THE IMPACT OF CAPITAL CHANGES
on share price performance

DAVID BEGGS, Portfolio Manager, Metisq Capital

This paper examines the impact of capital management decisions on the future share price performance of ASX-listed companies. The results indicate that changes in capital have a significant impact on future share price returns. On average, companies underperform the market following increases in capital, and outperform the market following reductions in capital. These results are consistent across the range of capital changes and robust after controlling for company value metrics.

The impact of capital management initiatives on company share price movements is a frequently discussed issue in the financial literature and it is a potentially useful signal in the world of professional investing. Companies periodically engage in a wide range of capital management activities, and investor reactions to these events have the potential to dictate share price movements and sentiment over subsequent months.

In the United States, it has been found that when a listed company issues additional equity, its share price will tend to *underperform* the market over the following 12 months. Conversely, when a company repurchases or reduces equity, it has been found that its share price will tend to outperform the market over the following 12 months (Brav et al. 2000; Ikenberry et al. 1995; Loughran and Ritter 1997; Nelson 1999). Similar studies point to evidence of sustained share price underperformance following company mergers and acquisitions (Agarwal et al. 1992; Asquith 1983), and underperformance following exchange listings and initial public offerings (Dharan and Ikenberry 1995; Loughran and Ritter 1995).

The most widely accepted explanation for these results is centred on the belief that companies implement efficient and timely capital structuring decisions (Ikenberry et al. 1995). It is argued that management will issue new capital when it is beneficial to do so, that is when they believe the company shares are expensive or overvalued, and also repurchase capital when it is beneficial to do so, that is when they believe the company shares are cheap or undervalued (Bali et al. 2006). In this context, evaluating share price movements in the period after capital management initiatives aligns closely with idea of 'value' investing. Management will buy shares in the undervalued company because they believe it is more likely to outperform the market, and sell more shares in the overvalued company because they believe it is more likely to underperform the market.

This paper examines the impact of capital management decisions on the future share price performance of ASX-listed companies. Specifically, it considers a wide range of historical capital management decisions and examines whether these events can be tied to a company's future share price movements. In addition to considering the direction of the capital change, the paper examines whether the size of the capital changes can be used to help predict future share performance.

Methodology

Typically, financial research analyses the impact of changes in capital using instances of equity issuances (increasing outstanding equity), buy-backs (decreasing outstanding equity), IPOs (initial public offerings) and other explicitly announced events. In these cases, company documentation is sourced to confirm announcement and completion dates for changes in equity. This approach has the benefit of identifying the exact date information becomes available to the market, allowing timely evaluation of share price movements. However, the most obvious drawbacks to this approach are that it restricts the analysis to explicitly announced capital management initiatives, and the availability and accuracy of these records gradually diminish with longer historical time periods.

A broader and more general measure to account for changes in a company's equity capital over a given time period is proposed here. Net capital change, denoted as NCC, is simply the percentage

change in the company's market capitalisation that is not due to changes in the split adjusted share price.

For each stock define the variables as:

m = months in historical formation period over which the net capital change is to be measured

MC_t = Market Capitalisation at time t

MC_{t-m} = Market Capitalisation at time $t - m$

P_t = split adjusted share price at time t

P_{t-m} = split adjusted share price at time $t - m$

Then define net capital change (*NCC*) as:

$$NCC = \frac{1}{MC_{t-m}}\left(MC_t - MC_{t-m}\left(\frac{P_t}{P_{t-m}}\right)\right)$$

As an example, consider company XYZ with a market capitalisation of $115 and and split adjusted share price of $11. Six months ago, the company had a market capitalisation of $100 and a split adjusted share price of $10. Therefore, over that period the net capital change can be calculated as:

$$NCC = \frac{1}{100}\left(115 - 100\left(\frac{11}{10}\right)\right) = 5\%$$

Over the historical six-month period, company XYZ increased its market capitalisation by 15 per cent, where 10 per cent was due to price appreciation and 5 per cent was due to capital raising.

