

# PERFORMANCE OF EQUITY MUTUAL FUNDS IN NEW ZEALAND

## Dr. Narinder Singh Malik\*

Associate Professor, Haryana School of Business,  
Guru Jambheshwar University of Science & Technology,  
Hisar-125001 (Haryana) INDIA  
E-mail: nsmalik2002@yahoo.com

## Tim Coker\*\*

Department of Accountancy & Finance,  
University of Otago, Dunedin, NEW ZEALAND

## Sam Kater\*\*

Department of Accountancy & Finance,  
University of Otago, Dunedin, NEW ZEALAND

## ABSTRACT

After critically reviewing an empirical study on New Zealand mutual funds by Bauer *et al.* (2006), we used the same performance measurement techniques to evaluate New Zealand domestic equity mutual fund performance over the 2006 to 2010 period.

During this period of time we expect fund returns to be negative but by a lesser magnitude than that of a comparable index, to justify the fees charged by managers. We expect outperformance to be a result of market timing abilities of managers as they shift to more defensive stocks during the GFC. Contrary to expectations, on aggregate we find no evidence of significant alpha for domestic equity mutual funds or timing ability by their managers. However, when examining funds individually we find one fund with significant positive alpha. Additionally, fund return appears to be influenced largely by market movements and not by investment strategy during the economic bubble and subsequent downturn over the entire sample period. Breaking the sample period down into pre-recessionary period and the period that follows, we find significant evidence of momentum investing pre-recession. Conversely, we find significant evidence of small stock investing thereafter.

**Key Words:** *Global Financial Crisis, Equity Mutual Funds, Alpha, CAPM, Momentum Investing.*

## INTRODUCTION

The introduction of the Unit Trust Act of 1960 was the starting point of mutual fund investing in New Zealand. In recent years there has been rapid growth of investment in mutual funds. There were approximately 16 registered funds at the end of 1986, over a hundred in 1999 and now approximately 450 actively marketed funds exist<sup>1</sup>. As at December 2010 total funds under management was over \$65 billion<sup>2</sup>.

After critically reviewing an empirical study on New Zealand mutual funds by Bauer *et al.* (2006), we used the same performance measurement techniques to evaluate New Zealand domestic equity mutual fund performance over the 2006 to 2010 period. This period is of particular interest as the Global Financial Crisis (“GFC”) occurred during this time. During this period of time we expect fund returns to be negative but

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\*Corresponding Author: Dr. Narinder Singh Malik, Associate Professor, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar-125001, India. E-mail: nsmalik2002@yahoo.com  
Ph. (+91) 1662-263370; (+91) 9354321068 (Mobile)

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<sup>1</sup> Source: Fundsources

<sup>2</sup> This figure includes both New Zealand and overseas investments and is inclusive of life insurance and superannuation schemes. Figure in New Zealand dollars.

by a lesser magnitude than that of a comparable index, to justify the fees charged by managers. We expect outperformance to be a result of market timing abilities of managers as they shift to more defensive stocks during the GFC. Contrary to expectations, on aggregate we find no evidence of significant alpha for domestic equity mutual funds or timing ability by their managers. The study is organised as follows: section II describes the data, section III presents the empirical tests and findings and section IV concludes.

**II. DATA**

*A. Mutual fund data*

We would like to thank Morningstar New Zealand for providing us with returns of domestic equity mutual funds. All returns are inclusive of any distributions, net of annual management fees and in New Zealand dollars. Our sample is restricted to funds with at least five years of data which leads us to a sample of 11 domestic equity mutual funds with returns from January 2005 to December 2010.

Bauer *et al.* (2006) in their study of the performance of New Zealand’s mutual fund market accounted for survivorship bias by including dead funds in their sample until they disappeared. The rationale behind this is, as Brown *et al.* (1992) explained, “leaving out dead funds leads to an overestimation of average performance.” In this study of New Zealand mutual fund performance we have not accounted for survivorship bias thus average returns may be overstated.

