

# The impact of private placements and capital structure changes on technical analysis

When a company changes its capital structure, there are always consequences. **BEN MARSHALL** considers the implications for users of technical analysis.

**T**echnical analysis or charting involves making investment decisions about traded instruments based on past market data such as prices and volume. Despite being largely dismissed by academics, technical analysis has a significant following in the investment community.

When the key words “technical analysis” are typed into the Internet search engine Google, 326,000 URLs are located - compared to 49,000 URLs for “portfolio theory”.

The vast majority of prior research on technical analysis has focused on testing the profits accruing to technical trading strategies, while a smaller strand of literature has considered the theoretical justification for technical analysis. As yet, no research has considered the implications of potentially important price changes stemming from company capital structure changes.

This research seeks to fill the void by considering the implications of private placements for users of technical analysis. The incorrect choice of adjusted or unadjusted data is shown to have the potential to cause invalid signals for technical analysts. With adjusted data, historical data prior to a capital structure change is adjusted for the change to aid comparison across time. This adjustment is not made in unadjusted data.

## *Technical analysis background*

Technical analysts have long asserted that their predictions work because orders are clustered. This results in support and resistance. Support is a level or area on the chart under the market, where buying interest is sufficiently strong to overcome selling pressure. As a result, a decline is halted and prices turn back.

Resistance is the opposite of support (Murphy, 1986, p. 59). Once resistance (support) is penetrated, prices often form an uptrend (downtrend) which is defined as a succession of higher (lower) highs and higher (lower) lows. These lows (highs) can be connected to form a trendline.

Tests of the profitability of technical analysis have centred around metric-based trading rules such as buying (selling) when price moves above a moving average of past prices. Such rules lend themselves to testing because they are easily defined.

While harder to define, rules based on support and resistance have also been tested. These typically define resistance (support) being broken when price moves above (below) a local maximum (minimum). The security is bought (sold short) when resistance (support) is broken. Most studies (e.g. Bessimbinder and Chan (1998)) have found positive gross profits equal to or less than the transactions costs an average investor would face when implementing these rules. In other

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words, it appears that excess profits cannot be made from these rules.

Technical analysis articles do not typically mention whether they use adjusted or unadjusted data. As we shall shortly see, this can have a big impact on the signals generated by technical analysis techniques.

### **Technical analysis and private placements**

Data is a critical part of technical analysis. Small scale users of technical analysis tend to purchase 5-10 years history of each share in the market(s) they wish to follow in open, high, low, close, volume format from a data provider, and then purchase the right to download the latest data on a daily basis. Technical analysis software such as Metastock is purchased to chart the data.

Bigger users of technical analysis are more likely to purchase a terminal from Reuters or Bloomberg. As well as giving them access to data history and updated data on an intraday basis, such terminals also have technical analysis charting capabilities.

In markets that operate a trading floor, the data journey from transaction to end user begins with an exchange employee - a pit reporter - who watches the action in the pit and types the bids, offers and trades into the exchange computer. The exchange computer then passes this on to real-time data providers who re-format it and send it to users of tick-by-tick data.

Most end-of-day vendors get their raw prices from these real-time vendors, not directly from the exchange itself. The journey for data from screen-based exchanges is the same except that data is entered into the exchange computer electronically rather than manually.

As well as ensuring that adequate processes are in place to ensure data integrity, data providers are faced with an important decision on how they will handle capital structure changes. There appear to be three approaches:

1. The data provider adjusts its history data and notifies customers of the capital structure change so they can download the adjusted data;
2. The data provider notifies customers of capital structure changes and lets

customers manually adjust their data themselves;

3. The data provider requires customers to keep track of capital changes and then make their own adjustments.

The decision regarding the adjustment of data from a technical analysis point of view following an event such as a share split is straightforward, and is well documented by technical analysis books such as Magee and Edwards (1997). If there has been a 2:1 split in share XYZ on day  $t$  and the price at  $t-1$  was \$10, then the price on day  $t$  can be expected to fall to  $\$5 + a$  (where  $a$  is the value of any signalling effects which exist in reality – see Fama, Fisher, Jensen and Roll (1969), but will be ignored for the purposes of this example).

In this case, all history data should be halved to reflect the fact that holders of XYZ at day  $t$  now have twice as many shares, each at half the price, compared to day  $t-1$  and before. This also suits those who purchase shares on day  $t$  and after as they are purchasing a share which has half the claim on the company assets that it had prior to day  $t$ .

The implications of private placements for technical analysts are less obvious. Private placements of equity involve a firm raising new capital by placing a new parcel of shares with one or more current or new shareholders.

In the US, firms can offer restricted or unrestricted shares. Restricted shares constrain the buyer to a minimum legal holding period of two years or three years if they have a controlling relationship with the firm. Unrestricted shares do not have this constraint. Private placements in other countries, such as Australia, do not typically have any resale restrictions.

