

THE INVESTMENT IMPLICATIONS OF INCREASED BROKERAGE RATES

A Theoretical Approach

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1. INTRODUCTION

On August 6, 1975, the Members of the Associated Australian Stock Exchanges voted to increase brokerage rates. The new scales are effective from September 1, 1975. For considerations below \$5,000 the commission rate rises by 0.5%. It is not the purpose of this note to canvas the merits or otherwise of the rates, nor to discuss some of the innovations such as halved brokerage on orders reversed within one month, or brokerage on application money. Rather the intention of the writer is to suggest a theoretical approach, in terms of fundamental analysis, to the effects of changes in brokerage rates on share values.

Readers who have not used algebraic terms since school days should not be deterred by the formulae. The text explains the analysis in a way which ought to be understandable to those who are not mathematically inclined.

It is emphasised that this approach is advanced tentatively in order to stimulate discussion, and, indeed, in the hope that the assumptions on which it is based, and its conclusions, are in error.

2. SHARES AS A KIND OF PERPETUITY?

It would seem reasonable to think of an ordinary share as a kind of perpetuity. A perpetuity might be regarded as a bond which is never repaid but provides an everlasting stream of equal periodical payments. The present value, P of a perpetuity is given by the expression

$$P = \frac{R}{r}$$

Where R is the annual payment and r the desired rate of return. It can be seen that the value of the perpetuity will vary inversely with the desired rate of return. If the desired rate rises from 10% to 11% the new price will be 10/11 of the former.

Whereas the annual payment, R is constant in the case of a perpetuity, the return from a share is uncertain and consists of a dividend which is generally expected to grow.

3. SHARE VALUES INCLUDE DIVIDEND & GROWTH EXPECTATIONS

Investors hope that the prospective dividends and/or earnings growth will result in a higher share price. In short, investors buy shares so as to enjoy increasing dividends and/or sell the shares at a higher price at some time in the future. That there is an expectation of capital growth is demonstrated by dividend yields being lower than the bond rate, despite the greater uncertainty attaching to the equity security.

4. THE INVESTMENT HORIZON

It seems to the writer that especially in recent years equity investors are not much interested in estimates of earnings and dividends for distant years. They wish to be

convinced of the probability of a gain over the next year or so, at which time they will re-assess the situation. This is not to say that investors do in fact hold shares for only a year, but that they buy them as if they were going to hold them for that period. If that is the case, transaction charges become very significant indeed.

5. ALLOWING FOR TRANSACTION CHARGES WHEN EVALUATING PROSPECTIVE RETURNS

If one leaves aside the question of tax, which varies from investor to investor, it might be reasonable to assume that "most investors" or "the average investor" has a one year investment horizon, and a desired rate of return, r, on an investment P. r encompasses both dividend and capital growth, and is net of transaction charges. If the transaction charge including stamp duty etc., is at rate, b, on both buying and selling considerations and the total expected annual rate of return on an investment is, i, before charges, then

$$r = \frac{P(1+i)(1-b) - P(1+b)}{P(1+b)} \quad (2)$$

here $P(1+b)$ = the cost of investment after brokerage, and $P(1+i)(1-b)$ = the net proceeds on realisation after one year during which the investment of P has yielded a total return at rate i. The top line of equation (2) represents the gain after brokerage on the investment which when divided by the total cost of the investment provides the desired rate of return, r.

Equation (2) can be reduced to

$$r = \frac{(1+i)(1-b)}{1+b} - 1 \quad (3)$$

A more useful form of equation (3) is one showing the total return on an investment, i, which must be achieved before charges if the investor is to receive a desired rate of return, r, after charges.

$$r = \frac{(1+i)(1-b)}{(1+b)} - 1 \quad (3)$$

$$(r+1)(1+b) = (1+i)(1-b)$$

$$\frac{(1+r)(1+b)}{(1-b)} = 1+i$$

$$i = \frac{(1+r)(1+b)}{1-b} - 1 \quad (4)$$

For example, if an investor's desired rate of return is 0.15 (15%) and the transaction rate is 0.023 (2.3%) the required gross return on a given investment, i, must be

$$i = \frac{(1.15)(1.023)}{0.977} - 1$$

$$= 0.204 \quad \text{i.e. 20.4\%}$$

This means that if an investor is just willing to purchase a share at \$1.00, he is expecting it to generate a total gain of 20.4 cents which will be reduced to 15.345 cents after charges. This will yield 15% on his outlay of \$1.023 cents per share.

