

### ARE SHARE MARKETS EXPENSIVE?

During the Global Financial Crisis of 2007/2009, the global share market<sup>1</sup> (calculated in international currencies) fell 54%. From the bottom of the market on 9 March 2009 to the end of April 2010 the same index climbed 70% when calculated in international currencies, but only 22% when calculated in New Zealand dollars. Irrespective of which currency is used to measure returns, the global share market has risen dramatically. Although it is still trading well below the levels reached in 2000 and 2007, this sharp rise has led investors to question whether the share market is expensive and, if so, what should they do?

In this paper we investigate whether or not share markets are indeed in expensive territory. Once this question has been answered, an investment strategy is discussed which should not only limit any downside in the current market, but also enable investors to continue to grow their capital – irrespective of the prevailing market environment.

### DATA USED

In the analysis that follows, the data used is sourced from Robert Shiller, Professor of Economics at Yale University. The data covers the period from January 1871 to April 2010<sup>2</sup>. This data is from the United States share market, which for these purposes is used as a proxy for global share markets as it is the largest economy (and share market) in the world, and therefore drives the performance of global share markets. The data is also adjusted for inflation so that it records the level of real return achieved, which is over and above inflation.

### PRICE/EARNINGS RATIOS AND DIVIDEND YIELDS<sup>3</sup>

To determine whether or not share markets are expensive, price/earnings ratios and dividend yields were used as valuation metrics.

First, monthly price/earnings ratios for the S&P500 Index were analysed (resulting in 1431 data points). For each price/earnings ratio, the associated two, five and 10-year forward real return was calculated. This information is summarised in the table that follows.

Quintile	P/E	Average P/E	Median 2-year forward real return (pa)	Median 5-year forward real return (pa)	Median 10-year forward real return (pa)
1	4.8 - 10.7	8.6	14.5%	12.5%	10.6%
2	10.7 - 13.7	12.1	10.2%	7.6%	7.8%
3	13.7 - 16.6	15.2	5.7%	6.8%	6.4%
4	16.6 - 19.4	17.9	4.7%	6.0%	5.5%
5	19.4 - 44.2	24.0	4.3%	2.0%	2.8%

Source: New Zealand Funds Management (based on Robert Shiller's data which uses rolling average 10-year reported earnings).

The table shows that investments that were made when price/earnings ratios were low (4.8 – 10.7) provided the highest returns over the next two, five and 10-year periods. By contrast, investments that were made when price/earnings ratios were high (19.4 – 44.2) provided the lowest returns during the two, five and 10 years that followed.

A similar analysis was conducted using the dividend yields of the S&P500 Index. This information is summarised in the table that follows.

Quintile	Dividend yield	Average dividend yield	Median 2-year forward real return (pa)	Median 5-year forward real return (pa)	Median 10-year forward real return (pa)
1	5.8% - 13.8%	7.0%	14.4%	12.9%	10.9%
2	5.0% - 5.8%	5.4%	7.5%	7.4%	7.7%
3	4.2% - 5.0%	4.6%	6.8%	6.0%	7.0%
4	3.4% - 4.2%	3.8%	3.4%	3.9%	5.6%
5	1.2% - 3.4%	2.8%	5.2%	5.0%	4.3%

Source: New Zealand Funds Management (based on Robert Shiller's data).

The table shows that investments that were made when dividend yields were high (5.8% – 13.8%) provided high returns during the two, five and 10 years that followed. By contrast, investments that were made when dividend yields were low (1.2% – 4.2%) provided low returns during the two, five and 10 years that followed.

(1) MSCI World Index.

(2) [http://www.econ.yale.edu/~shiller/data/ie\\_data.xls](http://www.econ.yale.edu/~shiller/data/ie_data.xls).

(3) Based on: Mauldin, J. (29 March 2010). Volume 6 – Issue 16, *Outside The Box*.

Shiller data published for April 2010 shows that the equivalent price/earnings ratio and dividend yield for the S&P500 Index is 22.0 and 1.9%, respectively. In both instances, these values fall within the 5th quintile in each table, which suggests that the share market is in expensive territory. This analysis also implies a decreased likelihood of investors experiencing high returns from this point forward.

