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INVESTMENT MANAGERS

# Window dressing on the JSE

Are month-end closing prices manipulated  
higher to flatter fund performance?

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## Window dressing on the JSE

Spend any time in the equity market and you will hear claims of month-end window dressing - fund managers pushing the month-end closing prices of the stocks they own higher to flatter their performance at the end of the month.

Every fund manager who has ever underperformed into a month-end has been highly convinced that this phenomenon is real and widespread and as Charlie Munger has said “show me the incentive, I’ll show you the outcome”. And the incentives for this behaviour are strong, with performance ranking tables, performance fees, mandate awards and portfolio manager bonuses all dependent on fund performance at month and quarter ends.

So, having anecdotes, means and motive, we thought we would look at some data to see if it can find hard evidence of this behaviour.

### **We look at three different tests that may support or refute the claims of window dressing:**

1. Are average stock returns higher on month-end trading days?
2. How do month-end close prices compare to the Volume Weighted Average Price (VWAP) over the day?
3. Do month-end moves tend to reverse the next day?

We performed these tests on the 164 stocks that made up the JSE All Share index at the end of 2018 using daily share price data over the period from 2013 to 2018.

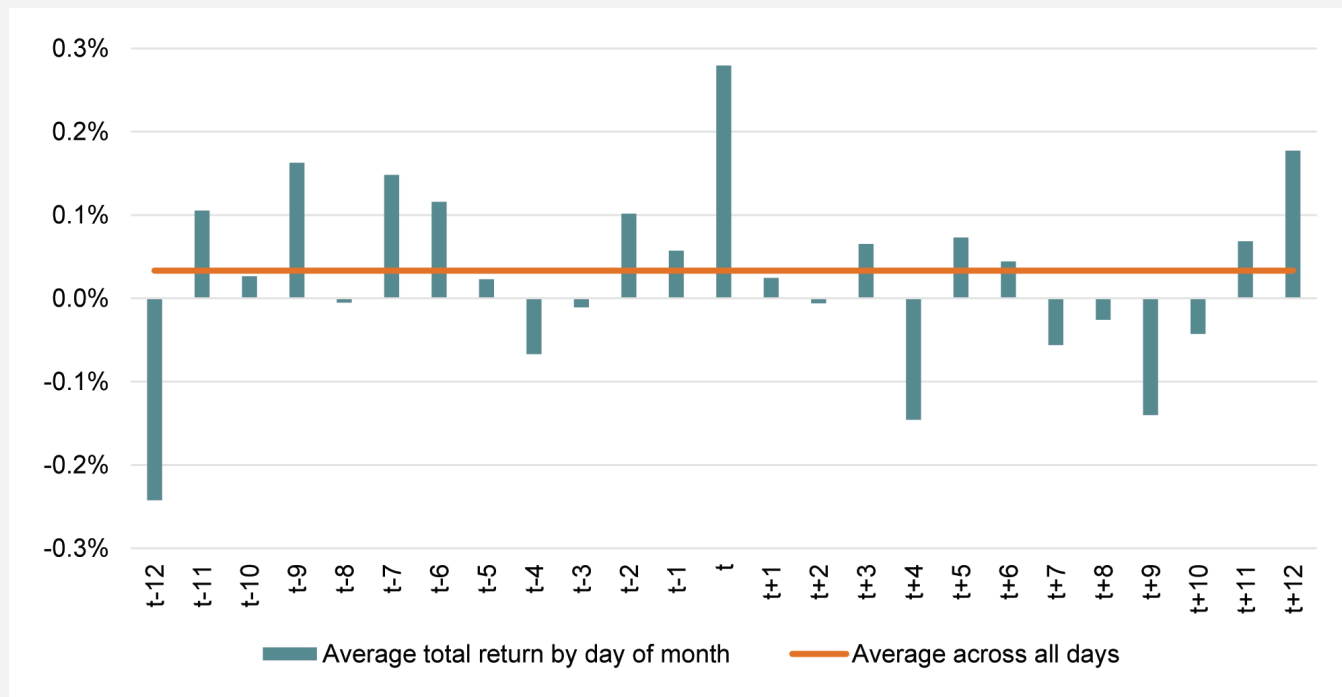
### **Are average stock returns higher on month-end trading days?**

The Turn of the Month Effect, the fact that equity indices perform well over the end of the month, is well documented in the financial literature.



