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Fundamental Investment Research – Do US results apply to Australian Investors?

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ABSTRACT

For many investors, the Financial Crisis of 2008 and 2009 has sparked renewed interest in Value-based investment approaches. There is much published research supporting the use of fundamental analysis for value-based investment, and much of this research comes from the US. In previous articles, we have shown that US based fundamental investment research does not translate well to the Australian market. In this paper, we show how to test a well documented US fundamental investment strategy and find that it also does not transfer well to our Australian market.

1. INTRODUCTION

The investment models used by most institutions and investors are easily classified as either Growth-based or Value-based. Typically, growth-based models perform well during bull market periods, and perform poorly during bear markets. Value-based models typically underperform during bull market phases, but are less subject to large drawdowns during bear markets.

The objective of value-based approaches is to attempt to buy stocks when they are underpriced, and sell them when they become overpriced. The difficulty, of course, is in trying to determine just how far a stock's price may fall, and at what level it really represents a bargain.

The danger of simply selecting stocks which are trading at very low prices is that there may be some fundamental reason why the stocks are priced so low. For example, the company which issues the stocks may be performing poorly, or facing difficult competition in its market. Alternatively, the stock prices of a company may simply just be poorly priced, and the low price may not fully reflect the issuing companies' future potential.

To try and differentiate between these two possibilities, practitioners often rely on fundamental analysis, or fundamental variables. The source of these variables is generally from companies published financial statements.

Essentially, what value-based investors attempt to do is to screen stocks based on the values of these fundamental variables, to sift out those which do not have good future prospects, as measured by the company results.

One of the main difficulties with this type of approach is that it takes many years of data for many companies before rules can be defined and tested. Due to the large size of the US markets, it is perhaps unsurprising the many of the published fundamental research strategies originate there.

Many Australian investors read US published research, and implement the same ideas in the Australian marketplace. However, Australian investors do not appear to value the same fundamental characteristics as US investors. This can result in well documented, well published US strategies performing poorly, or failing altogether when applied to the Australian market.

This paper demonstrates the process we use to determine whether a specific US based fundamental strategy can be successfully applied in the Australian market. Here, we conduct this process using the fundamental filters published by Aby et al [1, 2] as an example.

Aby et al. [1] focus on combining fundamental variables to screen stocks for value. Aby et al. developed portfolios based on four fundamental conditions, namely:

Single Valued P/E (P/E<10),
Market Price < Book Value,
established track record of return on Shareholder Equity (ROE > 12%), and,
Dividends paid out less than 25% of earnings.

They concluded that when the four criteria are used to screen stocks, quality investments seem to result.

It is interesting to note that in earlier work by Aby et al. [2], the authors had focused on shares with simply a low P/E and a market price below book value (the first two conditions), and had concluded that this filter method did not produce satisfactory returns.

2. METHODOLOGY

One of the challenges of benchmarking a set of filter rules is that they are selective as to when they enter and exit the market. For this reason, to draw sensible comparisons, it is necessary to use a market benchmark which is constructed to be a suitable comparator.

For this paper, the following methodology is used:

1. Create a set of all the transactions (matched buys/sells) as indicated by applying the four filter rules. The starting capital for each transaction is $10,000.

2. For every transaction created by the filter rules, create an identical transaction, which buys and sells on the same dates, in the underlying benchmark, the XAO index. The starting capital for each of these transactions is also $10,000.

In this way, there are two sets of trades – one set of trades produced on those companies identified by the four filter rules, and one matching set of trades on the comparison benchmark. Both sets of trades have covered exactly the same time periods, and (initially) had the same amount of capital exposed.

Then, ANOVA tests can be used to determine whether the two sets of trades are significantly different from each other, and hence reveal whether there is any benefit to be expected from using these filters.

This paper aims to test performance of the Aby et al. filters in the Australian market. In total, there are two sets of trades that need to be created, namely:

1. '4FAF' (4 Factor Aby Filter) – All the trades produced by the four filter rules

2. 'Market' - the comparable trades produced for the market benchmark, using the methodology described above

One of the primary purposes of this study is to document the returns to the Aby filters in the Australian stockmarket. To do this, the data used in the study consists of the members of the ASX Fully Paid Ordinaries, starting in 1992 and ending in 2008. Where possible, this data has been adjusted for delistings, name changes, stock splits, etc. The comparison benchmark is the XAO (All Ordinaries Index). All buy/sell signals are taken in the presence of transaction costs ($50 each way), and an allowance for slippage (0.5%) is made on both buy and sell signals. As this study is a study of the raw returns to the Aby filters, the effect of dividend payments are not included.

3. ANALYSIS

The following tables show the results from each of the different tests that were performed.

Table 1 shows some of the basic characteristics of each of the above sets of transactions.

Characteristic	**'4FAF'**	**'Market'**
Average profit per day	$ 19.71	$ 0.84
Average Profit/Loss %	39.28 %	2.29%
% of winning Trades	44.83 %	63.79%
Average Profit/Loss % (Winning Trades)	127.97 %	14.59%
Average Profit/Loss % (Losing Trades)	-32.79 %	-19.38%
Number of transactions	174	174
Average Holding Period	273 days	273 days

Table 1 Characteristics of trades initiated by filters

In their original paper, Aby et al. determined that the '4FAF' trades did outperform their benchmark.

Using the individual trade sets created during the formation of '4FAF' and 'Market', ANOVA tests can be performed to determine the answers to the following questions:

1. Does the '4FAF' set of trades (and hence the four filter rules) outperform its benchmark?

2. How 'achievable' are these results?

The ANOVA test allows for a comparison of sets of trades to determine whether they are significantly different from each other. The variable chosen for comparison from each set of trades is the Net Profit per Day (profit after costs/slippage, etc).