6. IMPLICATIONS OF THE MODEL

The model implies that in contemplating a sale one year hence the investor assumes that there will be a buyer, like himself, who will be willing to purchase the share at \$1.204, presumably in contemplation of a similar gain, and so on, ad infinitum.*

If transaction costs rise, the investor faced with a share, the characteristics of which are unchanged by the transaction charges, can only attain his desired rate of return if the share price drops. At first sight one might expect a price fall roughly equivalent to two transaction charges to be sufficient to again make the share price attractive.

However the increased transaction charges are also faced by the presumed future investors, who would find the shares sufficiently attractive only at a lower share price. Because of this an intending investor cannot allow for, say, a 0.5% rise in brokerage merely by looking for an extra 1% total yield. He must allow each intending investor in the future to get another 1% out of the share during the period for which he holds it. In this case we are assuming that share buyers have a one year horizon, and presume that other investors hold the same view.

We now apply an extra 0.5% brokerage into formula (4). Let b rise from 0.023 to 0.028, then

$$i = \frac{(1.15)(1.028)}{0.972} - 1$$

$$= 0.216$$

If a share purchased at \$1.00 was expected to provide a total yield before charges at a rate of 20.4%, and now is required to yield 21.6%, not only for Investor A but also for B, C, D, etc, then the price must be discounted by a factor of

$$\frac{20.4}{21.6} = 0.944$$

That is, the share price must fall to 94.4 cents before the investor is willing to buy it.

7. ADJUSTMENTS TO ALLOW FOR OTHER INVESTMENT HORIZONS

Particularly after examining that rather ominous outcome, readers may not accept the assumptions underlying the analysis. It might be argued that as the total value of transactions on Australian Exchanges suggests that shares are held on average for twelve years (or some such length of time), the average investor will seek to amortise the transaction charges over that period. It is suggested, in answer to this contention, that share prices are unaffected by those who are presently holding shares long term. It would seem to be more likely that they are dependent on the current evaluations of potential and actual current purchasers, who, even if they intend to be, or turn out to be, long term investors, have a short term horizon when they act.

However, the reader may believe that the investment horizon is longer than the postulated one year. Formula (4) can be modified by allowing the total yield to accumulate for a number of years, n , in this case,

$$i = \sqrt[n]{\frac{(1+r)^n(1+b)}{1-b}} - 1 \quad (5)$$

For example, if it is believed that investors buy for a three year period, the desired annual rate of return is 0.15 and transaction charges are at rate 0.023,

$$i = \sqrt[3]{\frac{1.15^3 \times 1.023}{0.977}} - 1$$

$$= \sqrt[3]{1.592} - 1$$

$$= 0.168$$

If now, the transaction rates rise by 0.5%

$$i = \sqrt[3]{\frac{1.15^3 \times 1.028}{0.972}} - 1$$

$$= \sqrt[3]{1.608} - 1$$

$$= 0.172$$

In this case the share under consideration would have to be discounted by a factor of

$$\frac{168}{172} = 0.976$$

in order to again be just worth buying. The conclusion here then, is that if investors buy on a three year horizon, a 0.5% rise in brokerage charges should cause them to discount shares by about 2.4%.

8. ADJUSTMENTS FOR VARYING DESIRED RATES OF RETURN

The general conclusions of the analysis are little affected by variations in the desired rate of return. In Sections (5) and (6) above, the desired return was postulated as 15%. If it were in fact 20%, the result of raising transaction charges from 2.3% to 2.8% would be to cause the rational investor to require a 4.7% reduction in share price rather than the 5.6% discount calculated at the conclusion of Section (6). A 10% desired rate of return would require a larger discount, 7.1%.

9. DO INVESTORS THINK THIS WAY?

It may be argued as a rebuttal of this analysis that investors don't think this way, and therefore the analysis is unrealistic. Surely there is a parallel here in the activities of the fundamental analyst. He undertakes a deeper study of a company than is generally made by the average investor. He estimates future earnings and other prospects in the light of every relevant economic and political factor that occurs to him. He might apply sophisticated discounted cash flow techniques and finally arrive at an estimate of the intrinsic value of a share. The fact that few investors evaluate shares in this way, or can even understand what he is doing does not invalidate his conclusions. To the extent that his analysis is sound, the share price will tend to move towards his estimate of intrinsic value.