## FAIR VALUE CHECK

While this analysis indicates that the market is currently valued in the higher echelons relative to historical data, another approach is to calculate the market's 'fair value'. In his latest quarterly newsletter<sup>4</sup>, the highly respected Jeremy Grantham, co-founder of GMO, comments that the S&P500 Index has "sprinted past" his firm's fair value estimate of 875. A quick calculation of fair value using a simple valuation model such as the Gordon Growth Model, and assuming a conservative equity risk premium of 5.5%, results in an estimate for the S&P500 Index of around 850. When compared to the 30 April 2010 value of 1187 it suggests that the market is nearly 40% overvalued. It goes without saying that there is no precise way to calculate the fair value for a market, and a small change in even one assumption or parameter can result in a significant change in the resulting valuation. However, it is safe to say that these calculations and observations do not refute the premise that the market is expensive at present.

## COULD SHARE MARKETS BECOME MORE EXPENSIVE?

It is worth noting that just because the share market may be viewed as expensive, it does not necessarily mean that share prices are about to start heading in a downward direction. While this may of course happen, it is also quite possible that share prices could continue to rise, causing the market to become even more expensive.

## PRICE/EARNINGS RATIO FOR THE S&P500 INDEX (based on rolling average 10-year earnings)



Source: Robert Shiller.

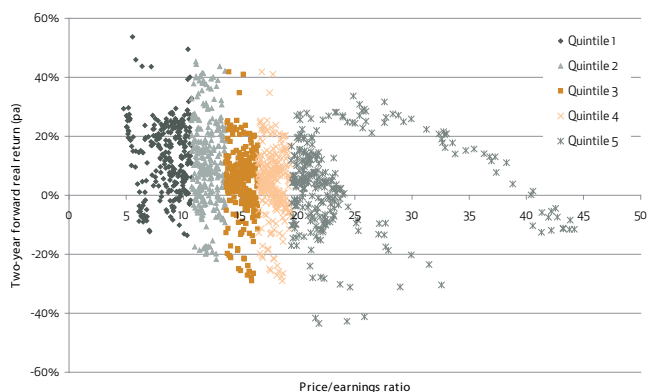
The graph above shows that in terms of price/earnings ratios, the share market is approximately at the same level as it was in 1995 – when ratios continued to increase for five years until they peaked at 44 towards the end of 1999, the highest level ever reached. While this is not expected to happen, it does illustrate that share markets can become significantly more expensive than their current levels, and they can remain expensive for extended periods of time.

## IMPLICATIONS FOR INVESTMENT RETURNS

The graphs that follow show the two-year and 10-year forward real returns based on the price/earnings analysis. The first graph illustrates that while the median two-year forward returns decrease as the market gets more expensive, the spread and volatility of this return series is quite high. The second graph highlights the fact that the premise that forward returns decrease as price/earnings ratios increase is far more pronounced when looked at over a 10-year period. When graphed the dividend yield analysis also indicates a much stronger trend over a 10-year period.

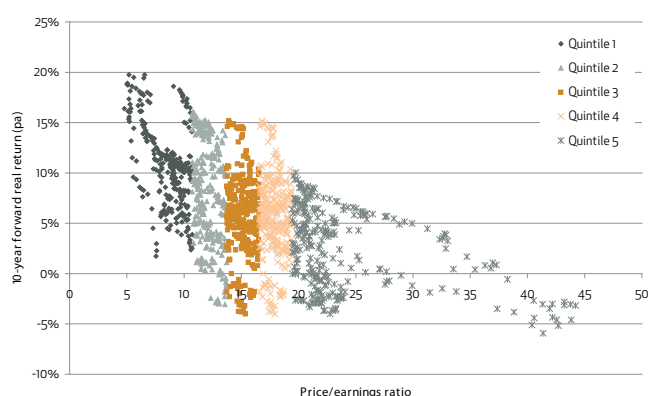
(4) Grantham, J. (April 2010). GMO Quarterly Letter, *Playing with Fire (A Possible Race to the Old Highs)*.

## TWO-YEAR FORWARD REAL RETURN (PA)



Source: New Zealand Funds Management (based on Robert Shiller's data).

## TEN-YEAR FORWARD REAL RETURN (PA)



Source: New Zealand Funds Management (based on Robert Shiller's data).

