrel.

However, inflation data released towards the end of May 2007 proved the Reserve Bank’s previous “optimistic” inflation expectations wrong and the MPC had virtually no choice but to hike interest rates again. Moreover, central banks in other major economies of the world tightened their monetary policy. For example, the Bank of England raised interest rates in June in response to above-target inflation levels. The European Central Bank made it clear that it would be keeping a close watch on inflation trends and would not hesitate to hike interest rates if necessary. The Federal Reserve in the U.S. remains uncomfortable with inflation trends and will in all likelihood not lower interest rates for some time still.

Globally, we are in a rising interest rate cycle in response to rising inflation trends, predominantly led by high oil and commodity prices, especially food prices, aggravated by some production capacity constraints. Inflation data, together with other macro-economic statistics forthcoming in the next couple of months, will determine how far the MPC still has to go in hiking interest rates. The fact is, consensus opinion about interest rates has changed with a lot more uncertainty than before about when and after how many rate hikes the cycle will end.

In these uncertain times concerns how further interest rate hikes will affect economic growth, and then more specifically equity market returns, are inevitable. We know that rising interest rates should have a slowdown effect on the economy, which could even lead to economic recessions if such interest rate hikes are persistent and harsh. All in all, conditions that do not bode well for equity returns.

Despite the 250 basis points rate hikes thus far, the returns from the local equity market have not retracted significantly. In fact, the opposite happened, simply because the earnings growth of the majority of listed companies have been and remain spectacular (obviously partly due to the fantastic and continuous bull market in commodity prices).

The begging question is: Is there a “point of no return”? In other words, is it only a matter of time before the cumulative interest rate hikes will be adversely affecting companies’ turnover and profit margins? Or, if we experience, say, another 100 basis points hike in interest rates, will consumer and business confidence be significantly dented which will spill over to lower return expectations?

In this study I shall endeavour to investigate how interest rates in the past affected equity returns. Specifically, how did the stock market perform during cycles of high and low interest rates? How did the stock market react to changes in interest rates – whether the rate changes occurred gradually or rapidly? How did such interest rate changes affect companies’ profit growth and their expected future profitability (market rating)?

For the purpose of this study the prime lending rate (the best rate at which money could be borrowed from financial institutions) was used as proxy for the cost of borrowing in the market place and serves as the benchmark for interest rate movements in the past. The FTSE/JSE All Share Index data from 1960 to April 2007 were used to evaluate the effect of past interest rate cycles on equity returns.

## **2. Prime Lending (Overdraft) Rates**

Historically, interest rates have been low and relatively stable in the 1960s and 1970s, but very volatile during the inflationary economy, which started to evolve in the mid 1970s, through the 1980s and 1990s, but showing a significant downwards trend from the end of the 1990s.

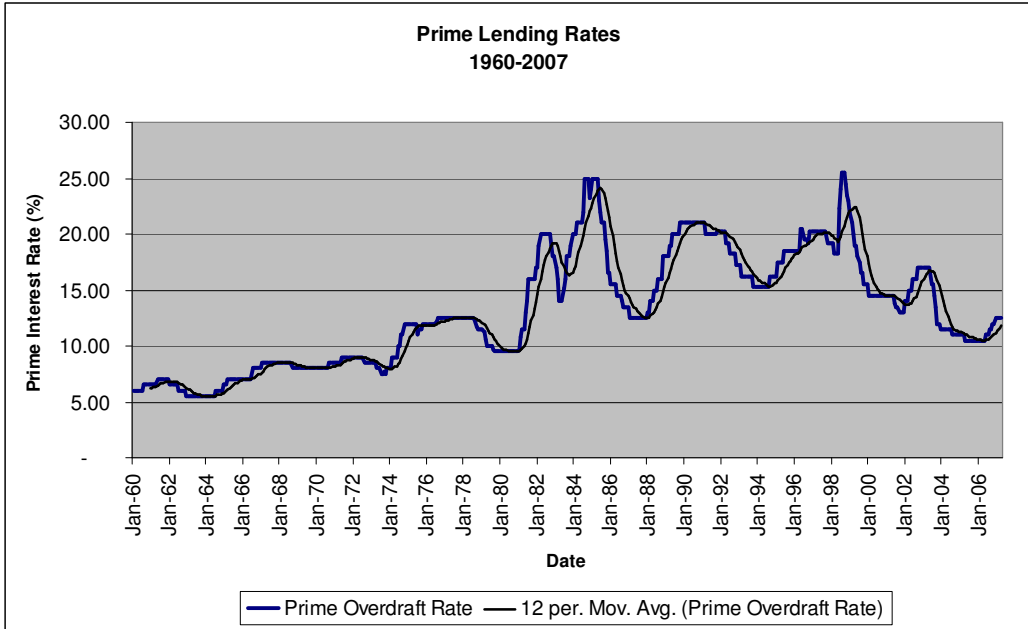


Chart 1: Prime lending rates in the South African economy

The Reserve Bank uses interest rates as an instrument to control inflationary pressures in the economy, but until the late 1980s it was not effectively managing inflation (chart 2). Since then the Bank successfully implemented a monetary policy of high real interest rates while in later years adopting an inflation-targeting policy. Chart 3 illustrates how closely aligned interest rates have become in response to inflation trends over the past two decades.