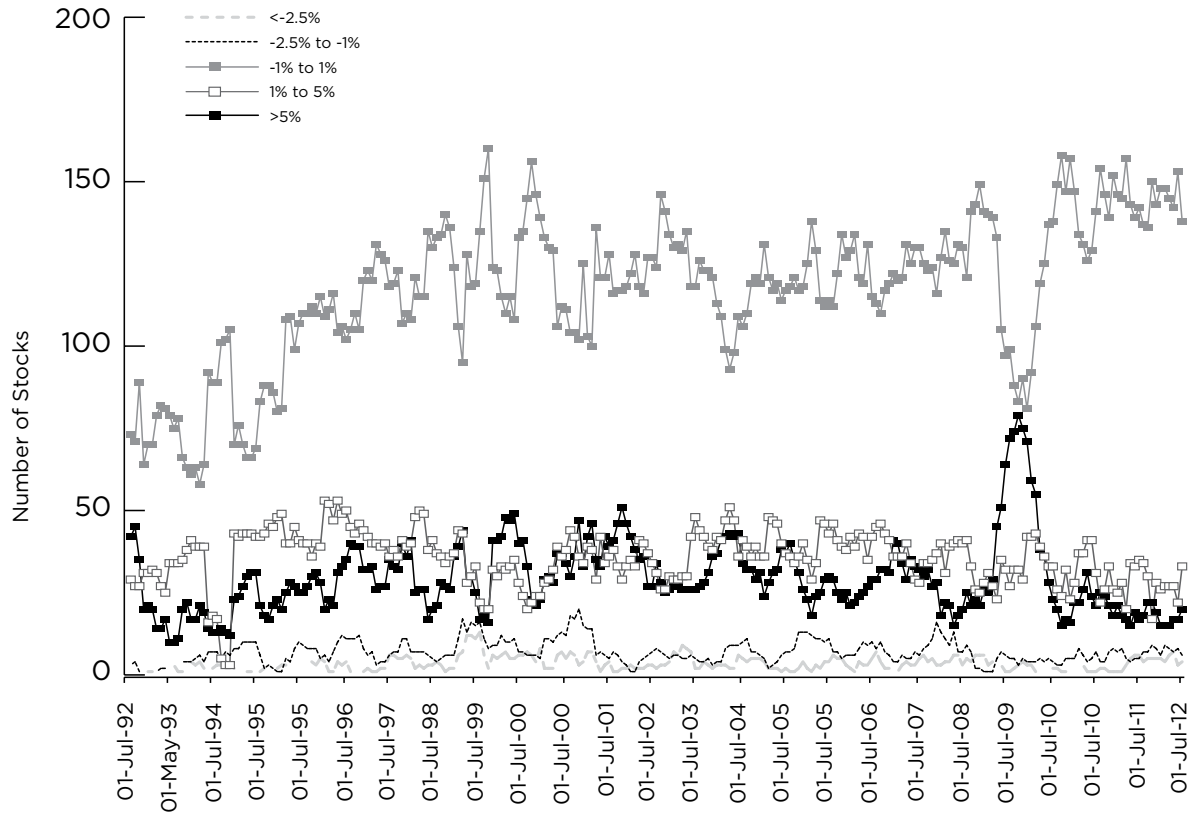
It is clear from this example that the formulation of *NCC* is very broad and is able to capture a wide range of capital management activities without having to examine historical company announcements in detail. The most common capital management activities include (but are not limited to) share buy-backs, share issuances, special dividends, ordinary dividends, mergers, takeovers, maturation of convertible bonds/debentures, conversion of preference shares to ordinary shares, stapled securities, hybrid capital raising and issuance through dividend reinvestment plans.