In summary, the historical data suggests that based on earnings and dividends the share market is currently expensive relative to historical averages. When the market is expensive, the data also indicates that forward-looking returns are likely to be somewhat muted, but this premise is more strongly supported by the analysis when a longer forward-looking period is used. Historical analysis also demonstrates that markets can become more expensive than they currently are and that they can remain expensive for an extended period.

## NEW ZEALAND FUNDS MANAGEMENT'S INVESTMENT PROCESS

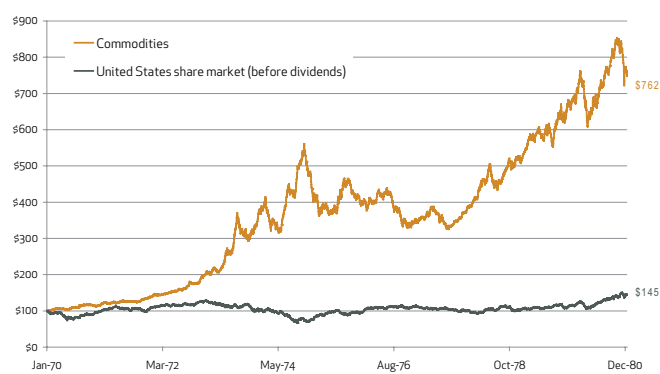
So where does all of this leave investors? Over the past two decades New Zealand Funds Management has developed an investment approach predicated on

three cornerstone principles: asset class diversification; active investment management; and the use of hedging strategies that allow investors to participate in share markets as they rise, while providing them with some protection when significant market corrections occur.

## DIVERSIFICATION BY ASSET CLASS

When investing for growth, investors have traditionally allocated a large portion of their capital to shares. This is because over very long periods of time, shares have outperformed all other asset classes<sup>5</sup>. However, as this paper demonstrates, it may be a mistake to rely solely on shares to generate strong returns when share markets become expensive. New Zealand Funds Management's Growth Portfolios have the ability to asset allocate towards other return-generating assets during periods of share market underperformance. The first graph that follows highlights the benefit of including commodities in a growth portfolio during periods of higher-than-average inflation, as occurred globally between 1970 and 1980.

## ASSET CLASS RETURNS: 1970 - 1980

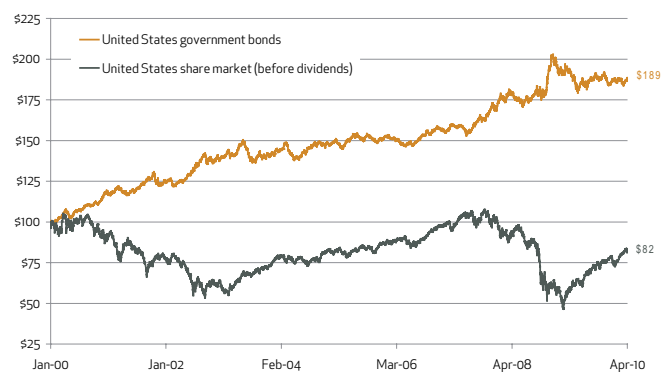


Source: Bloomberg.

The second graph highlights the benefit of including United States government bonds in growth portfolios during periods when interest rates are falling, as occurred between 2000 and 2010.

(5) Stocks for the Long Run (3rd Edition) by Jeremy J. Siegel, page 13.

## ASSET CLASS RETURNS: 2000 - 2010



Source: Bloomberg.

## ACTIVE INVESTMENT MANAGEMENT

New Zealand Funds Management has also found that using actively managed portfolios can assist in growing investors' capital faster than relying solely on the share market. This is especially the case during periods when the share market fails to deliver growth, as occurred during the period 2000 to 2010. An active investment manager endeavours to only invest in those shares that represent a better investment opportunity than the share market taken as a whole.

## SHARE HEDGING STRATEGY

Finally, New Zealand Funds Management has developed a share hedging strategy that allows investors to participate in share markets as they rise, while providing them with some protection when significant market corrections occur. In order to better understand this strategy, the concepts that underpin its development are summarised below.