*B. Benchmark data*

As we are examining domestic equity mutual funds the stocks in the NZX 50 are used to construct our benchmark. All benchmark data was found from Bloomberg. The NZX 50 is New Zealand’s headline market index and represents over 70 per cent of all publically traded firms by market capitalisation<sup>3</sup>. We therefore believe this is a suitable benchmark for domestic equity mutual funds to be compared with.<sup>4</sup>

For all performance measurement models that follow, excess market return is calculated as the monthly return of the NZX 50 less the New Zealand 90 day bank bill rate<sup>5</sup>. The Carhart (1997) four-factor requires portfolios to be created for the small minus big factor (“SMB”), the high minus low factor (“HML”), and the momentum factor (“Mom”)<sup>6</sup>. SMB factor is calculated by ranking all benchmark stocks by market capitalisation. The SMB is the return difference between the bottom 20 per cent portfolio and the top 80 per cent portfolio by market capitalisation. For the HML factor stocks are ranked based on their book-to-market ratio. Bauer *et al.* (2006) place stocks with the top 30 per cent book-to-market ratio into the high portfolio and stocks with the lowest 30 per cent ratio in the low portfolio<sup>7</sup>. The difference in return between the high and the low portfolios is the HML factor. The above factors’ portfolios are market capitalisation weighted and are rebalanced annually. Lastly, the momentum factor is formed by ranking stocks based on their previous one year return. The return difference between the top 30 per cent and bottom

30 per cent gives the momentum factor returns. Portfolios are market capitalisation weighted and are rebalanced monthly to get a rolling momentum factor.

**III. EMPIRICAL RESULTS**

*A. Single-factor performance mode*

Jensen’s alpha is widely used a measure of abnormal return and is calculated as the difference between what the security actually returned and what it was expected to return. The following equation is obtained by regressing excess mutual fund return on the excess return of the market:

$$R_{it} - R_{ft} = \alpha_i - \beta_i(R_{mt} - R_{ft}) + \epsilon_{it},$$

where  $R_{it}$  is the return of fund  $i$  in month  $t$ ,  $R_{ft}$  is the return on the 90 day bank bill in month  $t$ ,  $R_{mt}$  is the return on the NZX 50 gross index in month  $t$  and  $\epsilon_{it}$  is an error term.

Table 1. Results from the Capital Asset Pricing Model (Jan 2006 – Dec 2010)

Alpha	Beta	Adj. R <sup>2</sup>	Distribution of significant alphas		
			-	0	+
2.24	0.97***	0.94	9%	64%	27%
(1.35)	(29.57)	-	-	-	-

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Table 1 reports the annual Jensen’s alpha for the average domestic equity funds over the 2006 – 2010. This is in consistency with the results obtained by Bauer *et al.* (2006), we find that alpha for domestic equity funds is insignificantly different from zero. When the single factor performance model was run on the individual funds we observe a majority with alpha insignificantly different from zero yet a larger percentage of positive significant alphas (27%) relative to Bauer.<sup>8</sup>

<sup>3</sup> Market capitalisations viewed on 12 May 2011.

<sup>4</sup> It should be noted the stocks used in forming benchmarks are constant throughout the five years of this study period. There has been no attempt to replace the constituents of the NZX 50 with stocks that were previously in the index in the appropriate time period.

<sup>5</sup> New Zealand 90 day bank bill rate is quoted annually but was calculated monthly to allow direct comparison to monthly returns.

<sup>6</sup> Australian companies dual listed in New Zealand have their full market capitalisation taken into account. This overweight ’s their position in factor portfolios. Using the NZX methodology to calculate stock weights of dually listed companies would perhaps yield more accurate results.

<sup>7</sup> Originally proposed by Fama and French (1992).

<sup>8</sup> Two funds were found to have significantly positive alpha. This is similar to Bauer *et al.*, however, their larger sample size leads to a lower overall percentage of outperforming funds.