Data

The data set used here is the universe of stocks in the S&P/ASX 200, with daily data over the time period July 1992 to December 2012. The custom formulation of *NCC* is calculated monthly for all stocks in the data set, subject to the choice of historical formation period, *m*. In this paper, the value of *m* is restricted to six months. This value is chosen because it is long enough to capture most capital management activities from start to finish, but short enough to avoid bringing in excessive stock-specific and market-wide noise.

Figure 1 shows the distribution of the number of companies having rolling six-month capital changes over the two decades from July 1992 to December 2012 for the S&P/ASX 200. The figure identifies the number of companies within each range of sizes of net capital changes.

FIGURE 1: Number of stocks making capital changes: S&P/ASX 200



The data shows that for well over half the stocks, roughly 60 per cent, there is typically no capital change (-1 per cent to 1 per cent) during the rolling six-month periods. The average number of companies raising capital over a rolling six-month period (change > 5 per cent) is 25, while the average number of companies decreasing capital (<-2.5 per cent) is 7. Not surprisingly, the number of companies increasing capital far outweighs the number reducing capital. Companies increase capital for many reasons, however, large-scale reductions in capital are rarely seen, and when reductions do occur, they are commonly executed through on-market or off-market buy-backs which can occur over the course of many months.

Figure 1 shows that the trends in capital changes are largely consistent with the market cycles, except for the notable spike in capital increases and drop in capital reductions throughout 2009. This pattern shows a direct reaction to the global financial crisis, during which many companies were forced to increase their capital in order to reduce debt, satisfy regulatory requirements and fund ongoing operations.

Investigation and results

The principal question being investigated in this paper is whether the size and direction of changes to a company's capital will impact that company's share price performance over the subsequent months.

The simplest and most obvious way to explore this question is to simulate a series of portfolios from the S&P/ASX 200 index over an historical period where stocks are selected according to their recent net capital change, and then evaluate the performance of these portfolios relative to the market benchmark.[1] Four separate approaches are investigated and reported below.

Ranking by net capital change

In the first instance, stocks are ranked each month according to the *NCC* variable. Each month, the top 20 per cent of stocks with the largest (most positive) capital changes are selected and denoted as portfolio (*P5*). Stocks ranked 60 per cent to 80 per cent according to most positive capital change are selected for portfolio *(P4*), and so on until the bottom 20 per cent of stocks is selected into the smallest (or most negative) capital change portfolio (*P1*).

Selecting portfolios by ranking of *NCC* means that it is not the absolute size of the net capital change which is the cut–off value; rather it is the size of *NCC* relative to all the other stocks that determines selection. This approach has the benefit of being consistent with much of the existing literature on value and momentum investment styles that focuses on relative value and relative momentum strength. Furthermore, using relative rank ensures that selection is not overly biased by data errors and extreme outliers.

For measuring performance, an equal weighting is applied to the stocks within each of these portfolios. Equal weighting is chosen ahead of market capitalisation weighting to avoid problems caused by the largest stocks in the index. For example, when BHP is selected in a quintile portfolio, it typically takes 30 per cent to 40 per cent or more of the capitalisation weight, which is not particularly useful from an investment point of view or for identifying market inefficiencies. Equal weighting, in this case, gives a much more interpretable distribution of stocks weights.

To evaluate performance, the portfolios formed each month are held for 12 months, meaning the total portfolio will be a combination of 12 staggered sub-portfolios, each held for 12 months. The 12-month holding period for each sub-portfolio begins the day after the end of the formation period, ensuring the return period for each sub-portfolio is independent of the formation period, thus eliminating any hindsight bias.

The five portfolios *P1, P2, P3, P4* and *P5* are simulated over the S&P/ASX 200 for the sample period 1992 to 2012. The average annual performance for each of these portfolios relative to the S&P/ASX 200 (termed here as alpha) is shown in Figure 2 and Table 1. Transaction costs are ignored in these simulations, both for simplicity and for consistency with existing literature. Given that there is no standard assumption for applying transaction costs, it remains most useful to examine all further results in a costless environment.

