EARNINGS PER SHARE, ADJUSTED FOR NEW ISSUES.

By: J. R. Harris, M.A., F.F.A.

Most analysts have recognised the earnings per share trend as an investment tool of some value — and in calculating the trend most also have made allowance for the dilutional factor of issues to shareholders affording them some capital benefit. The common approach to this adjustment is to assume sale of sufficient rights to take up new shares without further capital outlay. Our author, an experienced practical analyst, and Actuary to the Bank of N.S.W., effectively takes issue with complacent acceptance of this approach and stimulates interest in alternatives.

To assess the value of a share the analyst must make some estimate of the income he can hope to receive from the investment in future, unless he has in mind only a short-term speculation. As one step in making this estimate he can examine how the company's earnings for its shareholders have varied in the past. When a company has made no issues of new capital the examination is simple; whether the company's net profit or profit per share is used will not matter as the sequence will be the same in either case and will show a true picture of the company's performance on behalf of its shareholders. If there have been take-over issues, or other issues to outsiders for cash or assets, the trend of the company's net profit could be misleading. The profit could increase every year, but the portion for the shareholder who held the shares from the beginning of the period might decrease each year.

In this case a truer picture would be given by the trend of the profit per share without adjustment. If, on the other hand, a company has made only bonus issues during the period, the trend of profit per share without adjustment would be misleading, and the company's total net profit would show the true picture. When there have been cash issues at par or at small premiums, neither the total profits nor the unadjusted profit per share will give a true picture of the company's profitability for its shareholders.

Method of Making the Adjustment.

In recent years several stockbrokers and others have circulated figures of profit per share adjusted for new issues. The basis on which the figures have been calculated has been generally:

(i) Work profit per share.
(ii) If there is a bonus issue of one for n, multiply profit per share in every year before the bonus issue by the fraction n/(n + 1).
(iii) If there is an issue to shareholders for cash, calculate the bonus element of this issue and adjust as in (ii).

The main points giving trouble under (i) are whether the figure should be worked on average capital and how to allow for different types of equity, such as convertible notes, options and deferred shares. These are both important points, but will not be discussed in this article.

To (ii) there can be no objection. If a shareholder had n shares before the issue, he would have (n + 1) after it, so that the profit for n shares before the bonus issue
should be compared with the profit for \((n + 1)\) shares after it. This comparison can be made equally well by multiplying profit per share as worked in (i) either by \(\frac{n}{n+1}\) in each year before the bonus issue or by \(\frac{n}{n+1}\) in each year after it.

It is the practice used in calculating step (iii) which gives me the most doubts and which I wish to discuss here.

Sell Enough Rights to Take Up Remainder.

The usual way of determining the bonus element of a cash issue is to suppose that a shareholder sells enough of his rights to take up the remainder.

Let there be a new issue of shares in the ratio one for \(n\) at \(k\) per share.

Let the price of shares cum rights by \(P\).

The equivalent ex-rights price

\[
p = \frac{nP + k}{n + 1}
\]

and the equivalent rights price

\[
r = \frac{n}{n + 1} (P - k)
\]

If a shareholder originally held \(Nn\) shares, he will have \(N\) rights. Suppose he takes up \(\frac{rN}{k + r}\) of them and sells the remainder at the theoretical price.

<table>
<thead>
<tr>
<th>Number sold</th>
<th>(N - \frac{rN}{k + r})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceeds of sale</td>
<td>(\frac{kN}{k + r})</td>
</tr>
<tr>
<td>Cost of taking up rights</td>
<td>(\frac{rN}{k + r} \times k)</td>
</tr>
</tbody>
</table>

The shareholder started with \(Nn\) shares and took up \(x\) shares with the proceeds of sale of rights, so the bonus element is

\[
x = \frac{r}{n(k + r)} = \frac{r}{np}
\]

and to adjust earnings per share for this bonus element, earnings per share before the issue are multiplied by the factor:

\[
\frac{np}{np + r} = \frac{np}{n^2P} = \frac{p}{P}
\]

When a bonus issue of one for \(n\) is made, earnings per share is adjusted by the factor \(\frac{n}{n+1}\). This factor could be expressed as the ex-bonus price, divided by the equivalent cum-bonus price. The factor obtained above for a cash issue, ex-rights price divided by the equivalent cum-rights price, is obviously consistent with the factor for a bonus issue. On the other hand, if an issue was made at market price, the equivalent cum-rights and ex-rights prices would be equal and no adjustment would be needed. The adjustment \(\frac{p}{P}\) is consistent with the adjustments used for bonus issues or issues at market price, and so at first it may seem reasonable to use it even though its derivation is based on the somewhat artificial assumption that rights are sold to take up the remaining ones.