B. Market timing model

We extend the single-factor performance model to account for the possibility that managers have superior market timing ability. Treynor and Mazuy (1966) explain superior market timing ability by stating, "If they [managers] think the market is going to fall, they shift the composition of the portfolios they manage from more to less volatile securities (including bonds). If they think the market is going to rise, they shift in the opposite direction", (p. 132). Changes in the constituents of a portfolio cause changes in systematic risk. Therefore, as performed by Bauer *et al.* (2006) the addition of the quadratic term to the single-factor performance model is "supposed to capture the possible non-linearity of fund portfolio and market returns." The model is as follows:

$$R_{it} - R_{ft} = \alpha_i - \beta_i(R_{mt} - R_{ft}) + \beta_{iT}(R_{mt} - R_{ft})^2 + \epsilon_{it}$$

Funds whose managers have superior market timing will have a significantly positive  $\beta_{iT}$  co-efficient. Alpha now measures stock selection ability of managers.

Table 2. Results Showing the Timing Abilities of Fund Manager (Jan 2006 – Dec 2010)

Alpha	Market	Timing	Adj. R <sup>2</sup> Cube	Distribution of timing significant coefficients		
				-	0	+
1.53 (0.78)	0.98*** (25.31)	0.37 (0.67)	0.94 -	18% -	73% -	9% -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis; Table 2 shows that on average managers have no significant timing abilities as the co-efficient reported is insignificantly different from zero. When the model is applied to the sample of domestic equity funds individually, we find no evidence of fund managers having significant market timing ability. This result differs to the 10 per cent of funds found in Bauer *et al.* (2006). The alpha estimates are insignificantly different from zero, consistent with the ones observed using the single-factor model.

Bauer *et al.* (2006) adds a cubic term to the market timing model to check for misspecification as measured by the significance of  $\beta_C$  in the following equation:

$$R_{it} - R_{ft} = \alpha_i - \beta_i(R_{mt} - R_{ft}) + \beta_{iT}(R_{mt} - R_{ft})^2 + \beta_C(R_{mt} - R_{ft})^3 + \epsilon_{it}$$

Table 3. Results from the Cubic Model (Jan 2006 – Dec 2010)

Alpha	Market	Timing	Timing Cube	Adj. R <sup>2</sup>	Distribution of significant cubic timing coefficients		
					-	0	+
1.36 (0.67)	0.97*** (16.47)	0.55 (0.72)	3.25 (0.34)	0.94 -	9% -	82% -	9% -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Based on the results in table 3 the co-efficient of the cubic term is insignificant and with its inclusion into the model, the

market timing co-efficient remains also insignificant. This insignificance indicates the market timing model for New Zealand domestic equity funds is not misspecified, and thus observations regarding alpha estimates and the timing ability of fund managers remain valid.

C. Multifactor performance models

Carhart (1997) extended the Fama and French (1993) three-factor model by adding a momentum factor. This four-factor model allows for the possibility of managers using different investment strategies to capture excess return. The SMB (small minus big) factor shows whether management was relying on investing in small cap stocks to earn abnormal return as small firms tend to outperform big ones. The HML (high minus low) factor shows whether a manager is relying on value premium to earn an abnormal return as value stocks tend to outperform growth stocks. The mom (momentum) factor shows whether a manager invests in past winners to generate abnormal return. By including these factors, alpha should show excess return attributable to managements' stock selection ability. The model is stated as follows:

$$R_{it} - R_{ft} = \alpha_i - \beta_{0i}(R_{mt} - R_{ft}) + \beta_1SMB_t + \beta_2HML_t + \beta_3Mom_t + \epsilon_{it}$$

Where,

$R_{it} - R_{ft}$  = the excess fund return,

$R_{mt} - R_{ft}$  = the value weighted excess return on the NZX 50,

SMB = the difference in return between a small cap portfolio and a large cap portfolio,

HML = the difference in return between a portfolio of high book-to-market stocks and a portfolio of low-book-to-market stocks, and

Mom = the difference in return between a portfolio of past winners and a portfolio of past losers.