The portfolio of stocks with lowest *NCC* rank, *P1*, i.e. those companies returning capital to shareholders, outperforms the benchmark index by 4.5 per cent per annum. Conversely, the portfolio of stocks with the highest *NCC* rank, *P5*, i.e. those companies raising capital from shareholders, underperforms the S&P/ASX 200 by an average of 2.5 per cent per annum.

This result is consistent with the value theory of capital management, namely that companies will increase their capital when it is cheap to do so (company is undervalued and will outperform) and decrease their capital when it is beneficial to do so (company is overvalued and will underperform).

Importantly here, the consistency of the returns is found not just in the tails of the data, rather the average annual alphas decrease in a monotonic manner as we move from *P1* to *P5*. This is a

FIGURE 2: Twelve-month alpha following different capital management strategies

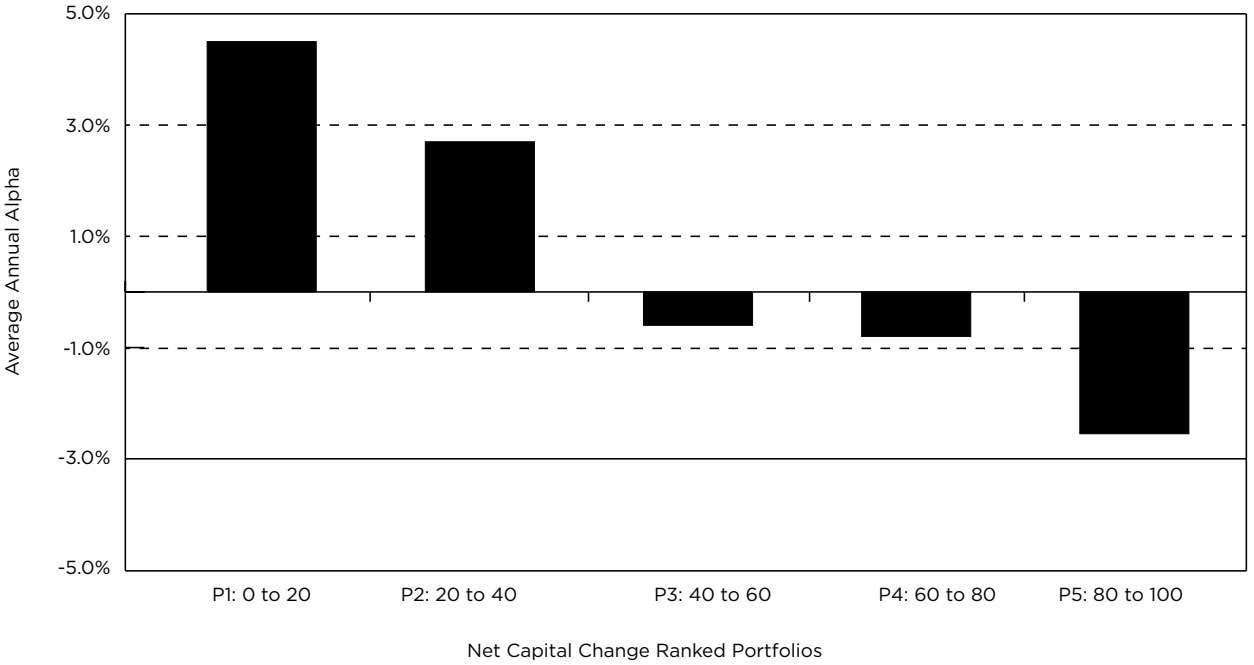


TABLE 1: Twelve-month alpha following different capital management strategies

NCC Rank Portfolio		12-month Hold Alpha
P1: 0 to 20	Capital Reduction	4.5%
P2: 20 to 40		2.7%
P3: 40 to 60		-0.6%
P4: 60 to 80		-0.8%
P5: 80 to 100	Capital Raising	-2.5%

strong result, and suggests that the ranking of a company's change in capital relative to the other stocks in the universe contains meaningful information that can be used to help predict the company's future share price movements.