One objection to this adjustment is that in the form stated, it is not a unique figure. So far the only restrictions placed on \(p\) & \(P\) is that they must be equivalent cum- & ex-rights prices. Whether \(P\) is an actual cum-rights price and \(p\) the equivalent ex-rights one, or \(p\) an actual ex-rights price and \(P\) the equivalent cum-rights one or both are equivalents of an actual rights price does not affect the reasoning by which the adjustment was derived, but it may affect considerably the amount of the adjustment. No-one can prove that any of these methods of making the calculation is any better than another, and to this extent the adjustment depends on a subjective choice of the analyst. Often this will not matter much, but in some issues, for example the last G. J. Coles issues, the variation of prices during the course of the issue must mean that the method chosen by a particular analyst will make quite a difference to the amount of the adjustment.

Another objection can be found if we investigate what the company must earn on
Earnings per share:

its new money to justify the assumptions. Let the company's total earnings be \( E \) and earnings per share, unadjusted, before the issue be \( e \). The terms of the issue are as before.

Adjusted earnings per share = \( \frac{P}{p} \times e \). Our task is to find what the company must earn on its new money to continue earning at the rate \( \frac{P}{p} e \) per share after the issue.

Its total earnings must increase to \( \frac{n + 1}{n} \times \frac{P}{p} E \)

Earnings on new money = \( E \left\{ \frac{n + 1}{n} \times \frac{P}{p} - 1 \right\} \)

= \( \frac{E}{nP} \times \left( (n + 1) p - nP \right) \)

= \( \frac{E}{nP} \times k \)

= \( \frac{k}{n} \times \frac{E}{e} \times \frac{e}{P} \)

= New money \( \times \) Earnings Yield before Issue.

This conclusion means that when we use the adjustment \( \frac{P}{p} \) to adjust earnings per share after a cash issue, we are assuming that the rate the company should earn on its new money is the current earnings yield on its shares. Although this assumption may be convenient - among other things it means that the earnings yield on a share at the theoretical ex-rights price is the same as the earnings yield on the equivalent cum-rights - it is really quite absurd. The earnings yield of a share is a figure that varies inversely with the market price and is subject to influences that have no relation to the earning power of the company.

This point highlights the fact that this method of adjusting earnings per share is a hybrid. If a company has made no cash issues, the analyst is able to study the sequence of its earnings per share and the market performance of its shares, two separate records. When the company has made cash issues and adjustments are made based on market prices, then the two records have been mixed and depend on each other.

As an example we might consider a company which had capital of £2,000,000 in 20/- shares and then made three successive issues of one for two at par, one for three at par, one for four at par at the beginning of each of the next three years. We will suppose that the company earned £400,000 in the year before the first issue and increased its profit by £100,000 in each of the next three years.

We will consider two cases: -

(a) the market values the shares at 20 times earnings, and
(b) the market values the shares at 10 times earnings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Earnings (£000)</th>
<th>Number of shares (Million)</th>
<th>Earnings per share, No adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>400</td>
<td>2</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>500</td>
<td>3</td>
<td>167</td>
</tr>
<tr>
<td>3</td>
<td>600</td>
<td>4</td>
<td>150</td>
</tr>
<tr>
<td>4</td>
<td>700</td>
<td>5</td>
<td>140</td>
</tr>
</tbody>
</table>

Year | Earnings per share before issue | Case (a) | Case (b) |
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adj. earnings per share</td>
<td>Adj. earnings per share</td>
<td>Adj. earnings per share</td>
</tr>
<tr>
<td></td>
<td>( p )</td>
<td>( p )</td>
<td>( p / P )</td>
</tr>
<tr>
<td>1</td>
<td>200</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>167</td>
<td>3.1/3</td>
<td>2.3/4</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>3</td>
<td>2.3/5</td>
</tr>
<tr>
<td>4</td>
<td>140</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In case (a) by valuing the company's shares as a good growth stock, the market causes the adjusted earnings per share to resemble those of a good growth stock; in case (b)
Earnings per share: by valuing the share as a pedestrian stock, the market makes the adjusted earnings per share appear pedestrian.