## BACKGROUND INFORMATION

Share markets are forward looking and share prices reflect the consensus views of the market. Consensus views tend to slowly evolve as economic or financial indicators either confirm or refute the previous consensus view. It is predominantly for this reason that share markets tend to

trend, giving rise to so-called 'bull' or 'bear' markets. These trends cannot be seen in the day-to-day movements of share markets, but can be identified over longer periods of time.

## S&P500 INDEX



Source: Bloomberg.

One of the most reliable ways of identifying trends is through the use of moving average models. For example, one could compare the current level of the market to its average level over the past 10 months. If the market is currently above this average level it is said to be in an uptrend or bull market (in which case you would invest), while if the market is below its average level it is said to be in a downtrend or bear market (in which case you would divest). This type of analysis has been used by investors for more than eighty years<sup>6</sup>.

More sophisticated moving average models may use an exponential moving average rather than a simple moving average. The benefit of an exponential moving average is that it places more weight on recent data. It is also quite common to use a combination of a short-term and long-term moving average – for example, a 40-day and 200-day moving average. In doing so, the idea is to reduce the number of 'false signals' that the model generates, as the use of two moving averages has a smoothing effect.

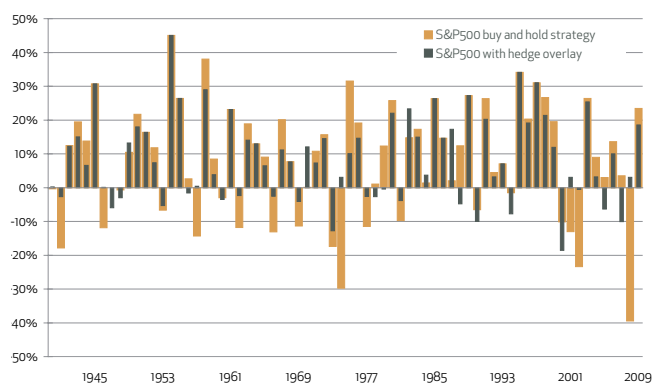
## DEVELOPMENT METHODOLOGY

New Zealand Funds Management's Growth Portfolios use a share hedging strategy with a similar methodology. The hedging strategy does not attempt to forecast

(6) Gartley, H. M. (1930). Profits in the Stock Market. Gordon, W. (1968). The Stock Market Indicators. Brock, W., Lakonishok, J. & LeBaron, B. (1992). Simple Technical Trading Rules and the Stochastic Properties of Stock Returns.

markets or assess whether the current consensus view is correct. Instead, it is accepted that markets trend and the Portfolios are positioned to take advantage of the identified trend. The decision whether to implement the share hedge is highly mechanistic and need not include subjective judgement. This removes the possibility of the manager being swayed by the current sentiment of the market.

In developing the share hedging strategy, daily total return data for the S&P500 Index from 1940 to 2008 was analysed. This analysis showed that the share hedging strategy was very successful when the market was clearly rising or falling, but gave false signals when the market was directionless. However, over time the cost of these false signals was more than offset by the benefits of protecting investors' capital when the market was falling, or participating in the market when it was rising. This is illustrated in the graph that follows, which shows that the share hedging strategy was particularly valuable during periods when share market returns were strongly negative.



Source: Bloomberg, New Zealand Funds Management.

To be certain that this relationship was not just unique to the United States share market from 1940 to 2008, the share hedging strategy was tested on the S&P500 Index from 1927 to 1940, and the German, British and Japanese share markets. In all cases the share hedging strategy was shown to be superior on a risk/return basis to a buy-and-hold strategy.

It is worth noting that around turning points a trend will be absent as the consensus view switches between growth and recession, or a bull and a bear market. Irrespective of the final decision, the share hedging strategy enables the Growth Portfolios to be correctly positioned when the next trend finally emerges.

## BENEFITS OF A SHARE HEDGING STRATEGY

Considerable research has been conducted into understanding what assists investors in achieving strong investment returns over time. A survey by United States based research organisation DALBAR identified that investors, when left to their own devices, frequently ended up with a lower return than the share market in which they were invested. This was because the volatility in returns caused them to sell their investments at the wrong time in an attempt to protect themselves from further losses.

