SEASONALITY IN momentum profitability

In Australia, and around the world, momentum trading generates economically and statistically significant profits. This paper documents seasonalities in momentum profitability rather than examining returns averaged across all months. We report a strong reversal around the financial year end and apparent quarter-end seasonality in momentum profits. Preliminary tests support the hypothesis that seasonality in quarterly equity returns is driven by window dressing by institutional investors.

Momentum trading refers to a strategy that enters long positions in recent winners and short positions in recent losers. Academic research documents economically and statistically significant momentum returns in many global equity markets. As such, the momentum phenomenon has had a profound impact on both academic research and investment practice. While academics continue to search for a better understanding of the anomaly, momentum filters are an important component of many fund managers’ stock selection process.

Australia is no exception when it comes to interest in momentum profitability, with numerous studies existing on this topic. While, at face value, some findings appear to be conflicting, the different conclusions reached are largely attributable to the ways in which stocks are weighted within portfolios. In general, the evidence in favour of momentum profitability is overwhelming when stocks are weighted in portfolios according to their market capitalisations (i.e. value weighted), and less convincing when stocks are equally weighted. Naturally, this suggests that momentum is stronger among large-cap stocks, which carry more influence on portfolio returns under value weighting.

In documenting momentum profitability, it is common to report the average monthly return differential between portfolios taking long positions in past winners and short positions in past losers. For example, over the 1974–2012 period, this paper finds that a long-short momentum strategy on Australian equities generates an average monthly return of 1.72 per cent (t=3.69). Note that this result effectively averages momentum profits across all calendar months. While findings like this are common in the momentum literature, it is rare to see the profitability broken down to a month-by-month analysis. This is surprising, especially given that seasonalities in equity returns are well documented.

This paper, therefore, examines the seasonality of momentum profits. Rather than reporting an overall average monthly momentum profit, we tabulate momentum profits separately for each calendar month. There are several attractive reasons to study momentum seasonality. First, in the event that distinct seasonalities exist, there are obvious implications for professional traders. Second, from an academic perspective, documenting seasonalities may guide efforts to better understand what drives the momentum phenomenon.

Data and methodology
Our data are sourced from the Share Price and Price Relative (SPPR) file maintained by Securities Industry Research Centre of Asia-Pacific (SIRCA). Monthly return and market capitalisation data is obtained for all ASX-listed ordinary stocks over the 1974–2012 period.

Previous Australian studies report strong momentum profits over medium-term horizons of six to 12 months (see, for example, Demir et al. 2004; Brailsford and O’Brien 2008). For consistency, we adopt a six-month period over which past performance is ranked, and a six-month period over which momentum is tested. Starting in June 1974, past momentum is calculated for all stocks that have a valid trade price at both 31 December 1973 and
30 June 1974 (dividends paid over this period are also included in the return). Stocks are sorted into 10 portfolios on the basis of this past momentum, with winners (losers) comprising the 10 per cent of stocks with the best (worst) past six-month performance. The weight given to each stock in a portfolio reflects its market capitalisation (i.e. they are value-weighted portfolios). Once established, the portfolio is held without rebalancing from July to December 1974. The return to each portfolio is calculated in each of the six holding period months. In December 1975, the ranking process is repeated and portfolios are reformed for another six months.

This portfolio formation procedure is repeated every six months through to (and including) June 2012. This generates a time series of 462 monthly returns to the 10 momentum portfolios spanning July 1974 through to (and including) December 2012. The momentum profits reported in this paper are calculated as the difference between the returns to the winner and loser portfolios. With nearly 40 years of data, it is unlikely that the results will be unduly affected by one or two unusual months.

Results
As noted above, the overall return to momentum trading during our sample is 1.72 per cent per month (i.e. averaged over all months). Figure 1 breaks this down by calendar month. Two particular facets warrant discussion. First, the most distinctive feature is the large positive return in June (3.23 per cent) followed immediately by a large negative return in July (-2.39 per cent). Given that these returns straddle the financial year end, it is natural to think that tax incentives may drive this seasonality. Turn-of-the-year seasonal returns are often attributed to tax-loss selling, whereby investors dump holdings of stocks that have performed poorly in order to realise tax deductible losses prior to the year end. While this argument is often made to explain seasonality in the market as whole, it is acutely relevant in a study of winners and losers.

