

THE DIVIDEND STRATEGY OF IRISH MANUFACTURING COMPANIES

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Introduction

The analysis which is utilised is based on the Lintner (1956) model. Lintner, from a study of 28 companies over a seven year period (1947-1953), developed the following model of dividend payment;

$$D_{it} = A_i + C_i (D^*_{it} - D_{i(t-1)}) + U_{it}$$

This equation states that the change in the current dividend level (D_{it}) is a function of;

- A constant (A_i) which will generally be positive to reflect the greater reluctance of firms to reduce then to raise dividends.
- A parameter (C_i) reflecting the difference between a firm's target payout ratio and the actual payment made in the previous period ($D_{i(t-1)}$).
- The expected current period dividend (D^*_{it}) if it were based on the target payout ratio X current year profit after tax.
- A residual term (U_{it}) representing the discrepancy between the observed value for D_{it} and the value expected given the other terms in the equation.

Lintner finds earnings to be a prime determinant of dividend policy, with the relationship being one of a partial adjustment in dividend payments in response to changes in the level of after tax earnings. This is based on Lintner's observation of managements' belief that the market puts a premium on shares of companies exhibiting stability or gradual growth in their dividend rate. The principal means of achieving this is by changing dividends in any given year by only a percentage of the change in earnings. Further partial adjustments are made in subsequent years if appropriate.

This type of dividend policy means that changes in dividend payments are less variable than changes in earnings. For example, in a period when

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earnings decrease, the rate of dividend payment could be maintained or even increased, as the latter will be adversely affected to some extent by this period's earnings decline, but also favourably influenced by increases in previous periods' earnings which (because of the partial adjustment policy) have yet to be reflected in the dividend rate.

Lintner established that the dividend policy of the firms in his sample was based on well established practices and policies. He found that the existing rate of dividend was the benchmark in determining the dividend of the following period. It was also apparent that there was more of a general reluctance to decrease than to increase dividends.

Lintner's model has been tested on many occasions, and in all cases a very good fit of the Lintner equation has been found. In a study based on U.K. data, Ryan (1974) stated that interfirm variation in dividend policy was well explained by an extension of the Lintner model.

Stewart (1987) found, using Irish data at the aggregate level over the period 1964-1984, that there was significantly greater variation in earnings than in dividends. This would appear to be consistent with the stability of dividends implied by the Lintner model.

Brittain (1964) maintained, that because of changes in the tax laws relating to depreciation in the post war years, the depreciation figures included in firms' accounts were invalidated. He suggested that after 1941 firms would be more likely to use cash flow (net income + depreciation) instead of earnings in determining their dividend policy. Alternatively net income and depreciation could be used separately.

Fama and Babiak (1968), based on a test sample of 392 U.S. firms, found that Lintner's model performed well in explaining the dividend changes of individual firms. On the other hand their test results showed that Brittain's model was unreliable when applied to individual firms (Brittain has used it with aggregate data).

Fama and Babiak however claim that Lintner's model can predict dividends more successfully when the level of earnings for (t-1) is added, and the constant term A_i is suppressed.

This paper takes the following approach;

(A) In the first section, the Lintner model is applied to the earnings and dividend data of a sample of Irish public manufacturing companies (covering the period 1980-1984). The results are then compared with Fama and Babiak's tests of the Lintner model.

(B) In section two the tests are extended to incorporate the lagged earnings variable suggested by Fama and Babiak, and the results of the Irish data are compared with those obtained by Fama and Babiak using U.S. data.

(C) Changes in earnings subsequent to changes in dividend are analysed to establish whether changes in dividend are a lead indicator of changes in earnings.

(D) This section summarises the results of our findings and considers some variables which may have an explanatory value.

Database

The data used for the empirical tests in the following sections was collected on forty public companies in the manufacturing sector over the 5 year period 1980-1984.

Tests of the Lintner Model

The absolute and percentage change in both equity profit (after tax and before extraordinary items) and dividend was calculated, on a "year-on-year" basis, changes in capital structure were analysed and incorporated to provide dividend and earnings per share, giving a total of 160 paired observations of changes in earnings and of dividend. The change in annual dividend for all companies was analysed against the annual change in profits. These results are given in Table 1.