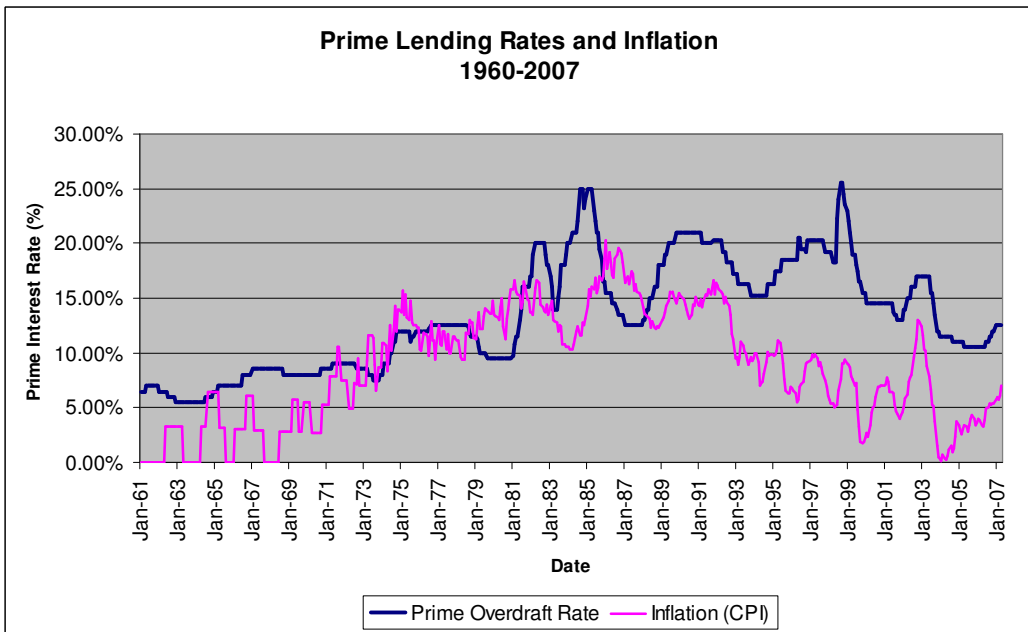


Chart 2: Prime lending rates and inflation

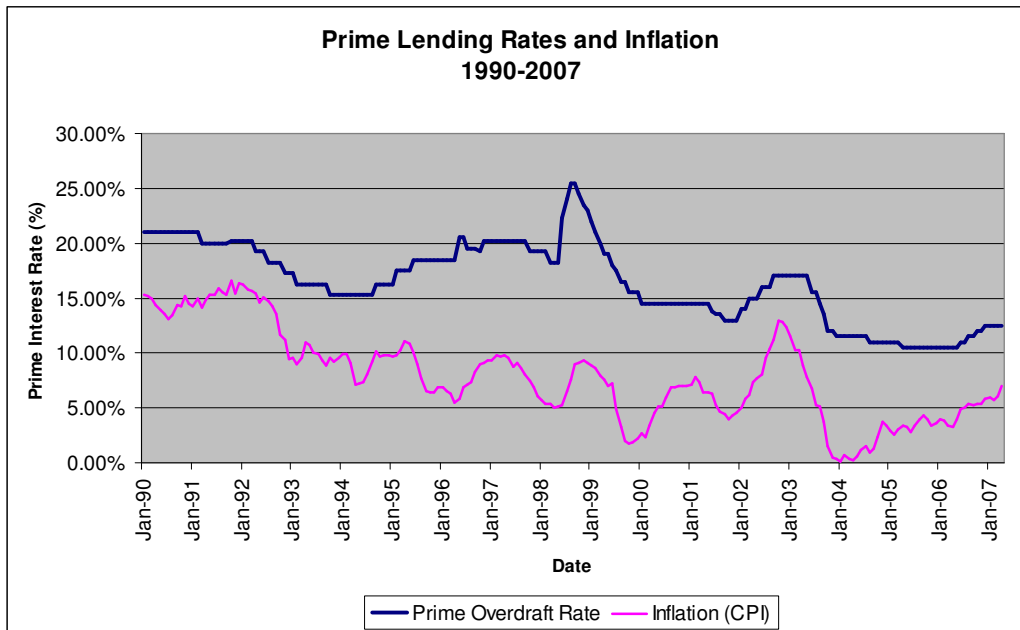


Chart 3: Monetary policy since the 1990s

### 3. Prime Lending Rates and Stock Market Returns: Historical Evidence

Interest rates should affect both the demand and the supply side of the economy. First, via the propensity of consumers to change their spending patterns and/or to acquire more/less debt to finance demand, and second, through the cost to producers and manufacturers to expand their production capacities in meeting consumer demand.

Thus, interest rates should have a direct bearing on economic growth in general, and since equity returns follow economic growth in the long run, one should expect some adverse relationship between equity returns and interest rates.

What evidence does history provide us when evaluating this hypothesis?

Chart 4 exhibits the FTSE/JSE All Share Index returns from the 1960s until April 2007, expressed on a 12-month rolling basis versus the prime lending interest rate over the same period.

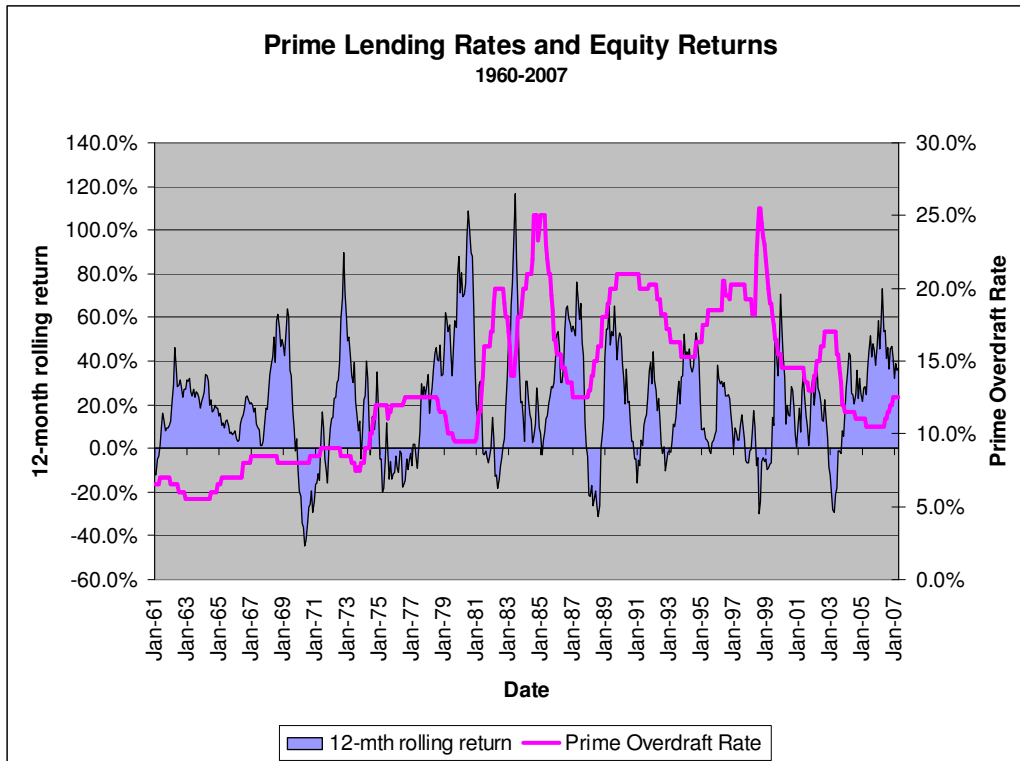


Chart 4: Prime lending rates and JSE ALSI returns

While it appears that interest rates from time to time had an adverse effect on equity returns, the relationship is statistically not significant (correlation coefficient of -0.14).

