SHARE PRICE FACTORS

In comparison to the wealth of overseas literature which has been published on the theory of share prices (with accompanying empirical evidence), there seems a distinct lack of Australian contributions in this field. This is not to say that the economic importance of share prices is overlooked. Rather, the part that share prices play in channelling the flow of new capital into the various industries and firms is often stressed, and going one step further, it is recognised that, as a result, share prices influence the pattern and rate of economic growth.

There are two main avenues in which one could examine factors which influence or determine share prices:

(i) There is the problem of what determines the general level of share prices, i.e., why is it that at some times share prices as a whole move up, whereas at other times, all prices tend downwards?

Although this article is not concerned with this particular aspect, it is perhaps worth making an obvious point in this connection. Thus, as an investor has a choice of buying a wide range of securities including bonds and shares, the relationship between the rate of interest obtainable on a bond and the dividend yield obtainable on a particular share must be of some significance. Therefore, it is likely that in times of rising interest rates, other things being equal, dividend yields on shares will, in general, tend to increase also. (This, of course, requires a fall in the general level of share prices.) We have not, it should be noted, stated that the connection between the bond rate and dividend yields is necessarily rigid. We have simply stated that, other things being equal, a change in one variable is likely to be accompanied by a change in the other. Other things, however, are never equal, and consequently other factors may be presumed to influence the general level of share prices.

(ii) Of perhaps greater interest to security analysts is the problem: "Why is it that, at a point of time, the share price of some companies is relatively much higher or lower than the share price of some other company, say, in the same industry, e.g., why is Tooth's share price relatively much higher than Toohey's?" The problem in this case is, using cross-section data, to attempt to determine the factors that "explain" the relative variations in share prices of various companies in, say, the same industry.

From a priori reasoning, one might expect share prices of companies to be some function of dividend rates, earning rates, size of company, industry in which company operates, size of reserves, vulnerability or otherwise to competition from imports and so on. That is, we might guess intuitively that, say, the higher the dividend rate of a company, then other things being equal, the higher its share price. If we wished to be a little more sophisticated, we might hypothesise that the share price of a company depended on, say, the immediate dividend rate and its past rate of growth. (This latter variable being used to denote, say, the likelihood of the future rate of growth in per share dividends.)

At this stage we would have a "model":

\[ \text{share price} = f(d, \text{'}d\text{'}) \]

where \( d \) and \( \text{'}d\text{'} \) are the dividend and rate of growth of dividends respectively.

For simplicity we could rewrite the model as \( \text{S.P.} = a \cdot d + b \cdot \text{'}d\text{'} \) (where "\( a \)" and "\( b \)" are constants).

By gathering cross-section data (e.g., picking one industry so as to reduce or eliminate the inter-industry variability factor, and compiling for a number of companies share prices, dividend rates and past growth rates in per share dividends) it is possible to use statistical techniques to determine whether the observed variability in the share prices is "explained" by variations in our respective variables. In simple terms, our analysis would yield "partial regression coefficient" estimates, \( a_1 \) and \( b_1 \), which would tell us:

(i) the amount by which the share price of a company would, on the average, change per unit change in \( d \) (when \( \text{'}d\text{'} \) is taken as being constant)

(ii) the amount by which the share price of a company would, on the average, change per unit change in \( \text{'}d\text{'} \) (when \( d \) is taken as constant).

If we say that our regression coefficient estimates are "significant", it means that they have passed certain statistical tests. Consequently, the variables...
chosen \( (d \text{ and } 'd) \) may be regarded as “explaining” the variability in share prices of the particular industry group in question. The actual numerical values of \( a_1 \) and \( b_1 \) would tell us which variable was the more important “explanatory variable” (e.g., if our variables chosen were the dividend rate \( (D) \) and retained earnings \( (RE) \) of a company, and the partial regression coefficient estimates were 4 and 1 respectively, it would indicate that £1 of \( RE \) has the same effect on the price of a share as 5/- of earnings paid in dividends).