Ranking by net capital change combined with value-style investing

Despite the strength of the results above, there is an underlying question as to whether the net capital change is merely a proxy signal for value, and hence whether the NCC ranking will generate similar results once the sample is controlled for company value scores. To answer this question, a set of simulations are run controlling for value, taking into account the impact of both 'cheap' and 'expensive' stocks.

A value score is calculated for each stock in the S&P/ASX 200, which is the rank of each company's price–book ratio (PB) within the benchmark index. PB is chosen to be consistent with existing studies and because its meaning is easily understood. The company with the smallest PB ratio is given the lowest rank, and the company with the largest PB ratio is given the highest rank. Cheap stocks are then classified as any stock with a PB rank below the 50th percentile, and expensive stocks are those with a PB rank above the 50th percentile.

Stocks are then re-ranked according to *NCC* within each of the cheap and expensive subsets. Portfolios *P1* and *P5*, are then created from both the cheap and expensive subsets, and these four portfolios are simulated in the way described earlier. Again, the simulation period is July 1992 to December 2012 with a 12-month holding period for stocks bought at each monthly rebalance. The annual performance for each portfolio relative to the S&P/ASX 200 (alpha) is shown in Figure 3 and Table 2.

The portfolio of cheap stocks that returned the most capital to shareholders outperforms the S&P/ASX 200 by 6 per cent per annum. The portfolio of cheap stocks that raised the most capital from shareholders underperforms by -0.6 per cent per annum.

The portfolio of expensive stocks that returned the most capital to shareholders outperforms the S&P/ASX 200 by 2.8 per cent per annum. The portfolio of expensive stocks that raised the most new capital from shareholders underperforms by -4.2 per cent per annum.

In both subsets, cheap stocks and expensive stocks, the portfolio of stocks returning capital to shareholders outperforms the portfolio of stocks raising new capital from shareholders. In fact, the return differential between the two portfolios is almost identical for both the cheap and expensive subsets: {6% - (-0.6%) = 6.6%}, and {2.8% - (-4.2%) = 7.0%}. These results indicate that the impact of the net capital change is largely independent of any standard valuation metrics, and it is not simply a reformulation of value investing.

The analysis above provides strong evidence that changes in equity capital can have a significant impact on future share price movements. However, thus far the rank of the net capital change has served as the criterion for selecting comparative portfolios. The question must also be asked whether the magnitude of the net capital change also contains useful information.

Magnitude of net capital change

To answer this question, a series of portfolios are simulated across the S&P/ASX 200 using the magnitude of the net capital change as the selection criteria rather than the ranking. The number of stocks in the portfolios can now vary each month depending on the market conditions, but the interpretation of results is perhaps more clearly understood in terms of familiar physical quantities.

As observed earlier, the number of companies increasing capital far outweighs the number reducing capital. Companies increase capital for many reasons, however, large-scale reductions in capital are rarely seen. In view of this observation, four cases are considered.

- All capital reductions of more than 2.5%, (i.e. *NCC* < -2.5%)
- All capital reductions of more than 1.0%, (i.e. *NCC* < -1.0%)
- All capital raisings of more than 7.5%, (i.e. *NCC* > 7.5%)
- All capital raisings of more than 10.0%, (i.e. *NCC* > 10.0%).

Portfolio simulations are then carried out as previously described. Results are shown in Figure 4 and Table 3.