Moreover, consider the following statistics in table 1:

Table 1: Average equity market returns over the past decades

Period	Average Prime Overdraft Rate	Average Annual Return
1960s	7.1%	21%
1970s	10.3%	14%
1980s	16.5%	31%
1990s	18.9%	15%
2000-	13.1%	25%

More specifically; the period 1960-1980 could generally be described as a low-inflation, low-interest rate period with an average prime rate of 8.75% while equity investments yielded 17% per annum on average. In contrast, the average prime rate over the ensuing period, 1980-2000 was 17.7%, yet equities yielded an average return of 23% per annum. Thus, it does not appear that periods of high interest rates *per se* have had a significant adverse effect on equity returns. Alternatively, periods of low interest rates did not imply significantly better equity returns than periods of high interest rates.

#### 4. Changes in Interest Rates

While it may be true that over the long term (ten years and more) the interest rate level – whether generally high or low – did not show significant inverse effects on subsequent equity returns, it is more than likely that over such a time span interest rates went through both rising and declining cycles.

Therefore, to investigate specifically what effect periods of rising or declining interest rates have had on equity returns, time spans where significant interest rate changes did occur were identified together with the annualised equity returns realised over those periods. The data are shown in table 2 and graphically displayed in chart 5.

Table 2: Periods of significant rate changes and subsequent equity returns

Period	Interest Rate Change (PP)	Annualised Equity Return
Oct 1973 - Jul 1978	5.00%	2%
Jul 78 - Dec 1980	-3.00%	47%
Dec 1980 - Sep 1982	10.50%	-4%
Sep 1982 - May 1983	-6.00%	54%
May 1983 - Apr 1985	11.00%	7%
Apr 1985 - Dec 1987	-12.50%	21%
Dec 1987- Feb 1991	8.50%	14%
Feb 1991 - Aug 1994	-5.75%	23%
Aug 1994 - Sep 1998	10.25%	-3%
Sep 1998 - Dec 2001	-12.50%	27%
Dec 2001 - May 2003	4.00%	-18%
May 2003 - May 2006	-6.50%	33%

From this analysis it appears that significant interest rate changes from one period to another did affect equity returns; typically, a period of declining interest rates could be associated with strong equity returns while the converse held true in a rising interest rate cycle. Note that the relationship does not appear proportionally or linearly, i.e. large movements in interest rates did not necessarily lead to similar, large positive or negative returns from the equity market.

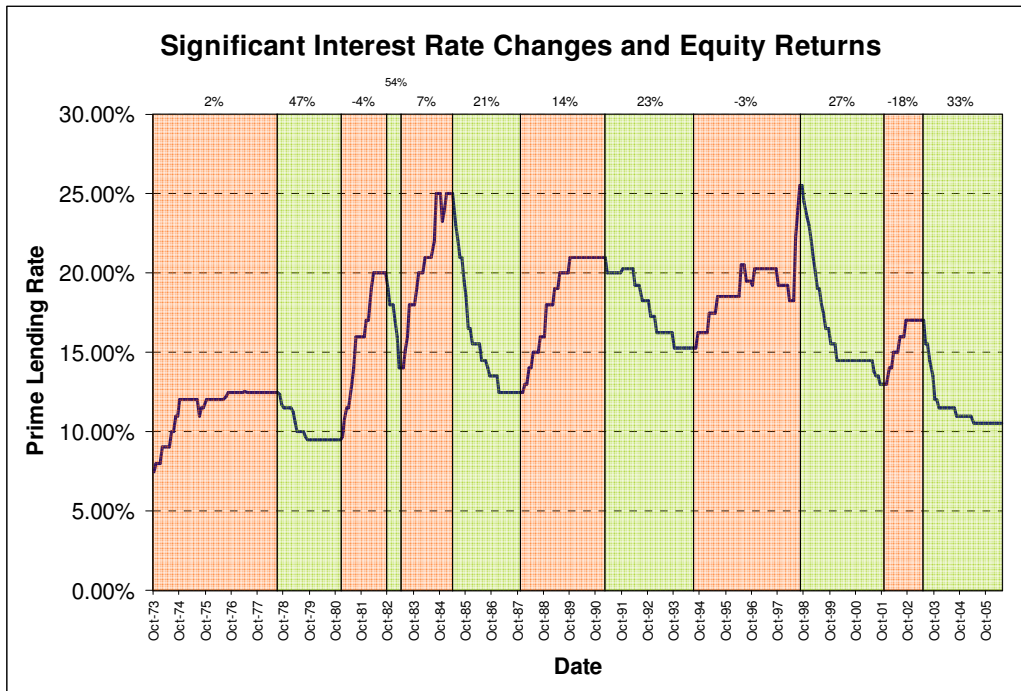


Chart 5: Interest rate cycles and equity returns

An alternative method is to consider the relative change in interest rates on annual equity returns, and more specifically its direct or lagged impact on companies' profit growth and future profitability trends.

For example: In the beginning of any year the prime lending rate is 10%. During the year the Reserve Bank increases rates by 2% and by year-end the prime rate is 12%. The cumulative interest rate change over this 12-month period (2 percentage points) is compared with equity returns over the same period. This process is then repeated over rolling 12-month periods.

The cumulative interest rate change over a 12-month rolling period is shown in chart 6. Hereby significant rate changes – upwards and downwards – can be identified and their impact on subsequent equity returns can be highlighted (charts 7 and 8).