## SHARE MARKET VERSUS INVESTOR RETURNS (1987 to 2006)



Source: DALBAR.

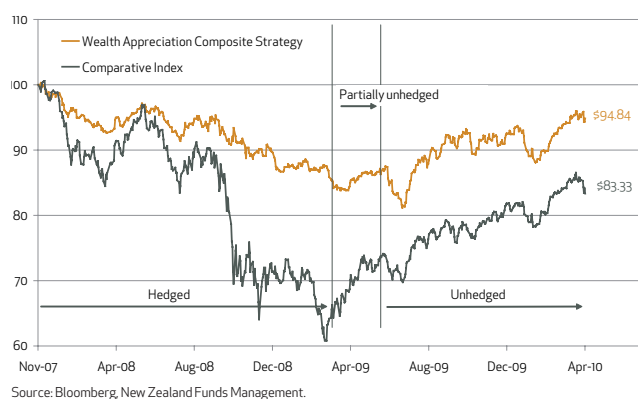
The share hedging strategy's benefit may be summarised by saying that in most cases the strategy resulted in a similar level of return to the share market, but with significantly less volatility. The attribute of lower volatility is especially important for individuals, families and trusts as it smoothes the investment journey and thereby increases the probability that they will stay invested and achieve their long-term return objective.

## PRACTICAL APPLICATION

Bringing this back to recent market movements, global share markets peaked in October 2007 and continued to sell off through 2008 until March 2009. Since March 2009, global share markets have rallied strongly, reflecting the consensus view that the market was oversold and the global economy is slowly recovering, or at the very least not getting any worse.

The implementation of the share hedging strategy within the Growth Portfolios began in October 2007 and resulted in a fully hedged position from December 2007. As a result, the share exposure within the Growth Portfolios was hedged throughout 2008 and clients' portfolios did not suffer as severe a drop as they might otherwise have done. As markets began to rally in March 2009, a shorter-term moving average model recognised this trend and the share hedge was partially removed on 19 March 2009. The longer-term moving average model was later triggered and the share hedge was fully removed in June 2009, as shown in the graph that follows.

## OUTCOME FROM HEDGING THE SHARE MARKET EXPOSURE



Since then there have been a couple of false signals as the share hedges have come on and off again. A number of false signals is, however, consistent with the back-testing carried out and may signal that the market is approaching another change in direction. The share hedging strategy continues to monitor market movements on a daily basis, looking for any changes in trends so that the Growth Portfolios can be positioned appropriately when these trends unfold.

## ONGOING ENHANCEMENTS

The share hedging strategy is constantly being reviewed and improvements made wherever possible. One area of improvement – discussed above – has been the addition of a shorter-term moving average model to capture share market rebounds. When the share market suffers a significant decline it has a tendency to rebound

sharply, making a 'V' shape when graphed. The following table shows a number of historical financial crises and subsequent rebounds.

Crisis	Date	MSCI (local currency) performance over the next two years
Arab oil embargo	Dec-73	3.1%
Iran revolution	Jan-79	36.6%
Black Monday 1987	Oct-87	40.9%
UK currency crisis	Sep-92	27.9%
Tequila crisis	Oct-94	32.5%
Asian crisis	Oct-97	46.1%
LTCM collapse	Aug-98	56.0%
Tech crash / 9/11 attacks	Sep-01	-5.0%
Worldcom default	Aug-02	20.7%
Credit crisis	Oct-08	70.0%*
RETURN TWO YEARS AFTER CRISIS		32.9%

Source: Bloomberg. \* From 9 March 2009 to 30 April 2010.

## CONCLUSION

In the first half of the article evidence was presented that share markets are currently expensive. When share markets are expensive, the data also indicates that forward-looking returns are likely to be somewhat muted. Evidence was also presented to show that markets could continue to rise and/or remain expensive for sometime. New Zealand Funds Management's investment approach was then discussed which is predicated on three cornerstone principles: asset class diversification; active management; and the use of hedging strategies. The rationale for using a hedging strategy and the methodology used to develop it were examined in some detail. While at times the market environment may make it difficult for clients to achieve their investment objectives, a distinction can be drawn between avoidable disasters and unavoidable ones. A good investment process will take care of the former and go a long way to protecting clients against the latter.

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