Table 4. Results from the Multifactor Model (Jan 2006 – Dec 2010)

Alpha	Market	SMB	HML	MOM	Adj. R <sup>2</sup>	Distribution of significant alphas		
						-	0	+
2.48 (1.57)	1.01*** (32.46)	0.04 (1.31)	0.00 (- 0.01)	0.00 (- 0.05)	0.95 -	9% -	82% -	9% -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Table 4 does not provide any significant results regarding fund investment strategies. Bauer *et al.* (2006) finds domestic equity funds are relatively more exposed to small cap stocks and are growth oriented, unfortunately we find no significant evidence to support this. The high adjusted r-squared indicated that our model explains a large amount of the variation in fund returns. The addition of the SMB, HML and Mom variables appear to add very little to the explanatory power of the model. This is shown by the 1% (compared to the single factor) increase in adjusted r-squared and these three factors

Figure 1: NZX50 Index (2005 – 2010)



Source: Yahoo Finance

having insignificant t-statistics. In other words, regardless of the investment strategy used by fund managers over this period, market effects were the main drivers of fund return. These insignificant findings may be the result of the managers altering investment strategies during the time of the GFC. High market uncertainty and volatility are likely to have resulted in large standard errors for the reported coefficients, leading to low t-statistics and hence insignificance of factors.

To examine the effect of the GFC on different investment strategies we run the same regression but over the period prior to recession (pre-September 2008) and the period of and after recession (post-September 2008).

Table 5. Results from the Multifactor Model (Jan 2006 – Dec 2010)

Panel A: Pre-September 2008

Alpha	Market	SMB	HML	MOM	Adj. R <sup>2</sup>	Distribution of significant alphas		
						-	0	+
0.03	1.04***	0.01	0.07	0.10*	0.94	9%	55%	36%
(1.20)	(22.45)	(0.10)	(1.14)	(1.93)	-	-	-	-

Panel A: Post-September 2008

0.02	0.99***	0.05*	-0.05	-0.03	0.96	9%	91%	0%
(0.89)	(25.24)	(1.73)	(-1.01)	(-1.27)	-	-	-	-

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Results from table 5 panel A show a significantly positive momentum factor pre-recession. This indicates that managers on aggregate tended to invest in ‘past winners’ over this period based on return. Figure 1 shows steep upward trend in the pre-recession period, indicating that investing in past winners

may have enabled managers to generate an abnormal positive return. Panel B shows in the midst of the recession and recovery funds tended to invest in small cap stocks, shown by the significant SMB coefficient. The low significance of the SMB factor, along with the insignificant HML and Mom coefficients, could be due to managers not using strategies that are captured by the above factors. Perhaps further research could identify what fund managers were investing in during this period of the recession. Behavioural finance would suggest investors prefer tangible over intangible assets during periods of market downturn, moving away from more speculative investments. Perhaps a variable of interest might be the ratio of tangible assets to total assets to capture returns attributable to this possible investment strategy.

IV. CONCLUSION

This study updates previous work carried out by Bauer *et al.* (2006) in examining the performance of the New Zealand mutual funds. We use three well known performance measurement techniques on a sample of eleven domestic equity funds over the 2006 to 2010 period – a time of tumultuous market performance. We find no evidence of timing ability by fund managers. Using the Carhart four factor model we find on aggregate no significant alpha. However, when examining funds individually we find one fund with significant positive alpha. Additionally, fund return appears to be influenced largely by market movements and not by investment strategy during the economic bubble and subsequent downturn over the entire sample period. Breaking the sample period down into pre-recessionary period and the period that follows, we find significant evidence of momentum investing pre-recession. Conversely, we find significant evidence of small stock investing thereafter.