The significance of differences in data that has and has not been adjusted for private placements – from a technical trading rule perspective – is dependent on the unique characteristics of each share's recent price movements and the size of the difference between adjusted and unadjusted data. The greater the difference between adjusted and unadjusted data, the greater the likelihood of divergent signals being

given to the technical analyst. The size of this difference is an increasing function of the placement discount and the proportion of shares placed, and a decreasing function of the size of the positive announcement effect of the placement.

One approach to quantifying the impact of private placements on technical trading signals is simply conducting a case study on a stock that has undergone a private placement. However, this approach can be criticised as focusing on a private placement that is abnormal.

Therefore, this paper is based around the average characteristics of US private placements as documented by Hertz and Smith (1993), the seminal work in this area. These characteristics are less than the maximum permissible for ASX listed stocks so the results are equally applicable to ASX placements.

Hertz and Smith (1993) found that the average placement size in their US sample was 15.9% of post placement shares outstanding. In addition, they found the average discount to be 15.6% of the pre-placement share price. I am not aware of research on the average characteristics of placements in Australia but the ASX listing rules provide the maximum permissible proportion of shares placed and discounts without shareholder approval.

Rule 7.1 states that a maximum of 15% of the shares on offer prior to a placement can be made in a placement. This equates to 17.6% of post placement shares outstanding, the more common convention for expressing placements sizes in the US. Rule 7.3.3 states that "the issue of securities must be at a price of at least 80% of the average market price for securities. The average is calculated over the last 5 days on which sales in the security are recorded" (Australian Stock Exchange Online, 2004).

Hertz and Smith (1993) found evidence of a positive abnormal return of 1.7% on average following the announcement of a private placement. This was after an allowance had been made for the decline following the dilution effect of issuing shares at a discount (it is rare for placement shares to be offered at a premium). Thus, the

net effect of a private placement is typically a wealth transfer from existing shareholders to those new shareholders who receive shares in the private placement.

Some companies will undertake relatively small placements at relatively small discounts and experience relatively large positive announcement effects. This will result in small differences between adjusted and unadjusted data which means that there might not be different signals given to the technical analyst.

However, as Table I illustrates, there are also placements that result in much larger variations between adjusted and unadjusted data than those used in this study. The larger the variation, the greater the potential for different technical analysis signals. Hertz and Smith (1993) and Wruck (1989) both considered placements of US firms.

This paper is based around the average size of the placement discount and average proportion of shares placed variables in the US study of Hertz and Smith (HS) (1993). Their findings were not extreme. Wruck (1989) found

maximum placement discounts and maximum proportion of shares placed in the US substantially in excess of these. The maximums allowed on the ASX without shareholder approval are also in excess of these. The placement discount is calculated by comparing the placement share price to the share price one day before the placement announcement. This maximum proportion of shares placed is measured as Shares Offered / (Shares Offered + Shares Already Outstanding).

Consider a hypothetical private placement of unrestricted shares that incorporates the results of Hertz and Smith (1993) using price data that came from a listed company. I will refer to this company as "XYZ". On 8 June 2002 company XYZ, which had 100m shares on issue at a closing price of \$3.50, announced a private placement of 19m (15.9% of post placement shares outstanding) new shares at \$2.95 (a 15.6% discount).

We can work out the theoretical price following the private placement (excluding announcement effects) as follows:

$$\text{Post Placement Share Price (excl. ann. effects)} = \frac{(\text{SoI PP} \times \text{PP SP}) + (\text{SiP} + \text{P SP})}{(\text{SoI PP} + \text{SiP})} \quad (1)$$

Where:  
 SoI PP = The Number of Shares on Issue Prior to Placement  
 PP SP = The Share Price on the day before the Placement announcement<sup>1</sup>  
 SiP = The Number of Shares in the Placement  
 P SP = The Placement Share Price

Applying equation one to company XYZ data results in:

$$\text{Post Placement Share Price (excl. ann. effects)} = \frac{(100\text{m} \times \$3.50) + (19\text{m} \times \$2.95)}{(100\text{m} + 19\text{m})}$$

$$\text{Post Placement Share Price (excl. ann. effects)} = \$3.41$$

Consistent with Hertz and Smith (1993), this article assumes that the market viewed the private placement in a positive fashion which resulted in a 1.7% increase in the share price (above the theoretical post placement price) after the announcement.

$$\text{Post Placement Share Price} = \text{Post Placement Share Price (excl. ann. effects)} + \text{Ann. Effects} \quad (2)$$