A Method Based on Asset Backing.

It is possible to adjust earnings per share with a factor based on asset backing instead of market price. Continuing with the example used before, we will assume that the asset backing of the share at the last balance sheet is \( A \) before the issue, and \( a \) after the issue and after adjusting for new cash.

\[
\frac{(n+1)}{n} = \frac{A + k}{a}
\]

By analogy with the earlier argument, the adjustment in this case would be \( \frac{A}{a} \). This factor is at once seen to be consistent with the method of adjusting for bonus issues and also for new issues at asset backing with no rights.

Such a method does not have the superficial realism as has the previous method, where sufficient rights are sold to take up the remainder. There would also be a difference in the earnings yield on the cum-rights price and the equivalent ex-rights price. However, it has the advantage of being based on a figure which does not confuse the company's own performance with its shares' market performance and is less subject to the whim of the analyst than is a method based on market prices.

Another point in favour of the method is that to maintain its earnings per share after the issue the company must earn on its new money at the same rate as it was earning on its shareholders' funds before the issue. This criterion seems more sensible than that of the method based on market. It would seem a more sensible criterion still if we could rely on the published figures of asset backing. As it is, some companies re-value, others do not, others write down heavily, others too little, so that one is averse to relying much on asset backing in any analysis.

However, even if one could obtain reliable and consistent figures of asset backing, there is a more serious objection to the method. To illustrate it let us suppose that company X has no reserves, earns seven percent on its capital and pays it all out as dividend. It makes a new issue at par, earns seven percent on the new money and pays it all out as dividend. There is obviously no growth in this company's shares and one would be better to invest in B.H.P. debentures. Now consider company Y, also with no reserves and paying out all its earnings, but earning at 14 percent on capital and new money. If this company regularly made new issues, and continued to earn 14 per cent on the new money, it would surely be a growth stock. Yet, if adjusted earnings per share were calculated by a method based on asset backing, both companies would appear to have experienced no growth in earnings per share.

Method Based on Standard Earning Rate on New Money.

It is simple enough to develop an adjustment based on the assumption that new money should earn at a standard rate. If the standard rate is \( i \), the adjustment will be of the form:

\[
\frac{n + e}{n + 1}
\]

using the same notation of the previous examples. This adjustment is obviously consistent with the adjustment for bonus issues, but is not consistent for issues at market price unless the earnings yield of the share and the standard rate conveniently coincide.

The main objection to such a method is in my opinion that the selection of the standard rate would be arbitrary and subjective. The difficulties in selecting the rate would be great: should the same rate be used for every company? should the same rate be used for every year? Consequently, the variation between analysts would be considerable. If the method based on market values is objectionable because it mixes the company's performance with its shares' performances, surely a method which mixes the company's performance with an analyst's whim is more so.

Adjustments When Issues are Made between Balance Dates.

When a cash issue is made not at balance date, but at some date between, an adjustment is needed not to the factor for adjusting part earnings per share, but to the calculation of earnings per share in the year of issue. This adjustment can be an important cause of variation between analysts and needs some comment.

A method commonly used is to work the ratio of earnings to average capital, which is generally based on the amount of the dividend actually paid. There is no justific-
Earnings per share:

Action for this method, particularly when a bonus issue has been made. After a bonus issue of one for \( n \) a shareholder will hold \( (n + 1) \) shares for every \( n \) he held previously, so that the earnings of \( n \) shares before the issue must be compared with the earnings of \( (n + 1) \) shares after it. This reasoning applies whether the issue takes place immediately before balance date, immediately after it, or during the year.

When a cash issue has been made, it is equally wrong to use the ratio of earnings to average capital. A better method would be to work the bonus element of the cash issue and to regard that part as capital from the beginning of the year and to regard the remainder as capital in force from the date when the cash was subscribed. This course would be consistent with the adjustment made to earnings per share in previous years.