## APPENDIX

## Appendix 1. Capital Asset Pricing Model

	Alpha	Beta	R <sup>2</sup>
AMP Capital NZ Shares Fund	2.41 (1.56)	1.02*** (33.33)	0.95 -
AMP Capital Strategic NZ Shares Fund	5.18* (1.93)	0.96*** (18.21)	0.85 -
AMP Prem. PUT ACI NZ Shares	5.62*** (2.23)	0.93*** (18.87)	0.86 -
AMP Prem. PUT ACI NZ Shares Index	-2.63** (-2.40)	0.94*** (42.66)	0.97 -
AMP Prem. PUT One Path. NZ Shares	-0.41 (-0.21)	0.79*** (20.20)	0.88 -
Asteron Unit Trusts Socly Resp Inv Tr	1.15 (0.43)	0.99*** (18.59)	0.86 -
Fisher Funds Fledgling Fund	3.38 (0.73)	0.98*** (10.79)	0.67 -
Fisher Funds NZ Growth Fund	6.55 (1.12)	1.13*** (9.97)	0.63 -
NZ Funds Global Invmt Svc Div Yld	0.80 (0.26)	0.71*** (11.74)	0.70 -
OnePath New Zealand Share Fund	0.16 (0.11)	1.10*** (35.07)	0.95 -
TOWER New Zealand Equity Trust	2.80* (1.89)	1.12*** (38.16)	0.96 -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

## Appendix 2. Timing Abilities of Fund Manager: Treynor and Mazuy

	Alpha	Market	Timing	R <sup>2</sup>
AMP Capital NZ Shares Fund	0.73 (0.41)	1.05*** (29.70)	0.87 (1.76)	0.95 -
AMP Capital Strategic NZ Shares Fund	4.40 (1.38)	0.97*** (15.57)	0.39 (0.45)	0.85 -
AMP Prem PUT ACI NZ Shares	4.93* (1.65)	0.94*** (16.11)	0.34 (0.42)	0.86 -
AMP Prem PUT ACI NZ Shares Index	0.00 (-0.00)	0.89*** (39.10)	-1.40*** (-4.36)	0.98 -
AMP Prem PUT OnePath NZ Shares	1.70 (0.74)	0.75*** (16.51)	-1.10* (-1.73)	0.88 -
Asteron Unit Trusts Socly Resp Inv Tr	1.29 (0.40)	0.99*** (15.58)	-0.07 (-0.08)	0.85 -
Fisher Funds Fledgling Fund	0.33 (0.06)	1.04*** (9.71)	1.58 (1.04)	0.66 -
Fisher Funds NZ Growth Fund	3.14 (0.46)	1.20*** (8.92)	1.72 (0.91)	0.62 -
NZ Funds Global Invmt Svc Div Yld	-1.07 (-0.30)	0.75*** (10.47)	0.99 (0.98)	0.70 -
OnePath New Zealand Share Fund	-0.54 (-0.29)	1.11*** (29.99)	0.37 (0.71)	0.95 -
TOWER New Zealand Equity Trust	2.11 (1.20)	1.13*** (32.62)	0.36 (0.73)	0.96 -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

## Appendix 3. Cubic Model

	Alpha	Market	Timing	Timing Cube	R <sup>2</sup>
AMP Capital NZ Shares Fund	1.34 (0.73)	1.10*** (20.93)	0.23 (0.33)	-11.70 (-1.35)	0.95 -
AMP Capital Strategic NZ Shares Fund	4.87 (1.47)	1.01*** (10.73)	-0.09 (-0.07)	-8.69 (-0.56)	0.84 -
AMP Prem PUT ACI NZ Shares	5.12 (1.64)	0.95*** (10.81)	0.16 (0.14)	-3.38 (-0.23)	0.85 -
AMP Prem PUT ACI NZ Shares Index	0.06 (0.05)	0.90*** (25.98)	-1.47*** (-3.26)	-1.22 (-0.22)	0.98 -
AMP Prem PUT OnePath NZ Shares	1.35 (0.57)	0.72*** (10.49)	-0.74 (-0.83)	6.55 (0.59)	0.88 -
Asteron Unit Trusts Socly Resp Inv Tr	1.29 (0.39)	0.99*** (10.29)	-0.08 (-0.06)	-0.12 (-0.01)	0.85 -
Fisher Funds Fledgling Fund	-0.16 (-0.03)	1.00*** (6.15)	2.10 (0.99)	9.48 (0.36)	0.66 -
Fisher Funds NZ Growth Fund	2.12 (0.30)	1.11*** (5.47)	2.78 (1.05)	19.20 (0.58)	0.62 -
NZ Funds Global Invmt Svc Div Yld	-1.46 (-0.39)	0.71*** (6.61)	1.40 (0.99)	7.45 (0.42)	0.69 -
OnePath New Zealand Share Fund	-1.37 (-0.73)	1.04*** (19.02)	1.26* (1.78)	16.13* (1.81)	0.96 -
TOWER New Zealand Equity Trust	2.00 (1.09)	1.12*** (21.36)	0.47 (0.69)	2.09 (0.24)	0.96 -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