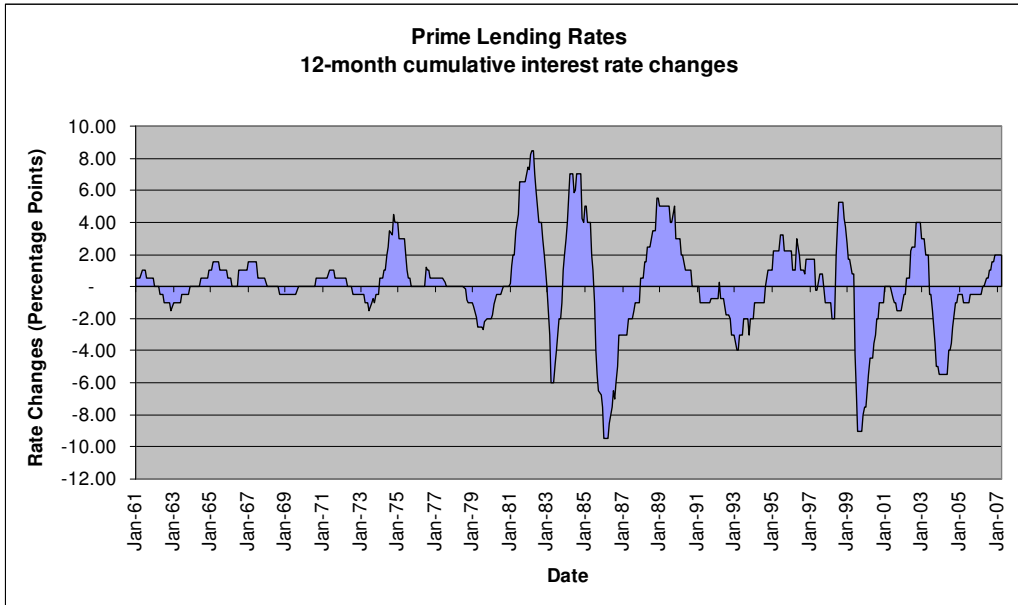


Chart 6: Cumulative changes in prime lending rates over 12-month rolling periods

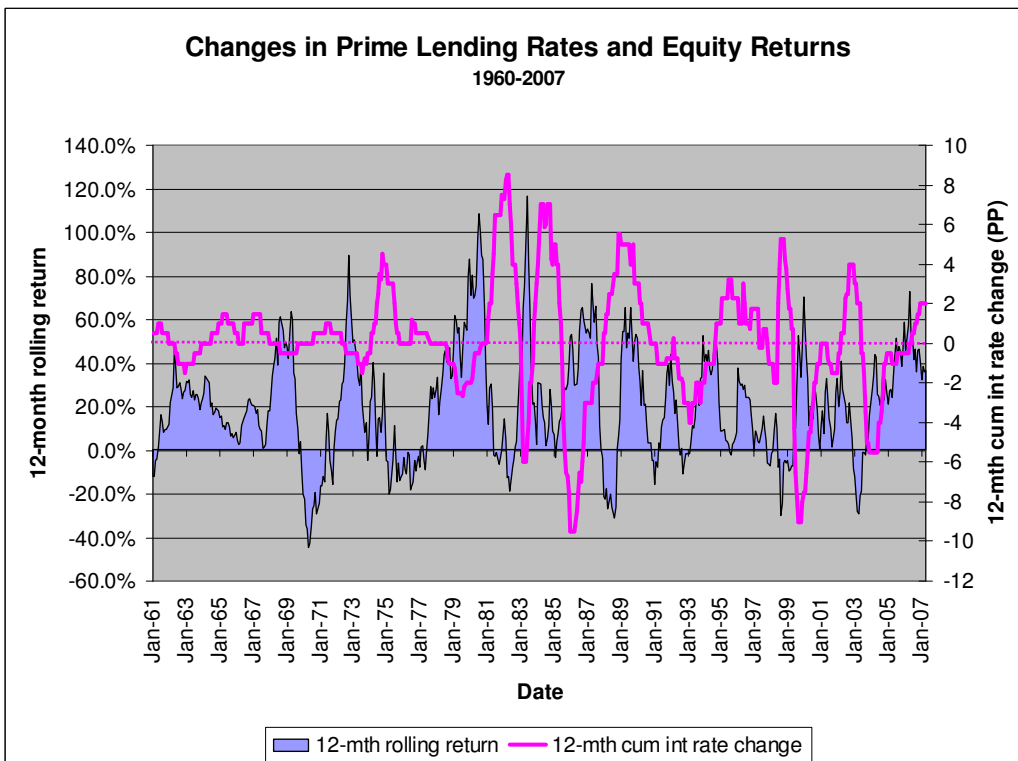


Chart 7: Changes in interest rates and subsequent equity returns (1960-2007)



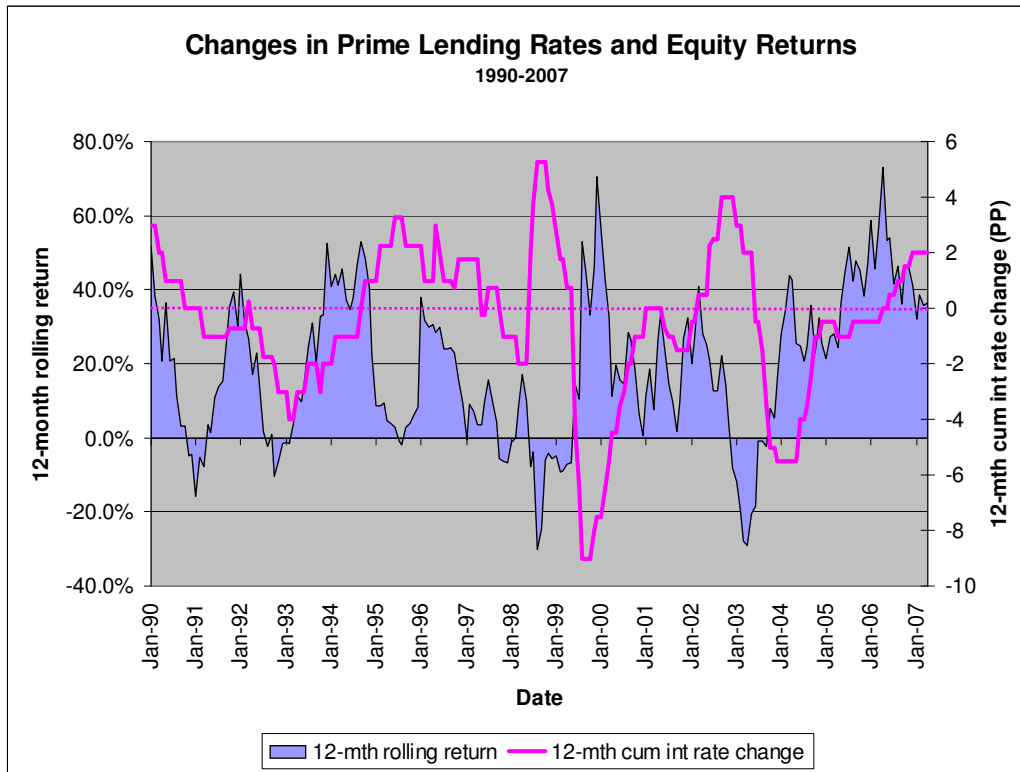


Chart 8: Changes in interest rates and subsequent equity returns (1990-2007)

Charts 7 and 8 show some inverse relationship between the change in interest rate movements and equity returns over the past four decades (correlation coefficient of -0.30).

Alternatively, the above relationship can be plotted on an X-Y chart as shown in chart 9 and the best-fitted line (solid line) again indicates a mild inverse correlation between interest rate changes and equity returns.