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Most of the literature focuses on index level performance at the end of the month. If fund managers do buy shares into month-end to try and manipulate their prices higher, we would expect to see higher returns, on average, on the last day of the month; and for this to be observed across the stocks in the universe. We tested this hypothesis by measuring the average total return on the last trading day of the month; and grouping the days of the month depending on their position relative to the month-end.



The chart above shows that the last trading day of the month has indeed shown higher returns for stocks than any other day of the month. While this is consistent with month-end window dressing, a number of other hypotheses have been put forward to explain this effect. One explanation is the Pay-day Effect; pay-day at the end of the month leads to pension fund contribution and other savings being directed to investment portfolios.

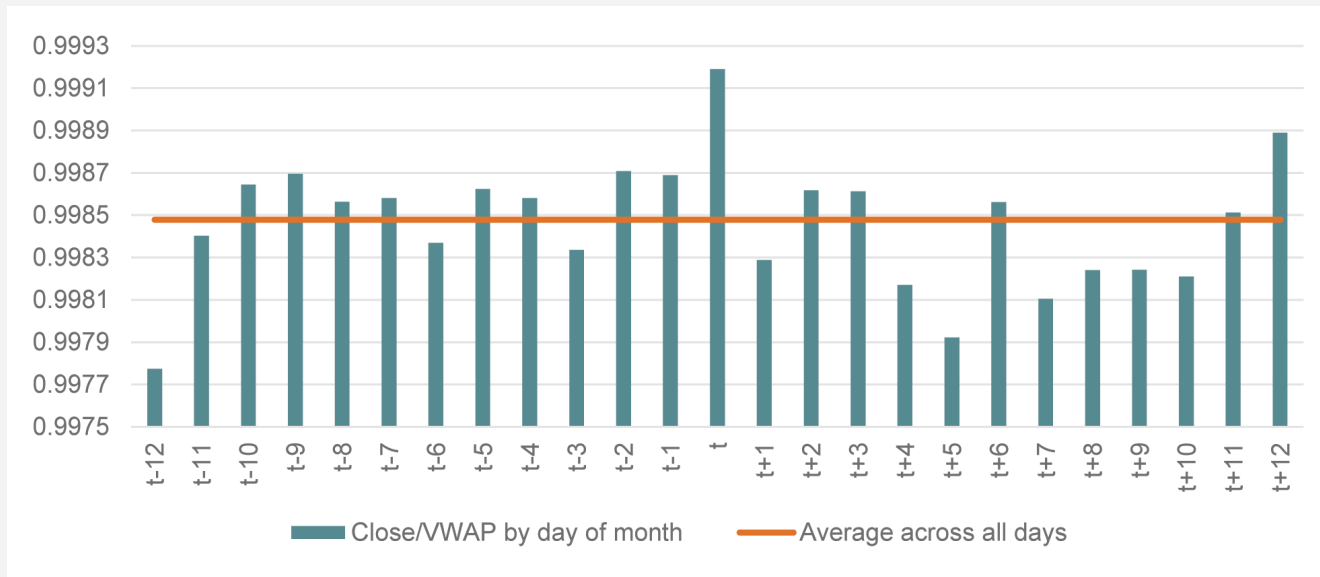


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These portfolios receive inflows into their funds and need to invest these into the market, leading to net buying into the end of the month.

## How do month-end close prices compare to the VWAP over the day?

To manipulate the month-end price of a share, one only needs to manipulate the closing price on the day. This suggests that window dressing would cause close prices to be higher than the volume weighted average price over the day.



As the chart above shows, the last trading day of the month has historically had the highest ratio of closing price versus average price over the day compared to any other day during the month, suggesting that the last trading day of the month exhibits the strongest closing auction with prices moving higher into the close.