We explore the tax-loss selling argument further by considering the unique contribution of winners and losers to the overall momentum profit in June. Although not explicitly shown in Figure 1, the short positions in losers (3.92 per cent) account for most of the momentum profits in June (3.23 per cent). This finding is consistent with the conjecture that investors who inadvertently find themselves taking long positions in these loser stocks as the financial year end approaches may sell out for tax reasons. The downward selling pressure manifests itself in large negative returns to these losers in June, which benefits momentum traders holding short positions in losers. Curiously, in July, the losers (5.24 per cent) rebound with such strength that they dwarf the winners (2.85 per cent), thereby driving the momentum loss in July (-2.39 per cent). This July ‘contrarian’ (or negative momentum) effect has also been documented by Durand et al. (2006).

The second notable aspect of Figure 1 is a quarter-end momentum effect. This is more readily apparent when concentrating on statistical significance (denoted by asterisks). While momentum profits are positive in every month except July, they are only statistically significant in March, June, September, November and December. Sias (2007) reports a similar pattern in US momentum profits, which he attributes to ‘window dressing’. He conjectures that institutional investors may abandon losers to avoid reporting embarrassing stocks in their holdings. Similarly, they may make last-minute purchases of winners to give the appearance that they held respectable stocks throughout the period (Sias 2007, p. 48). Such behaviour is likely to cluster in quarter-ending months and/or at the end of the financial year, thereby contributing to the momentum seasonality. In Australia, at the end of the financial and calendar years, it is common to see media coverage on the best- and worst-performing stocks. Consistent with this, momentum profits in June and December are among the strongest.

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We explore the window dressing story as follows. If quarterly seasonality in momentum profitability is an outcome of window dressing, then the quarterly effect should become stronger over time as the prominence of institutional investors has increased. The introduction of the Australian Superannuation Guarantee Scheme (SGS) in 1992 provides an ideal setting in which to test this hypothesis. The SGS requires employers to make compulsory superannuation contributions on behalf of their employees. Originally set at 3 per cent of the employee’s income, the rate is currently 9.25 per cent and will progressively increase to 12 per cent by 2019. As a direct consequence of the SGS, Australia now has one of the largest managed fund industries in the world, with approximately $1.8 trillion in funds under management. Superannuation funds have clearly been the key driver in the significant growth in the Australian managed fund industry, accounting for over 80 per cent of total market share.
Accordingly, we analyse seasonality in momentum profitability over two different periods: the pre-SGS period covering 1974 to (July) 1992, and (ii) the post-SGS period covering (July) 1992 to 2012. Figure 2 depicts the average monthly momentum profits for the pre- and post-SGS periods. Separate results are shown for averages over all months, quarter-end months, non-quarter-end months, and non-quarter-end months (ex. July).7

In the pre-SGS period, there is little discernible difference in momentum profits during quarter-end months (0.82 per cent), non-quarter-end months (0.51 per cent) and non-quarter-end months (ex. July) (0.68 per cent). Statistical tests (not explicitly reported) cannot detect a difference in momentum profits between quarter-end and non-quarter-end months in the pre-SGS period. In fact, overall momentum profitability in this period (0.61 per cent) is statistically insignificant.

After the introduction of the SGS in 1992, the profitability of momentum trading clearly increases. The average monthly return rises from 0.61 per cent to 2.70 per cent (highly significant). Further, post-SGS, quarter-end months generate momentum profits of 4.58 per cent, which are significantly higher than non-quarter-ending months (1.76 per cent). Even excluding July, the quarter-end return was still 2 per cent per month higher.