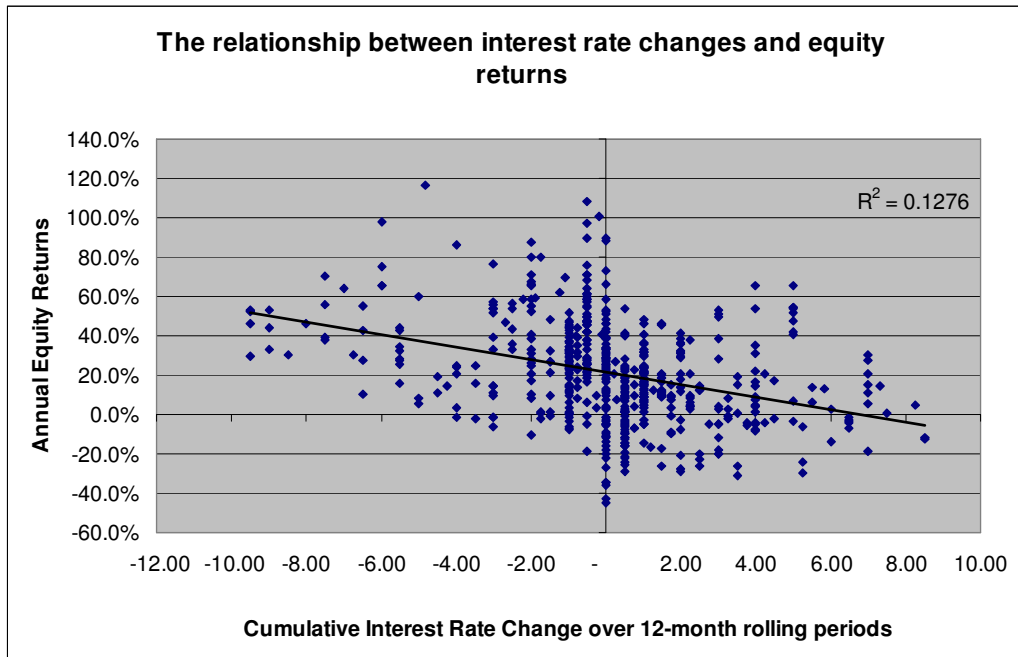


Chart 9: The relationship between cumulative interest rate changes and equity returns

Table 3 displays the frequency and level of interest rate movements – from 8% and more downward to more than an 8% upward rate adjustment – over consecutive 12-month periods together with the average annual equity returns observed during those periods. This information is graphically displayed in charts 10 and 11.

Table 3: The impact of interest rate changes on equity returns

Cum. Int. Rate adjustment	Frequency	Avg. Return	Best Return	Worst Return
-8	2%	43.2%	53.3%	29.9%
-6	3%	52.7%	98.2%	10.4%
-4	4%	30.7%	116.6%	-1.6%
-2	8%	37.0%	87.7%	-10.5%
0	38%	26.5%	108.5%	-44.7%
2	28%	10.5%	53.9%	-29.3%
4	10%	7.7%	65.3%	-31.2%
6	4%	18.4%	30.5%	-30.0%
8	3%	6.4%	30.5%	-18.5%
>8	1%	-6.7%	4.6%	-12.7%