As will have become apparent by now, it is comparatively easy for someone to be “original” in this field. All that is required is a hypothesis and the ability to test it and interpret the solution. Hence it is not surprising that in America where this topic has been of great interest for some time now, numerous and, at times, apparently conflicting theories have been put forward.

The commonest of all is the **dividend hypothesis**. Among the strong advocates of this theory are Graham and Dodd (known for their book “Security Analysis”), who point out in support that it is the considered and continuous verdict of the stock market that liberal dividends are overwhelmingly favoured to niggardly ones. (Hence the share prices of, e.g., Borg Warner and Henry Jones would need to be “explained” by other factors.) They argue that (the outside) or public shareholder gets no tangible, realisable benefits from his investment except via dividends received thereon, or via market price appreciation. **The latter is usually dependent on the former.**

On the other hand, say Graham and Dodd, putting up a “straw man”, if an outside investor knew that a profitable business was never going to be sold out or dissolved, the value of the stock to him would be virtually nil. If we assume indefinite continuance of the firm, the theoretical importance of earnings is confined to their subsequent effect on dividends paid, either current or future. And, as if to clinch the argument, they point out that it is an accepted tenet of financial theory that the present value of any common or preference stock (or any other investment, for that matter, assumed to have no maturity or re-payment date for the principal) is the sum of the discounted present values of all the future expected dividends or interest payments therefrom.

As a refinement to the dividend hypothesis, Myron J. Gordon (in an article in the May, 1959, Review of Economic Statistics) makes use of his observation that “the value the market places on a dividend expectation derived from past dividends and retained earnings may be expected to vary among the companies with the **confidence in the dividend stream**”. This suggests that additional explanatory variables could be: The size of the company, the relation of debt to equity in the firm’s capital structure, and the stability of the company’s past earnings record.

Fisher (Economic Journal, Mar., 1961) in an attempt to improve his original model (with two variables only—dividends and undistributed profits) introduced a variable designed to act as a sufficiently reliable indicator of the market’s view of expectations. One particular indicator of expectations considered by Fisher is the past rate of increase in dividends. However, his “tentative conclusion” based on “limited information” is that the past rate of growth of per share dividends is not a very important variable in the explanation of share prices.

Using a technique outlined in simple terms above, I constructed a model with three variables (listed under) and tested it using Australian data.

The procedure taken was to select shares on an **industry basis** and then to eliminate shares for which there is no ready market. The former was done to eliminate the source of variation that would arise from variations in the market’s view of prospects in particular industries in a sample of shares drawn from a population of well-known active shares.

The three industry groups selected were:

A. Food, Drink and Tobacco.
B. Chemicals, Paper, Glass, Rubber, etc.
C. Steel and Engineering.

These are three Sydney Stock Exchange industry classifications, and the companies listed within each of the above industry groupings as a sample for the Sydney Stock Exchange’s index of share prices were taken as representing the sample for our purposes.

In all three cases, the last sale price taken was the one recorded on the last day of the month in which the company’s annual accounts were presented (for either the financial year ended June 30th, 1962, or December 31st, 1962, though the majority are for the former). The dividend rate was taken as the rate paid in the financial year covered by the accounts. The shareholders’ funds/ordinary capital ratio was taken from the annual accounts; and the rate of growth of dividends was for industry A calculated over the last ten years, and in B and C over the last five years, in both cases worked out on the assumption that in the case of any “rights” issues, the “rights” arising out of the issues were sold in order to buy old shares in the company so that no additional capital outlay was required.

**Variables Chosen:**

1. **Current dividend.** The justification for this variable lies partly in the fact that all models of other writers always come up with sig-
nificant partial regression coefficients for this variable. Apart from this observed fact, if the Keynesian view of market psychology is accepted, then investors will assume, in the absence of specific information about the future, that the current state of affairs will continue. In the case of dividends this is not so naive, for it is observed by Lintner (American Economic Review, May, 1956) that dividends vary less over time than profits, directors tending to distribute only what they think can be maintained. Lintner suggests that this observation indicates that dividends are "the primary and active variable in most situations", being determined by essentially long-run considerations. If this is so, then current dividends give a good guide to a company's prospects, and so are indicative of its future expected dividends.