## Appendix 4. Multifactor Model

	Alpha	Market	SMB	HML	MOM	R <sup>2</sup>
AMP Capital NZ Shares Fund	1.71 (1.07)	1.01*** (31.64)	0.04 (1.27)	0.01 (0.16)	0.01 (0.25)	0.95 -
AMP Capital Strategic NZ Shares Fund	4.24 (1.58)	0.93*** (17.58)	0.10** (2.09)	-0.04 (-0.66)	0.06 (1.54)	0.85 -
AMP Prem PUT ACI NZ Shares	4.71* (1.86)	0.90*** (18.13)	0.09** (2.02)	-0.04 (-0.57)	0.05 (1.36)	0.86 -
AMP Prem PUT ACI NZ Shares Index	-3.87*** (-3.70)	0.93*** (43.40)	0.05** (2.44)	-0.06** (-2.31)	-0.01 (-0.44)	0.97 -
AMP Prem PUT OnePath NZ Shares	-1.54 (-0.80)	0.78*** (20.12)	-0.02 (-0.58)	-0.04 (-0.78)	0.02 (0.74)	0.88 -
Asteron Unit Trusts Socly Resp Inv Tr	-0.07 (-0.02)	0.98*** (17.81)	-0.01 (-0.25)	-0.05 (-0.67)	0.02 (0.41)	0.85 -
Fisher Funds Fledgling Fund	2.13 (0.47)	0.94*** (10.37)	0.18** (2.29)	-0.10 (-0.89)	0.07 (1.05)	0.68 -
Fisher Funds NZ Growth Fund	5.48 (0.94)	1.09*** (9.58)	0.21** (2.17)	-0.09 (-0.60)	0.08 (0.94)	0.64 -
NZ Funds Global Invmt Svc Div Yld	17.64 (0.30)	0.14** (1.82)	-0.10* (-1.91)	0.73*** (11.78)	0.00 (0.33)	0.70 -
OnePath New Zealand Share Fund	-0.47 (-0.29)	1.10*** (33.96)	-0.02 (-0.69)	0.03 (0.76)	-0.02 (-0.81)	0.95 -
TOWER New Zealand Equity Trust	1.94 (1.29)	1.11*** (37.07)	0.03 (1.00)	-0.01 (-0.18)	-0.01 (-0.27)	0.96 -

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Appendix 5. Multifactor Model Pre-recession