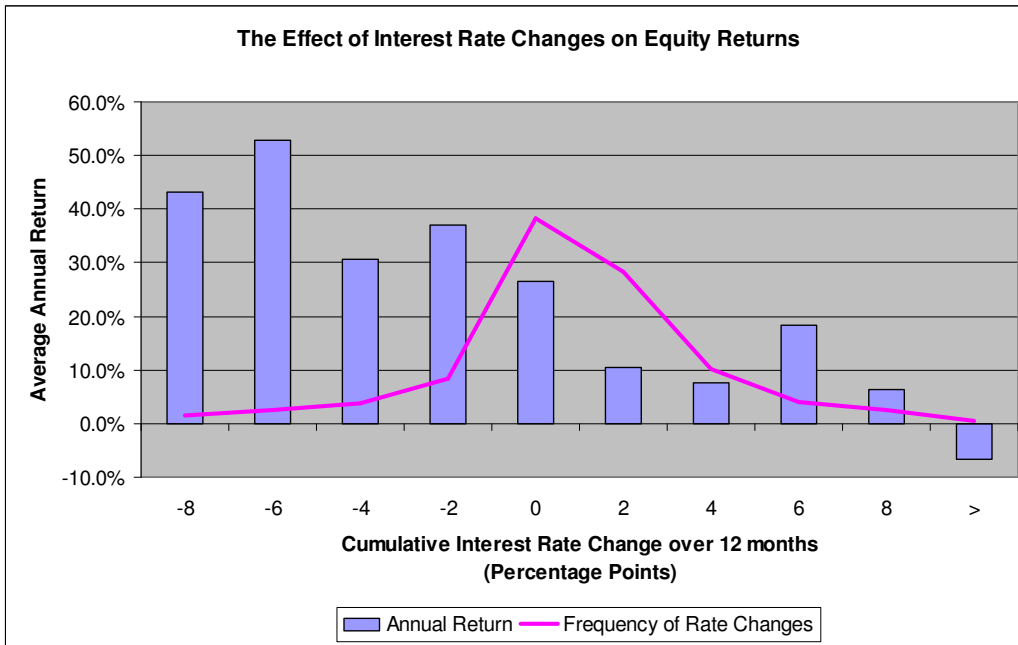


Chart 10: The frequency and level of interest rate changes and equity returns

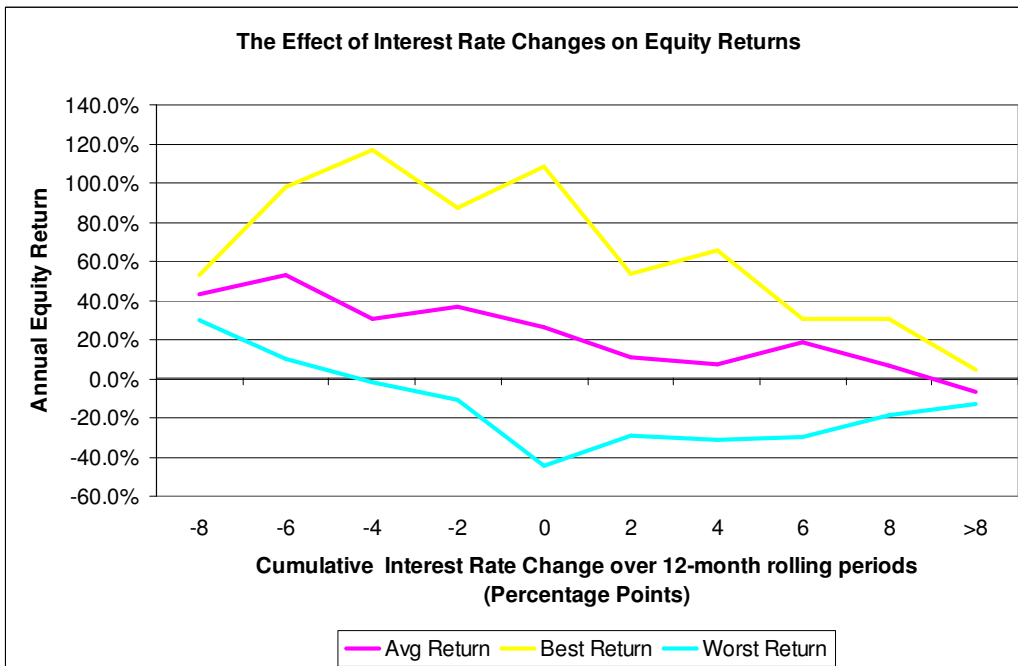


Chart 11: The worst and best equity returns during various interest rate changes

First, most of the time changes in interest rates appeared gradually over any 12-month period – about 75% of the time interest rates varied between -2% and 2% on a 12-month rolling basis. Second, it is evident that on average a downward cycle in interest rates is associated

with strong positive equity returns, while an upward interest rate cycle led to subdued to negative equity returns on average, especially when extreme rate adjustments were made.

Thus it appears that changes in interest rate movements did affect equity returns. Furthermore, the effect of interest rate changes on equity returns appears skewed, meaning that a downward interest rate move has had a more positive impact on equity returns than an upward rate move would have had a negative impact on returns.

Given that equity returns were affected by changes in interest rate trends, it is worthwhile to analyse specifically how the primary drivers of equity returns, namely earnings growth and changes in PE rating reacted to these changing trends.

### 5. Interest Rates and Earnings Growth

Chart 12 exhibits the earnings growth of the FTSE/JSE All Share Index over the past four decades, while chart 13 projects the cumulative interest rate change over 12-month rolling periods against earnings growth.

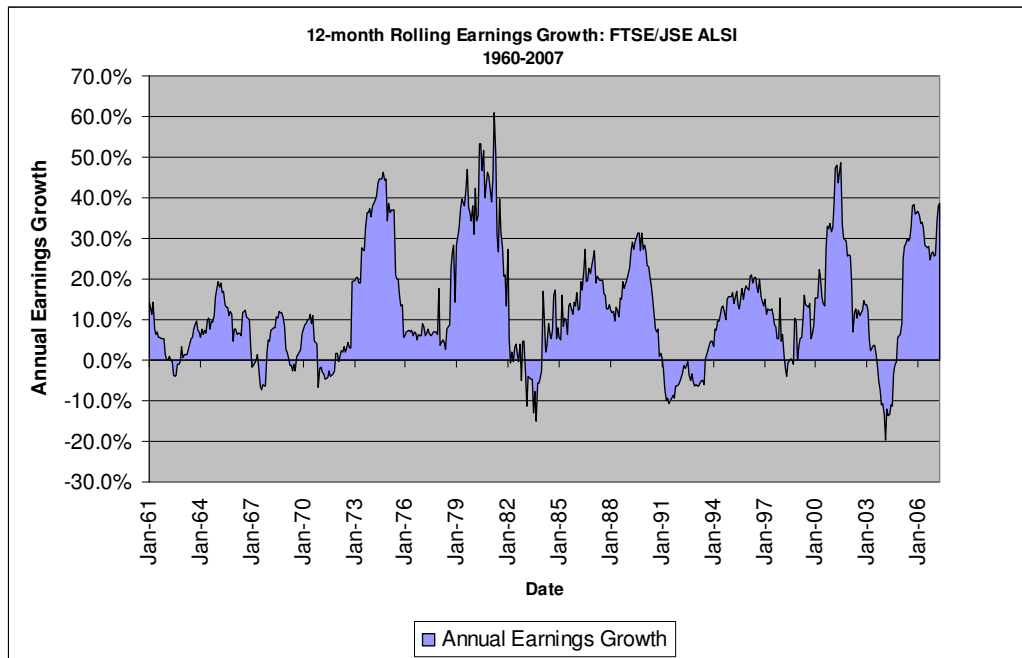


Chart 12: Nominal earnings growth of the FTSE/JSE All Share Index

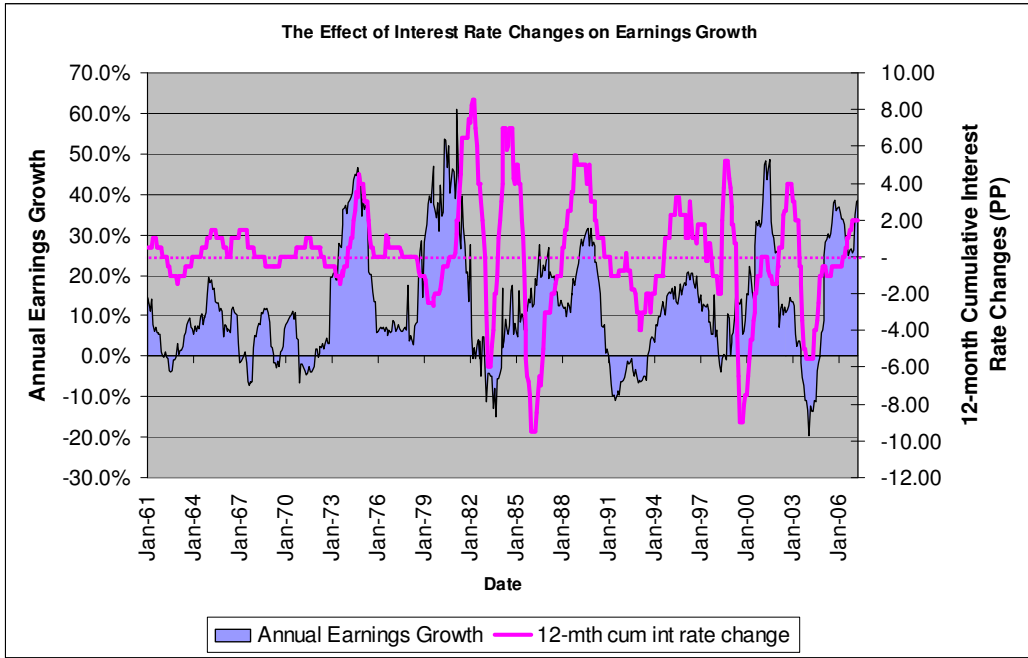


Chart 13: Changes in interest rates and nominal earnings growth

Little evidence exists that interest rate movements have had a direct and immediate impact on earnings growth (virtually no correlation). But then, interest rate changes take time to percolate through the economy. When rolling the earnings growth numbers forward by 12 months a different perspective, and much better inverse correlation (-0.30) is found (chart 14). Thus, some lag effect exists between interest rate changes and the corresponding earnings growth of companies listed on the stock market.