The dramatic difference pre- and post-SGS raises the question of whether the seasonality depicted in Figure 1 manifests across the entire sample, or whether it may be driven in the post-SGS period. Figure 3, which presents the average momentum profits on a month-by-month basis separately for the pre- and post-SGS periods, suggests the latter. The top diagram (pre-SGS period) shows little consistency in momentum profits, little evidence of statistical differences from zero, no turn-of-the-year effect, and no evidence of quarter-end seasonality. In contrast, the bottom diagram (post-SGS) shows that momentum trading has been consistently profitable (both economically and statistically) since 1992. The turn-of-the-year effect is prominent. Quarter-end months (shown in teal) are highly profitable and statistically significant.

Conclusions

While most studies focus on the average profitability of momentum trading (i.e. when averaged across all months), this study examines seasonality in momentum profits.

We document a distinct turn-of-the-year effect and strong quarterly effects. There is anecdotal evidence that tax-loss selling and window dressing by institutional investors contribute to these patterns. Further, these patterns only exist during the past 20 years. The key findings appear to be driven exclusively by the period that followed the introduction of the SGS in 1992. In fact, momentum trading appears unprofitable prior to 1992.

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While it is difficult to attribute this entirely to the introduction of the SGS and the resulting boom in the managed funds industry, further research may shed light on how the increasing prominence of institutional investors contributes to the momentum phenomenon.

**Figure 1: Momentum profitability by month, 1974 to 2012**

This figure shows the average momentum profitability in each calendar month. Momentum profit is the difference in return on a portfolio long past winners and short past losers. The sample spans 1974 to 2012. Quarter-end months are differentiated with darker shading. ***, ** and * signal that the reported return is statistically different from zero at the 1%, 5% and 10% confidence levels, respectively.
FIGURE 2: Comparison of momentum profitability in pre- and post-SGS periods

This figure compares momentum profitability before and after the introduction of the Superannuation Guarantee Scheme in June 1992. Momentum profit is the difference in return on a portfolio long past winners and short past losers. For each subperiod, we report the average monthly momentum profits for (i) all months, (ii) non-quarter-ending months, (iii) non-quarter-ending months (excluding July) and (iv) quarter-ending months.

FIGURE 3: Seasonality in momentum profits pre-SGS and post-SGS

This figure shows the average momentum profitability in each calendar month. Momentum profit is the difference in return on a portfolio long past winners and short past losers. The top (bottom) panel shows seasonality on momentum profits before (after) the introduction of the Superannuation Guarantee Scheme in June 1992. Quarter-end months are differentiated with darker shading. ***, ** and * signal that the reported return is statistically different from zero at the 1%, 5% and 10% confidence levels, respectively.
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Endnotes
1 Vanstone, Hahn and Finnie (2013) provide a succinct summary of the Australian momentum literature, as well providing further evidence of momentum profitability among the S&P/ASX 100 stocks.
2 This point is borne out in studies by Brailsford and O’Brien (2008), O’Brien et al. (2010), Dou et al. (2013) and Gray (2014), all of which present results under both value- and equal-weights. Gray (2014) presents a separate analysis of momentum within the top 500 stocks and shows it is stronger than in the population.
3 Even when studies weight stocks equally, the strength of momentum profits is apparent when analysis is restricted to large caps (see Hurn and Pavlov 2003; Demir et al. 2004; Bettman et al. 2009).
4 This is a ‘non-overlapping’ approach to implementing momentum trading. Many academic papers form momentum portfolios monthly, which implies that a series of overlapping portfolios are held at any given point in time. From a practical perspective, the transaction costs involved in maintaining overlapping portfolios would be non-trivial. Nonetheless, the findings of the paper are virtually unchanged when overlapping portfolios are used. Similarly, robustness analysis shows that the findings are not sensitive to the choice of June and December as the portfolio formation points, or skipping one month between identification of winners/losers and entering long/short positions. Full results for this robustness analysis are available on request.
5 The pattern of momentum profits around the financial year end shown in Figure 1 is remarkably similar to US findings reported by Sias (2007). Noting that the US has a December financial year end, Sias (2007) documents large positive momentum profits in December on average, and large negative profits in January.
7 The large negative July return shown in Figure 1 has the potential to confound results for non-quarter-end months. Hence, we also consider non-quarter-end months excluding July.

References