For company XYZ the Post Placement Share Price is:

$$\text{Post Placement Share Price} = \$3.41 + \$3.41 \times 1.7\%$$

$$\text{Post Placement Share Price} = \$3.47$$

The effect of the private placement can be left in the XYZ share price data (unadjusted data) or removed from the data (adjusted data) by scaling all pre placement share prices as follows:

$$\text{Adjusted Price} = \frac{(\text{SoI PP} \times \text{PPSP}) + (\text{SiP} + \text{P SP})}{(\text{SoI PP} + \text{SiP})} \quad (3)$$

$$\text{Adjusted Price} = \frac{(100\text{m} \times \text{PP SP}) + (19\text{m} \times \$2.95)}{(100\text{m} + 19\text{m})}$$

The unadjusted and adjusted charts

TABLE I: PRIVATE PLACEMENT CHARACTERISTICS

	HS (1993) (Mean)	Wruck (1989) (Max)	ASX Listing Rules (Max)
Placement Discount (Unrestricted Placements)	16%	52%	20%
Proportion of Shares Placed (All Placements)	16%	80%	18%

FIGURE 1: UNADJUSTED DATA



FIGURE 2: ADJUSTED DATA



of company XYZ are shown in Figures 1 and 2.

Figure 1 depicts the unadjusted price data of company XYZ before and after a private placement that incorporates the seminal results of Hertz and Smith (1993). The unadjusted share price data falls below the trendline, horizontal support and the 100 day moving average (black line). This leads to a sell signal being generated for a technical analyst who is basing his/her decisions on either of these indicators.

Figure 2 depicts the adjusted price data of company XYZ before and after a private placement that incorporates the seminal results of Hertz and Smith (1993). The adjusted share price data remains above the trendline, horizontal support and the 100 day moving average (black line). This leads to no sell signal being generated for a technical analyst who is basing his/her decisions on either of these indicators.

Figures 1 and 2 show that proponents of technical analysis will receive quite different signals following the private placement depending on whether they use unadjusted or adjusted data. The chart of unadjusted data provides a clear sell signal to those following a graphical system based around trendlines or support and resistance, and a metric system that involves selling when price closes below a 100 day moving average. No sell signal is given by either of these techniques in the chart of the unadjusted data.

Given the potential for adjusted and unadjusted data to give the technical analyst different signals, the question of whether adjusted or unadjusted data should be used needs to be asked. I will consider this question at a time following the placement of the new shares, firstly from the point of view of existing shareholders (those who held the shares prior to the announcement of the private placement) and secondly from those looking to purchase the shares.

The share price drop on the 8 June 2002 represented a transfer in wealth from existing shareholders to those who received shares in the placement. This can be defined as follows:

$$\text{Wealth Transfer From Existing Shareholders} = \text{Pre Placement Share Price} - \text{Post Placement Share Price} \quad (4)$$

For company XYZ the Wealth Transfer From Existing Shareholders is: \$3.50 – \$3.47 or \$0.03 per share

Each share held by existing shareholders is worth \$0.03 less following the placement, because wealth has been transferred to those who received the placement shares issued at a discount. Existing shareholders who use technical analysis would require data which incorporates this drop so they would therefore require unadjusted data. This would give them a sell signal.

Someone looking to purchase shares following the placement is effectively buying a mixture of the “new” shares (those issued in the placement) and “old” shares (those already on issue prior to the placement).

On 8 June 2002 the old shares’ spike down in value (from \$3.50 to \$3.47) was exactly matched by the new shares’ spike up in value (from \$2.95 to \$3.47). The placement is therefore neutral for someone looking to purchase the shares, making adjusted data, which has removed the drop in share price, the most appropriate.

There are several implications of this analysis for investors who use technical analysis to make investment decisions and for academics who study the profitability of technical analysis. Investors should firstly be aware of whether their data vendor is providing adjusted or unadjusted data. A data vendor will only provide one or the other, not a combination of the two, so investors should track private placement announcements to enable them to incorporate their impact into their decisions.

Investors who hold shares prior to the placement should base their technical analysis on unadjusted data as this will correctly reflect the transfer of wealth from themselves to those who received shares in the placement. Alternatively, investors looking to purchase shares following a placement should use adjusted data. The adjusted data removes the drop in price following the placement which is not relevant for them since they are looking at purchasing a mixture of new and old shares.

There are also implications for academic researchers. Any thorough treatment would use adjusted data to provide entry signals and unadjusted data to provide exit signals.

**Conclusions**

This paper has shown that private placements have the potential to cause invalid signals for technical analysts. This leaves users of technical analysis and academic researchers who are studying technical analysis with the important decision of whether to use adjusted or unadjusted data in their charts.

The first step in this decision-making

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process is to be clear on whether the data source is one of adjusted or unadjusted data. Once this is established, investors should adopt the following rule. If you own a share you should use unadjusted data. If you are watching a share with a view to purchasing it, you should use adjusted data. Academic researchers should also use both adjusted and unadjusted data - depending on whether they are holding a share or looking to purchase it.

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### NOTES

1 I assume that the announcement occurred on the same day that the shares were placed.

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