These simulations reinforce the results from the earlier section. Those stocks that decrease capital by more than 1 per cent and 2.5 per cent outperform the S&P/ASX 200 by 5.9 per cent and 6.2 per cent per annum, respectively. Conversely,

FIGURE 3: Comparative alpha for cheap and expensive stocks for different capital management strategies

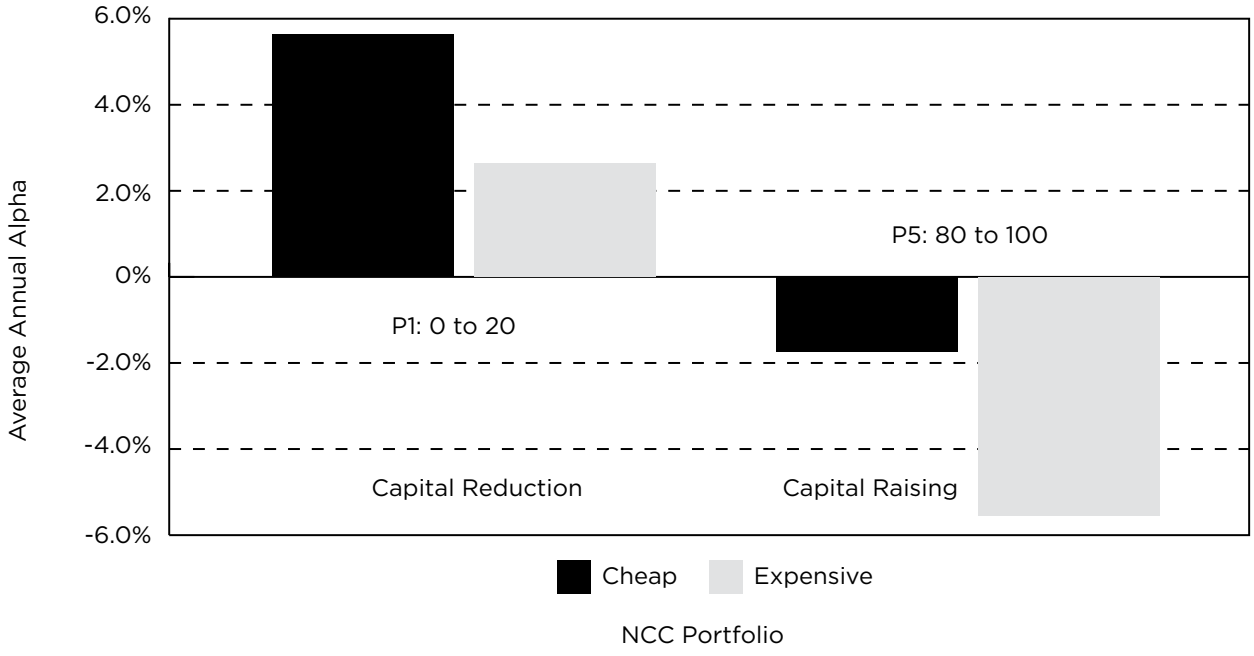


TABLE 2: Comparative alpha for cheap and expensive stocks for different capital

NCC Portfolio	Relative Net Capital	Cheap Good Value	Expensive Poor Value
P1: 0 to 20	Capital Reduction	6.0%	2.8%
P5: 80 to 100	Capital Raising	-0.6%	-4.2%

stocks that increase capital more than 5 per cent and 10 per cent underperform the S&P/ASX 200 by 3.7 per cent and 4.1 per cent per annum, respectively. Although the number of stocks selected varies, these results are robust in that only those stocks that satisfy the criteria for substantial net capital changes are selected each month.

Magnitude of net capital change along with value-style investing

For completeness, these results are controlled for the impact of value metrics. Using the procedure employed earlier, the portfolio of stocks with capital increases above 10 per cent and the portfolio of stocks with capital decreases more than 2.5 per cent are simulated from a subset of cheap stocks and a subset of expensive stocks using the fiftieth percentile cut-off on the ranked price–book ratio. The annual alpha for each portfolio relative to the S&P/ASX 200 is shown in Figure 5 and Table 4.

The portfolio of cheap stocks that reduces capital outperforms the S&P/ASX 200 by an average of 6.2 per cent per annum over the period. The portfolio of cheap stocks that raises new capital underperforms the S&P/ASX 200 by an average of -1.9 per cent per annum.