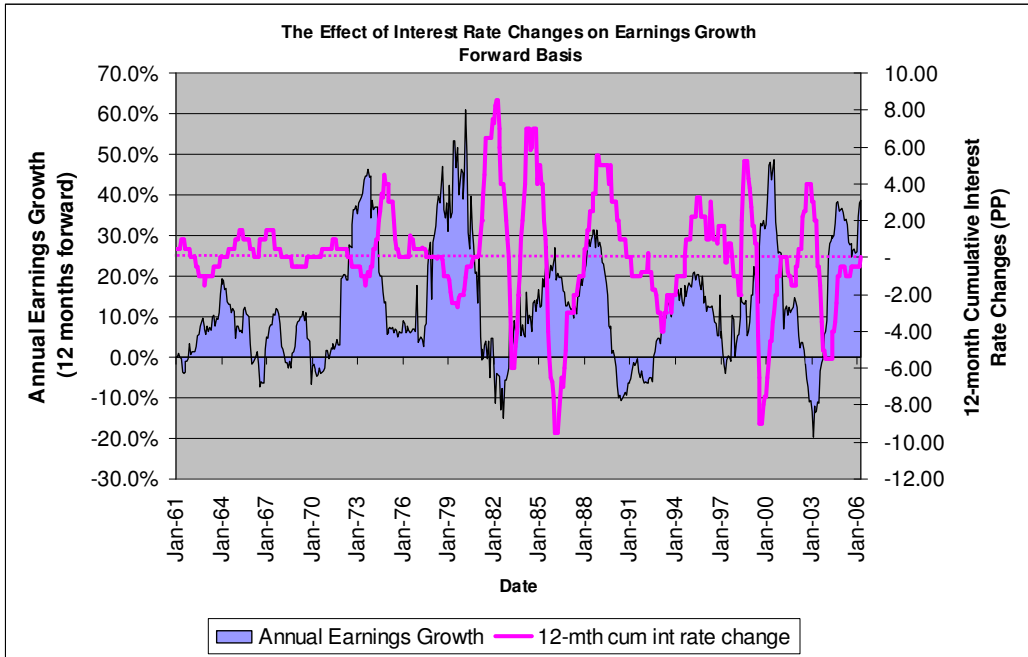


Chart 14: Changes in interest rates and nominal earnings growth (12 months forward)

## 6. Interest Rate Changes and PE Rating Changes

Chart 15 shows the monthly price earnings (PE) ratio of the ALSI, while chart 16 displays the relative change in the stock market's PE ratio over 12-month rolling periods together with the change in interest rates over the same period.