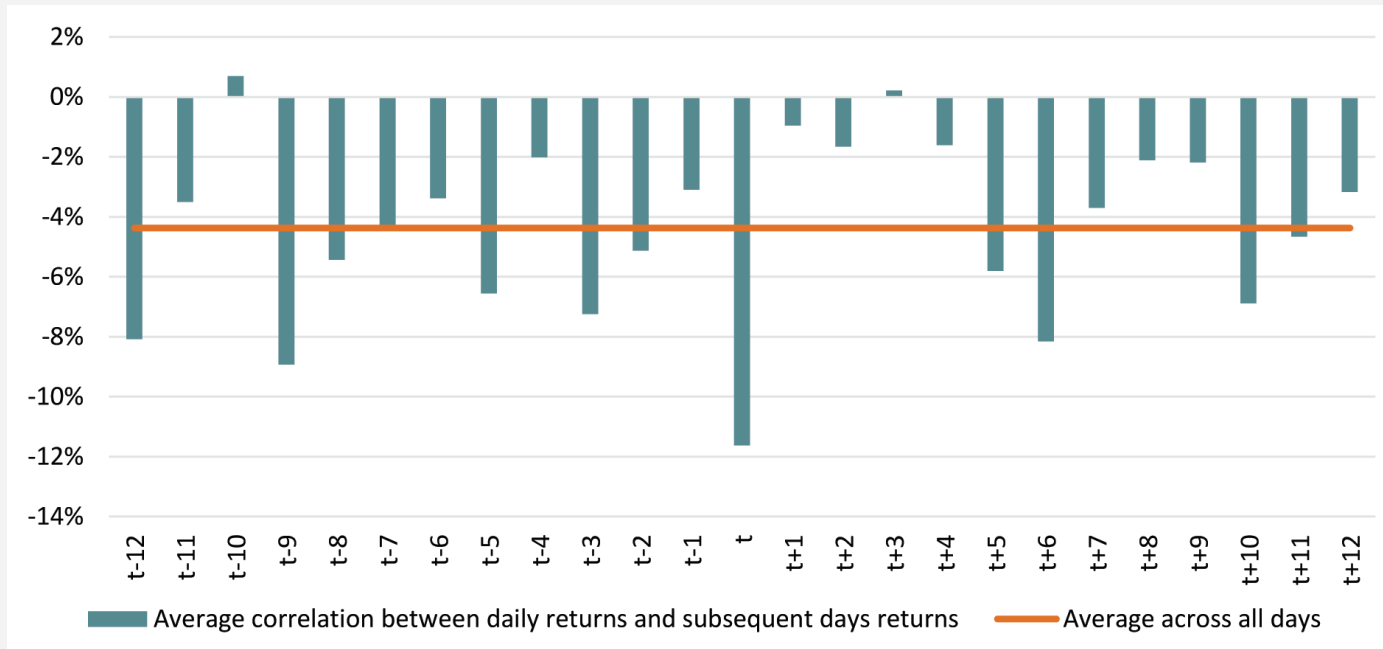


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## Do month end moves tend to reverse the next day?

If some part of the share price moves into the month-end close is due to manipulation, one would expect some of the moves to reverse the next trading day. We tested this by measuring the cross-sectional correlation between total returns on a day with the total returns the next day. If this correlation is positive, then there is momentum in relative performance, as yesterday's winners tend to be today's winners. If the correlation is negative there is reversal, as yesterday's winners tend to be today's losers.

The chart below shows the average reversal effect for each day of the month, measured as the correlation between the total returns on a day and total returns on the next trading day.





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Our analysis shows that on average daily share price moves tend to reverse, with a very weak correlation between daily returns of about 4% on average. However, on the first trading day of the month this reversal is markedly stronger and this effect is more pronounced on this day than any other during the month. Relative share price moves on the last day of the month are more likely to reverse the next day than any other trading day in the month.

### Conclusion

We have performed three simple tests to check if behaviour consistent with month-end window dressing is observable on the JSE. Our analysis shows that on the last trading of the month you will tend to see:

- Higher share price returns than other days
- A stronger closing auction than any other days
- Share price moves that have a stronger than average tendency to reverse over the next trading day

While each of these tests exhibits behaviour that is consistent with the existence of month-end window dressing, none of these tests can prove the existence of window dressing. We will leave that to the appropriate regulators to do on a case by case basis, but perhaps this note can give some solace to the next fund manager who is expecting to produce a month of benchmark beating performance only to give up their alpha on the last day of the month.

### Disclaimer

Nothing in this note should be considered investment advice; the effects we observe are too small to exploit after trading costs.