10. CONCLUDING REMARKS & REQUEST FOR COMMENTS

There are, of course other aspects of the investment implications of higher brokerage charges. One could expect it to deter some investors altogether, or perhaps to reduce the number of perceived attractive situations. Perhaps investors will seek shares which seem surer to produce returns over a longer period during which the higher charges can be amortised. Fewer transactions would imply a less liquid market, so that parcels of a given size would be more likely to affect the share price to a greater extent. This would be the equivalent of a further increase in charges. It has been observed that there is generally no compelling reason why shares should be purchased at a given time, whereas there is a continued flow of sales from deceased estates, investors requiring to convert shares to cash etc. Accordingly one might expect higher transaction costs to reduce demand for shares while leaving supply relatively unaffected. Share prices could fall for this reason. The greater proportionate increase in brokerage for small considerations, than for large could also discourage the smaller investor more than it would those who deal in large parcels. This could result in a higher average consideration per transaction. (In Melb-

ourne 1973/74 it was about \$1900 for industrial shares - the examples quoted herein are based on a consideration of about that size).

The writer would be grateful if others would comment on this analysis. It would be useful if one could gain a range of opinions about investors' investment horizons at the time of purchase. One would like to have general agreement on the methodology of the analysis before discussing further the implication of changes in brokerage rates. If the approach adopted here has any validity, the implications are certainly worth further study.

* This is not to say that every investor has the same expectation, or that he believes that the expectations of the investor to whom he will sell will be met. Unless the seller is acting in order to realise needed cash he probably thinks that the person buying when he is selling is mistaken. Nevertheless one must recognise that the buyer to whom one sells hopes for a gain, even if one thinks that he will be disappointed. Similarly while seeking a given rate of return this year, we recognise that in the light of the circumstances prevailing next year both we ourselves and other investors might want a different rate of return.

CONTROL PORTFOLIO INVESTMENT

A comment by

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In the July/August issue you published an article by a gentleman, to whom I will refer as Mr. X.Y.Z. for want of a better name, in which he purports to show the necessity to impose yet one more control on this overcontrolled world. He argues that although we have gained much from overseas portfolio inflow in the past, it is now time to put a stop to it. Seeing that Governments enjoy imposing controls almost as much as some people enjoy drinking beer, I felt it incumbent upon me to investigate the alleged disadvantages of this terrible overseas money plague which seems set to wipe the Australian capitalists (all 15 of us) off the face of this earth. I will therefore attempt to point out the fallacies in the "analysis".

Firstly, it appears to be generally accepted that overseas investors (whom I will henceforth call foreigners for short) "have a very significant impact on price movements". This appears to imply that the Australian stock market is made inefficient by allowing greater participation in the market by including foreigners. This I find a surprising conclusion and one which I, for one, would most wholeheartedly welcome, since it would mean that I would be able to buy shares below their real worth as foreigners hasten to sell them and then realize above-normal profits as I sell them to the foreigners hastening to buy them back. I would suggest that further evidence is required before Mr. X.Y.Z.'s argument can be accepted.

Then, to our sorrow, we find that the foreigners are speculators and not "staid investors". I would have thought that the existence of speculators in a market such as the stock market is a sure sign of the existence of a relatively efficient market and therefore their presence a distinctly healthy sign.

We then move onto general economic analysis and

find that the Government's economic policy is "made more difficult to implement when it has no control over capital flows". This appears to me to confuse inability to control with unwillingness to control. I think that the Reserve Bank has more than sufficient instruments to control the economy - provided the Government permits it to do so.

But the most serious consequence of permitting the foreigners to stay is that the growth of the peoples' capitalism is being defeated by the "unseemly wild swing in prices" which the foreigners have caused. Again, I personally see this as yet further evidence of the efficiency of the stock market because I believe the "small investor" is seeking an above-average return on the stock market and in an efficient market this does not exist for any long period of time. Instead, finance theory tells us that he is better off by investing through an institution, which apparently is what he has done and is doing. As for the fluctuation in prices, I really do not think that one has to go past the failure of the reality of mining discoveries to meet expectations and the current state of the economy (and in particular the level of interest rates and profits) to find a fairly plausible explanation.

Finally, we find that our unpatriotic major brokers are flogging the farm back to foreigners at a "discount". This statement really is insufficient basis for policy making. For foreigners buy the bad, as well as the good, investment and it is really not worth the effort to attempt to separate the good and the bad, even if we know how. So we must rely on the net cost of foreign investment as a criterion for judging its usefulness and there is no evidence as yet presented to show that this is excessive.

Sir, I find it rather sad that at a time when the Stock Exchange is under increasing attack from the opponents of capitalism a defender of the stock market should propose yet another control that would help reduce the efficiency of the market's operation.