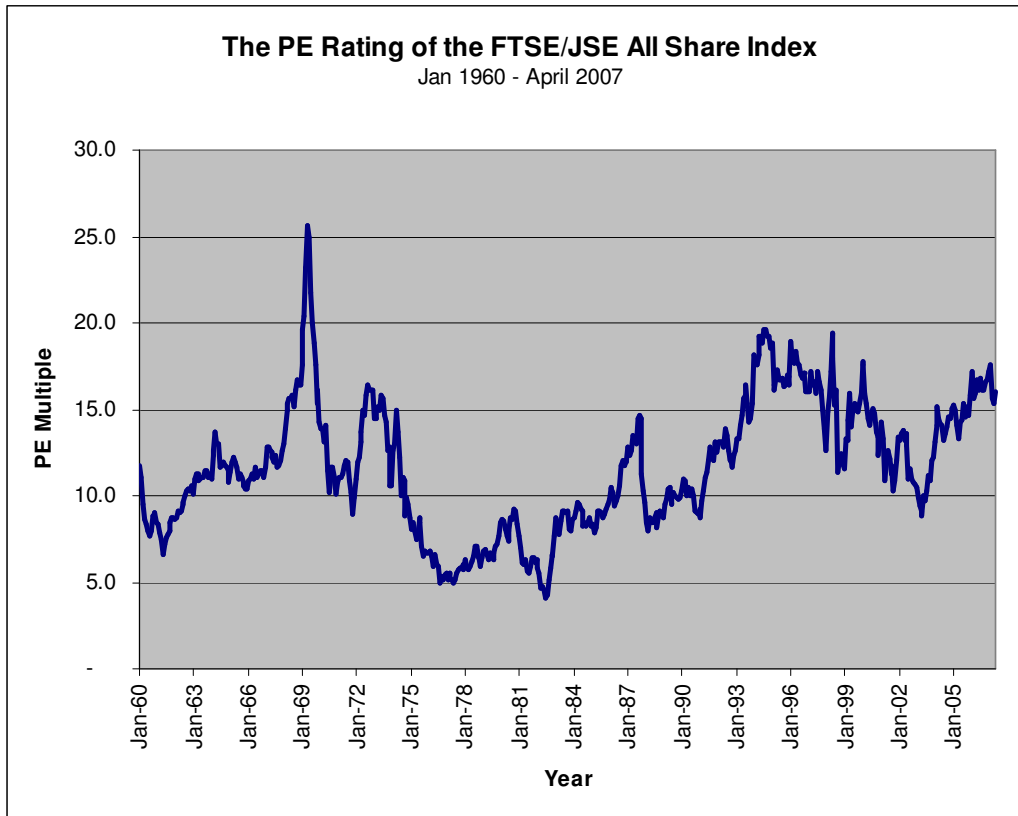


Chart 15: The price to earnings ratio of the FTSE/JSE All Share Index

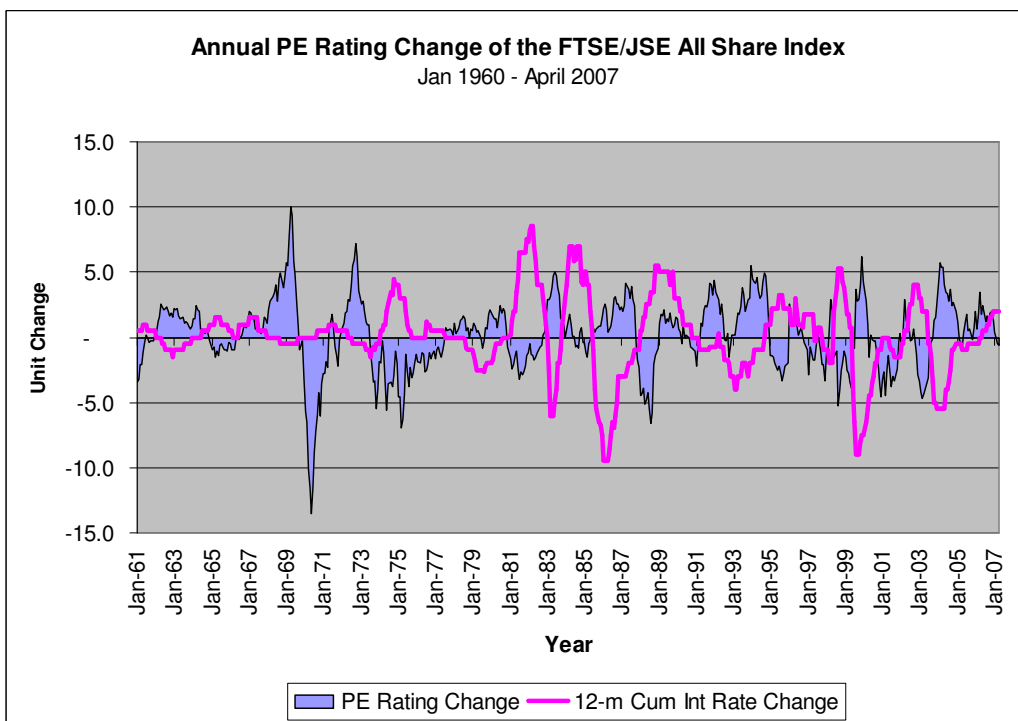


Chart 16: Changes in interest rates and price to earnings ratio change (1960-2007)

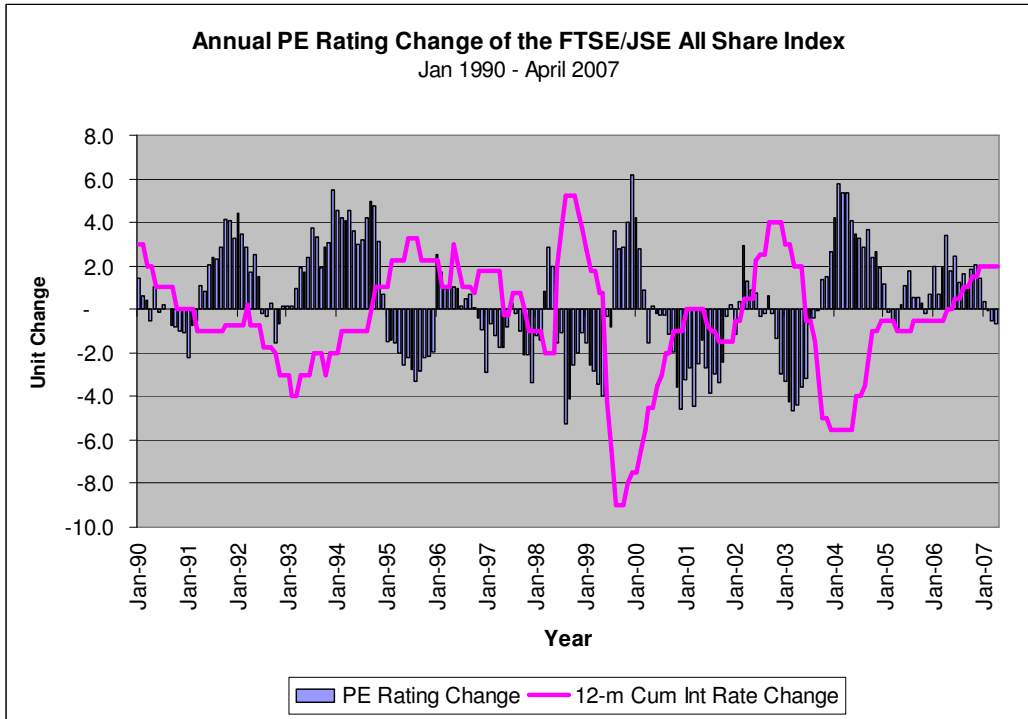


Chart 17: Changes in interest rates and price to earnings ratio change (1990-2007)

From charts 16 and 17 some significant inverse correlations (-0.37 and -0.50 respectively) are found between changes in the PE ratio and cumulative interest rate movements. From these observations it follows that while interest rate changes have had some lagged inverse effect on earnings growth, it had a more immediate inverse effect on PE ratings.



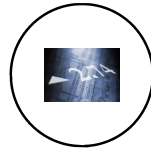
## 7. Synopsis

- The interest rate level – whether high or low – did not necessarily indicate whether equity returns would generally be lower or higher than in a previous period of different interest rate levels. For example, periods of relatively low interest rates did not imply significantly better equity returns than periods of relatively high interest rates.
- Significant interest rate changes from one period to another – the transitional period – did indicate an inverse correlation with equity returns.
- Rapid or extreme interest rate changes did have a significant inverse effect on equity returns.
- The effect of interest rate changes on equity returns is disproportionate or non-linear; generally periods of declining interest rates led to significant positive equity returns, while similar hikes in interest rates did not imply similar negative equity returns.
- Interest rate changes have had a lag effect on companies' earnings growth.
- Significant interest rate changes led to a re-(de-)rating of companies' future profitability (PE multiple); typically, a significant inverse correlation existed between interest rates and PE rating.
- Significant interest rate changes have had a profound effect on equity returns firstly through the re-(de-)rating of PE multiples and secondly, followed and supported by changes in companies' earnings growth.

For example, a significant interest rate increase, say more than 3% over a 12-month period, may result in a lower PE multiple (change in market rating), even though companies' earnings might still record some strong growth. Therefore, it is likely that equity returns will moderate in such cycles, but may turn negative as interest rates continue to rise and the growth in companies' earnings will start to reflect the tightening credit environment.

The Reserve Bank increased interest rates thus far by 250 basis points, which occurred gradually over the past 12 months. When compared with some previous cycles this period certainly represents a very moderate upward cycle. However, interest rates may still increase by 50 or 100 basis points from the current level by which time the cumulative effect of the rate hikes might become significant on economic growth, resulting in materially lower earnings growth forecasts.

Hence, if historical trends are anything to go by the splendid equity returns we have nearly become used to over the past four years should start to moderate over the next couple of years.



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