For question 1, "Does the '4FAF' set of transactions (and hence the four filter rules) outperform its benchmark?", the ANOVA test shows that the two sets of trades are very different, specifically $F(1,346)=4.643$, $p=0.032$ ($p<0.05$). In other words, the set of trades produced by the '4FAF' rules are very different from the market trades, and the results show that the '4FAF' trades are much more profitable.

Table 2 provides descriptive information concerning the two sets of trades compared above.

Set	**Mean**	**95% Confidence Interval for Mean (Lower)**	**(Upper)**
4FAF	16.187	0.462	31.912
Market	-1.085	-2.827	0.656

Table 2 Descriptives: 4FAF and Market

To answer question 2, 'How achievable are these results?', a minimum market capitalization filter was added. To enable a stock to be 'bought', a minimum market capitalization of $50m was chosen. The tests were then rerun, and the results were then re-analysed.

Characteristic	'4FAF' with Market Cap filter ('4FAFM')
Average profit per day	$ 47.93
Average Profit/Loss %	14.15 %
% of winning Trades	33.33 %
Average Profit/Loss % (Winning Trades)	103.52 %
Average Profit/Loss % (Losing Trades)	-30.53 %
Number of transactions	27
Average Holding Period	228 days

Table 3 Characteristics of trades initiated by filters

Set	Mean	95% Confidence Interval for Mean (Lower)	(Upper)
4FAFM	26.920	-51.051	104.891
Market equivalent	-7.71	-12.689	-2.736

Table 4 Descriptives: 4FAFM and Market equivalent

After examining the trades resulting from the '4FAFM', it is apparent that there is a heavy right tail. The question is if this is a result of the filter or just random occurrences. The dataset may in fact be biased with respect to fundamental values since it covers the bursting of the dot-com bubble, which saw a return to a traditional valuation approach, at least for some time.

In the absence of a longer time horizon or additional information about the underlying valuation processes, the set of trades was further constrained to those trades within three standard deviations of the mean. This process retains the vast majority of trades while removing what could be outliers, i.e. trades not representative of the true relationship between the filter rules and the expected return. This outlier removal process actually only removed 1 trade.

Figure 1 shows the histogram of profit per bar values for the '4FAFM' model before the outliers have been removed. A normal curve is included.

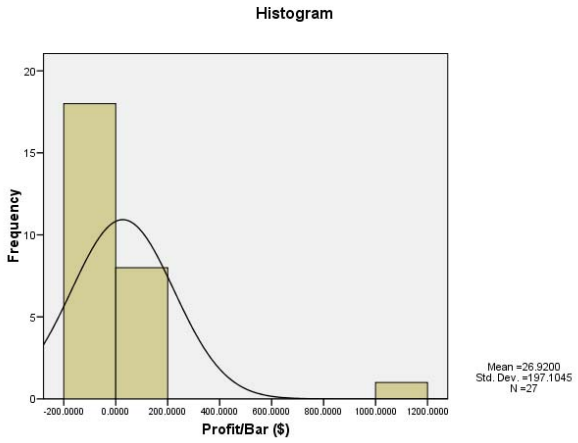

Figure 1 '4FAFM' model with outliers

Figure 2 shows the effect that outlier removal has had on the distributions of profit per bar. Again, a normal curve is included.

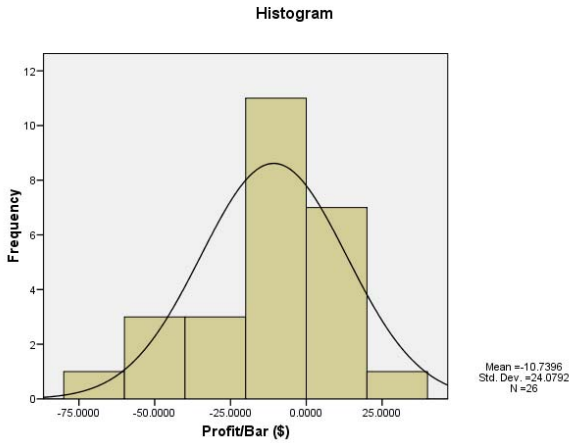

Figure 2 '4FAFM' excluding outliers

Table 5 shows the number of trades and the mean of those trades for the '4FAFM' with and without the outlier. Clearly, the removal of the one outlier has significantly affected the results. Now the model is performing worse than the overall market.

Model	Mean	Number
4FAFM	26.92	27
4FAFM excl outliers	-10.739	26
4FAFM market equivalent	-7.71	

Table 5 Model comparisons with and without outliers

4. DISCUSSION OF RESULTS

Aby et al. found that their model with 4 factors performed much better than the overall market. However, in the Australian market, a different conclusion exists.

In the Australian market, the 4 factor model appears to outperform. However, when the universe of stocks is constrained to those that are liquid, and the one massive

outlier is removed, it can be seen that the 4 factor model significantly underperforms the market.

5. CONCLUSION

Although the premise on which the Aby filters are built seems sound, it is clear that the filters underperform in the Australian market, and are therefore unsuitable for Australian investors.

Given the quantity of research which supports the use of each of these fundamental variables, it is possible that the cutoff values applied in the filter rules are too strict for the Australian market. The cutoff values used by Aby et al. are anecdotal values at best, and it is unclear how new cutoff values should be established.

In previously published work concerning fundamental investment strategies [3], the authors have benchmarked other fundamental based techniques, and found that although they appeared successful in the US markets, in some cases that same success did not transport to the Australian market.

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