	Alpha	Market	SMB	HML	MOM	R <sup>2</sup>
AMP Capital NZ Shares Fund	0.03 (1.43)	1.04*** (22.32)	0.01 (0.07)	0.07 (1.10)	0.10* (1.88)	0.94 -
AMP Capital Strategic NZ Shares Fund	0.08** (1.98)	0.92*** (12.21)	-0.03 (-0.24)	0.05 (0.52)	0.20** (2.36)	0.83 -
AMP Prem PUT ACI NZ Shares	0.08** (2.35)	0.89*** (13.22)	-0.03 (-0.27)	0.05 (0.57)	0.19** (2.57)	0.85 -
AMP Prem PUT ACI NZ Shares Index	-0.05*** (-3.55)	0.85*** (28.42)	0.13*** (2.86)	-0.13*** (-3.39)	-0.03 (-0.93)	0.96 -
AMP Prem PUT OnePath NZ Shares	-0.02 (-0.75)	0.76*** (16.19)	0.00 (-0.04)	-0.02 (-0.36)	0.01 (0.14)	0.89 -
Asteron Unit Trusts Socly Resp Inv Tr	0.00 (0.11)	0.99*** (11.33)	-0.27** (-2.04)	0.10 (0.88)	0.16 (1.62)	0.81 -
Fisher Funds Fledgling Fund	0.07 (1.10)	1.01*** (8.48)	0.13 (0.71)	0.15 (0.97)	0.42*** (3.21)	0.72 -
Fisher Funds NZ Growth Fund	0.14* (1.66)	1.20*** (7.57)	0.22 (0.92)	0.21 (0.99)	0.49*** (2.79)	0.67 -
NZ Funds Global Invmt Svc Div Yld	11.03** (2.91)	0.16* (1.72)	-0.28*** (-2.65)	0.92*** (12.77)	0.00 (1.05)	0.85 -
OnePath New Zealand Share Fund	0.00 (0.13)	1.17*** (25.84)	-0.02 (-0.23)	0.08 (1.28)	0.04 (0.72)	0.96 0.00
TOWER New Zealand Equity Trust	0.03 (1.41)	1.08*** (24.78)	-0.01 (-0.20)	0.05 (0.82)	0.04 (0.82)	0.95 0.00

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

Appendix 6. Multifactor Model Post-recession

	Alpha	Market	SMB	HML	MOM	R <sup>2</sup>
AMP Capital NZ Shares Fund	0.00 (-0.22)	0.98*** (23.66)	0.05 (1.52)	-0.03 (-0.60)	-0.02 (-0.93)	0.96 -
AMP Capital Strategic NZ Shares Fund	0.00 (-0.11)	0.95*** (13.46)	0.10** (1.98)	-0.06 (-0.61)	0.01 (0.28)	0.89 -
AMP Prem PUT ACI NZ Shares	0.00 (-0.00)	0.93*** (13.46)	0.09* (1.74)	-0.03 (-0.38)	0.00 (-0.03)	0.89 -
AMP Prem PUT ACI NZ Shares Index	-0.03*** (-3.02)	1.01*** (56.42)	0.00 (0.15)	0.01 (0.58)	-0.01 (-0.99)	0.99 -
AMP Prem PUT OnePath NZ Shares	-0.01 (-0.36)	0.79*** (11.60)	-0.01 (-0.25)	-0.07 (-0.80)	0.03 (0.64)	0.85 -
Asteron Unit Trusts Socly Resp Inv Tr	-0.01 (-0.51)	0.96*** (17.39)	0.03 (0.77)	-0.09 (-1.28)	-0.02 (-0.48)	0.93 -
Fisher Funds Fledgling Fund	-0.04 (-0.70)	0.89*** (7.27)	0.22** (2.46)	-0.29* (-1.84)	-0.04 (-0.57)	0.73 -
Fisher Funds NZ Growth Fund	-0.05 (-0.70)	1.00*** (7.26)	0.26** (2.56)	-0.33* (-1.85)	-0.06 (-0.70)	0.73 -
NZ Funds Global Invmt Svc Div Yld	-0.44 (-1.22)	0.25*** (2.97)	-0.11** (-2.32)	0.56*** (8.54)	0.00 (-0.90)	0.72 -
OnePath New Zealand Share Fund	-0.01 (-0.56)	1.02*** (22.97)	0.00 (0.03)	-0.03 (-0.48)	-0.03 (-1.18)	0.96 0.00
TOWER New Zealand Equity Trust	0.00 (0.16)	1.13*** (27.11)	0.03 (1.13)	-0.04 (-0.72)	-0.02 (-0.92)	0.97 0.00

\*\*\* Significant at the 1% level. \*\* Significant at 5%. \* Significant at 10%; All alphas are annualised; T-statistics in parenthesis;

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