2. Past rate of growth of dividend. As investors commonly regard past earnings as a guide to future earnings, there appears to be no reason why the reasoning can't apply to dividends as well. In fact, when it is considered how dividends increase, this feeling is confirmed. For, dividends received on a certain outlay incurred in the past can increase via:

(i) a single increase in the dividend rate paid by the company;
(ii) a bonus issue followed by a less than pro-rata cut in the dividend rate on the bonus increased capital;
(iii) a "rights" issue (where it is assumed that the "rights" are sold, and old shares bought with the proceeds, so that no extra capital is outlaid), followed by a less than pro-rata cut in the dividend.

As, for most companies, a certain past rate of growth in dividends has arisen probably as a result of cash and bonus issues more than simple dividend rate increases, this suggests that the higher the past rate of growth in dividends the higher should be the present price of a company's shares as its chances of future capital benefits (and so dividend increases) are better than in companies where past rates of growth of dividends have not been so great, i.e., it is felt (in spite of Fisher's doubts) that the past rate of increase in dividends is a good indicator of investor's expectations as to the future course of dividends.

3. Ratio of shareholders' funds to ordinary paid-up capital. This was chosen simply as a variable reflecting speculative influences in the market, i.e., it is thought that the greater the "reserves" a company has, then the company's share price can be pushed up by investors anticipating capital benefits. Because no other (measurable) variable was thought of, the above was eventually chosen as being the "best of a bad lot", with the intention of using it as an experiment.

Results
The results, to put it mildly, are very mixed. Thus, the results from the Food, Drink and Tobacco sample are good. With all the three variables included in the regression equation, a high $R^2$ (coefficient of determination) of 90.5% was obtained. The coefficient of determination tests the proportion of the total variation in Y (share prices) "explained" by the existence of relationships with the X's (the chosen variables).

As indicated above, a more important test of relationships between the Y and X's is to determine whether or not each partial regression coefficient is significant. (A partial regression coefficient tells us that amount by which Y will, on the average, change per unit change in, say, $X_i$ when $X_j$ and $X_k$ are taken as constant.) In the Food, Drink and Tobacco sample, the dividend coefficient and the shareholders' funds/ordinary capital coefficient were both very significant. The rate of growth in dividends coefficient was not significant, but not too far from being significant.

In the "Chemicals, Paper, Glass, Rubber, etc." sample, the results were not good with all three variables included. $R^2$ was 70%, but the dividend coefficient and the S.F./ordinary capital coefficient were not significant, though the rate of growth in dividends was significant. However, it will be immediately realised that this Sydney Stock Exchange industry classification is a very poor one, and thus the source of systematic variation which arises from variations in the "market's" view of prospects in particular industries is not entirely eliminated.

The "Steel and Engineering" sample's results contained a surprise, in that the dividend coefficient estimate was not significant and, in fact, had the wrong sign. The reason, perhaps, was that the highest priced stocks in this classification (B.H.P. and McPhersons, e.g.) were associated with lower than industry average immediate dividend payouts. Further, the fact that the S.F./ord. capital coefficient was not significant, but that the past rate of growth in dividends coefficient was very significant, suggests that in this industry group variations in share prices are "explained" by the past dividend growth rate best of all. Once again, this industry classification is stretching the meaning of "industry" which means that the inter-industry variation referred to above is not entirely eliminated. (Of course, as far as the Sydney Stock Exchange is concerned, there are not enough companies in any particular industry listed on the Exchange, so that in order to make up a sample of an acceptable (minimum) size, some "lumping together" is necessary.

Conclusion
Two broad conclusions emerged from the results:
(i) The past rate of growth in dividends performed as well as the immediate dividend payment as variables attempting to explain variations in share prices.
(ii) Different variables are of importance in explaining variations in share prices in the various industries.