Similarly, the portfolio of expensive stocks that reduces capital outperforms the S&P/ASX 200 by an average of 2.9 per cent per annum, and the portfolio of expensive stocks that raises new capital underperforms the S&P/ASX 200 by an average of -6.1 per cent per annum.

Again, the return difference between the capital increase portfolio and capital decrease portfolio is very similar, in the magnitude of 8 to 9 per cent per annum for both cheap stocks and expensive stocks. This result is fully consistent with the rank simulations reported above.

Further investigation

While these results are robust and largely comprehensive, they do provide the setting for a deeper investigation into the interaction between net capital changes and other documented

FIGURE 4: Twelve-month alpha following different capital management strategies

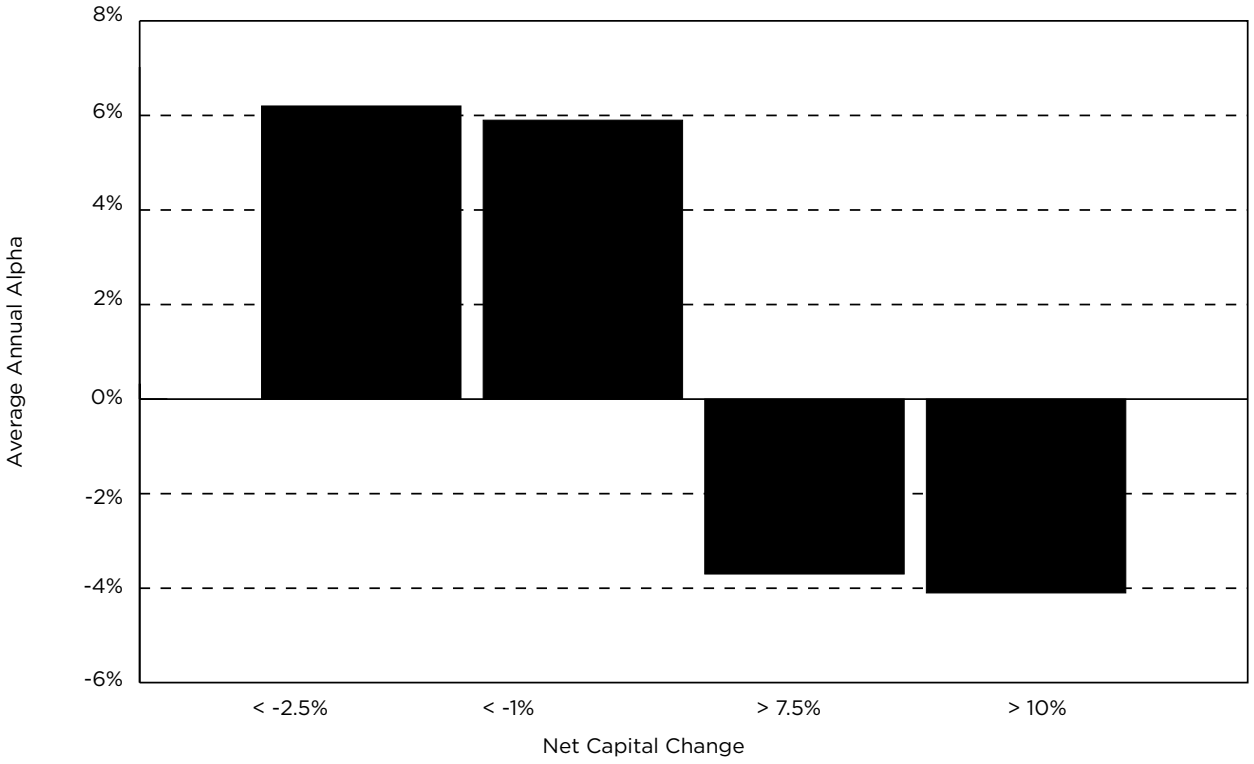


TABLE 3: Twelve-month alpha following different capital management strategies

Selection Criteria	Net Capital Change	Alpha
Less than -2.5%	Capital Reduction	6.2%
Less than -1%	Capital Reduction	5.9%
Greater than 5%	Capital Raising	-3.7%
Greater than 10%	Capital Raising	-4.1%