The following example illustrates the method and its justification. In this example the method of adjusting earnings per share for new issues is based on market price, but another method would produce a similar result.

Company balance on June 30 Capital £700,000.
Issue one for two at par payable in full on March 30.
Cum-rights price of 20/- shares was 32/-
Equivalent ex-rights price is 28/- and rights value 8/-

\[ \text{'Bonus element of issue is} \quad \frac{8/-}{2 \times 28/-} = \frac{1}{7} \]

The new capital of £350,000 can be regarded as
Bonus Capital of 1/7 £700,000 = £100,000
& Cash Capital of £250,000 available for 3 months £350,000

Capital at beginning of year = £700,000
Bonus capital = £100,000
3 months of £250,000 cash capital = £ 62,500

\[ \text{Adjusted Capital} = \frac{£862,500}{7} \]

The assumption implicit in using an adjustment based on market price is that we expect the company to earn on new money at the same rate as the earnings yield the market puts on its shares.

Let us suppose that this company's earnings yield was 10 per cent before the issue. Its earning rate on capital would be 16 per cent, so that the previous years earnings must have been 16 per cent of £700,000, i.e. £112,000. The new money was £350,000 for three months and this must earn 10 per cent, i.e. \( \frac{1}{9} \) of £35,000 = £8,750.

The earnings during the year in which the issue took place must, therefore, be £112,000 + £8,750 = £120,750.

\[ \text{Ratio of earnings to adjusted capital} = \frac{120,750}{862,500} = 14\% \]

Adjusted earnings per share during the previous year = 16\% \times \frac{28/-}{32/-} = 14\%

This way of dealing with an issue between balance dates is thus consistent with the method used to adjust earnings per share for issues on balance dates.

Conclusion:

There is no really satisfactory method of adjusting earnings per share for new issues and it would be dangerous to put too much reliance on the trend of adjusted earnings as
Earnings per share: a measurement of a growth stock. However, the trend does have some use in indicating stocks worth further investigation.

Of the methods available, the methods based on market value for adjusting earnings per share are unsatisfactory for three main reasons:

(a) They are subjective.

(b) They involve the assumption that the company should earn on new money at the same rate as its shares' earnings yield.

(c) They are hybrid.

Nevertheless, these methods seem to be less objectionable than any others.

Quarrying and Allied Industries

Quarries may comprise :-
1. Fixed plant
2. Contract plant
3. Mobile plant

Plant required for quarrying and crushing would include :- Primary crusher, secondary crusher, conveyors, drills, dump trucks, compressors, bulldozer, screens, bins, loaders.

Plant and equipment cost for achieving output of 200 tons a day would be about £70,000; 400 tons about £120,000.

Cost of establishing a ready mixed concrete operation is much lower. A 200 yards a day operation would cost between £20,000 and £30,000.

Quarrying is, however, difficult with low output. A small operator in the quarry industry, that is, one on an output of, say, 200 tons might aim for a 6/- a ton profit, about £14,000 a year. From this would be deducted some £7,000 depreciation and £2,500 taxation to leave a net £4,500. As stated previously plant cost would be £70,000 while working capital requirements would be a minimum of £10,000 or so.

A small man wishing to break into the quarrying industry in the metropolitan area would, I consider, have to be content with let us say 50-100 tons of sales a day. He would have to be prepared to put up his own ready mixed concrete out lay and, if necessary he would have to organise his sales from the ready mixed concrete organisation.

Competition in the quarrying industry is strong and quarries close to customer have decided advantage. Cartage is approximately 6d. per ton per mile.

Australian Blue Metal Ltd. operates a quarry 32 miles from the Sydney G.P.O. while Blue Metal Industries at Prospect is 23 miles away from the G.P.O. Any new competitor further out from Sydney obviously would be at considerable disadvantage.

In Sydney, blue metal is sold at prices ranging from 25/- to 33/- per ton. Bulk buying sometimes would be at slightly lower figures.

EDITOR'S NOTE ... This is not a full coverage of Mr. Driscoll's address. Some of his remarks were for the information of those present only and were not intended for publication.