FIGURE 5: Comparative alpha for cheap and expensive stocks for different capital management strategies

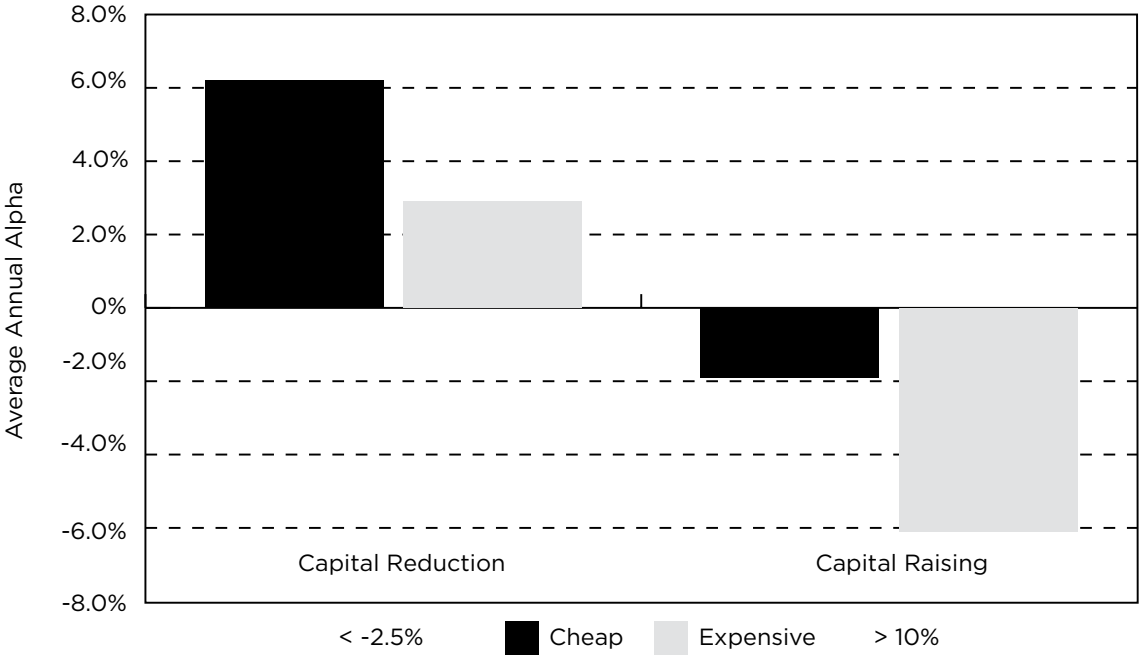


TABLE 4: Comparative alpha for cheap and expensive stocks for different capital

Selection Criteria	Net Capital Change	Cheap	Expensive
<-2.5%	Capital Reduction	6.2%	2.9%
>10%	Capital Raising	-1.9%	-6.1%

market anomalies. For example, controlling results independently for both momentum signals and systematic risk (beta) may provide additional insights into the potential justifications for capital management decisions and help explain the impact these decisions have on future share price movements.

Conclusion

This investigation provides evidence for Australia that corporate decisions about capital management affect shareholder returns. Both the rank of capital changes relative to other stocks in the benchmark and the absolute size of the capital changes have been shown to be strong signals for determining future share price movements. Furthermore, the signal provided by net capital change is independent of value metrics, thus providing useful information over and above that generated using conventional measures of value. ■

Note

1. In order to reduce the impact of size bias, all analysis was replicated over the S&P/ASX 100 index. The S&P/ASX 100 results were largely consistent with the S&P/ASX 200 results, thus suggesting company size was not the primary driver of returns. Further investigation into interaction of size and net capital change is left for future research.

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