Table 1:

Direction of Change in Earnings	Percentage of Companies which		
	Increased Dividends	Maintained Constant Dividends	Reduced Dividends
+	40	54	6
-	19	56	25

In this single period analysis there is a strong tendency for companies to maintain their dividend at the level of the previous year regardless of the direction of the change in earnings. This will inevitably result in dividends being less volatile than earnings. During years of profit decline 56% of the companies observed hold their dividend constant, while 19% actually increase it. For companies which experience a profit increase, 94% either increase their dividend or hold it constant. However of the 40% of these companies which actually increase their dividend, the rate of increase in profits was on average 93% while the average increase for such companies in dividends was 27%. There were but three cases where

the annual percentage increase in dividend was greater than the annual increase in earnings. Two further points are noteworthy; firstly, that of those companies which actually do change their dividend, it is usually in the same direction as the change in profits, secondly, companies are relatively more reluctant to reduce their dividends when they experience a reduction in profit than they are to increase dividends when they experience an increase in profit.

Such patterns of behaviour would appear to be consistent with the Lintner Model (1956) of the partial adjustment theory. Lintner argued, inter alia that management “**avoid making any changes which might have to be reversed in a year or so**” i.e. dividends are but partially adjusted to changes in current levels of earnings, further partial adjustment taking place in future years, if justified. Thus a stepwise process of dividend adjustment takes place which has the advantage that should profits decline in the following year(s) a cushion exists which prevents an erosion of dividend. This reduction in dividend being particularly avoided given the possibility that the market may view dividend change as an indication of future profit change.

The results shown above for the Irish data can be compared with those reported by Fama and Babiak (1968) who found that their tests were also supportive of the Lintner model. The Fama and Babiak single period analysis is given in Table 2 below.

Table 2:

Direction of Change in Earnings	Percentage of Companies which;		
	Increase Dividends	Maintain Constant Dividends	Reduce Dividends
+	66	14	20
-	43	18	39

A comparison of Table 1 and Table 2 indicates a much more pronounced tendency among Irish companies to maintain dividends at constant levels as opposed to the US companies, and also a relatively weaker tendency for Irish companies to change their dividends in the opposite direction to their change in earnings.

Tests using Lagged Earnings Variable

The partial adjustment model does however suggest that the current dividend is a function not only of the current profit of the company but also of the past profits of the company. Fama and Babiak tested the extent

of the distributed lag by examining the combined impact of changes in profit in previous years and in the current year on the changes in dividend in the current year. The results of the two period analysis i.e. the impact of two years changes in earnings on the change in dividend in the second year are shown below in Table 3 which gives the Fama and Babiak results of the US data, and in Table 4 which gives the analysis of the Irish data.

Table 3: *Fama and Babiak*

Direction of Change in Earnings		Percentage of Companies which is the current year;		
Current Year	Previous Year	Increase Dividends	Maintain Dividends	Reduce Dividends
+	+	75	11	14
+	-	54	17	29
-	+	50	17	33
-	-	32	19	49

Table 4: *Irish Data*

Direction of Change in Earnings		Percentage of Companies which in the current year;		
Current Year	Previous Year	Increase Dividends	Maintain Dividends	Reduce Dividends
+	-	42	58	—
+	+	40	50	10
-	+	23	62	15
-	-	16	58	26

A comparative analysis of the results indicates, as was also noted in the case of the single period analysis, a very much stronger tendency, across all rows, for Irish companies to maintain constant dividend. In fact for the Irish data in at least fifty per cent of cases dividend is maintained constant regardless of the direction of the changes in earnings over both the current and previous year.

There is evidence of a clear pattern in the Irish data i.e. the pattern of changes in earnings which ranks the order of increases in dividend is the converse of the pattern which ranks the order of decreases in dividend.

However this pattern is not consistent with a distributed lag effect, i.e. while the order of the last two rows conforms to the distributed lag pattern, the order of the first two rows does not. We would for instance expect in the presence of a distributed lag that the (+ +) pattern of

earnings would correspond with a higher proportion of dividend increase than the (+ -) pattern. Such is not the case. With the last two rows we would expect that in the presence of a distributed lag the pattern in earnings of (- -) would correspond with a higher proportion of dividend decreases than would the (- +) pattern of earnings. Such is the case.

Given the ambiguity in the result of the two period analysis, the relationship between dividend change in one year and earnings changes over a three year period was examined. Once again we have the benefit of being able to perform a comparative analysis with the Fama and Babiak results. The Fama and Babiak results are given in Table 5, the Irish data is analysed in Table 6.

Table 5: *Fama and Babiak*

Current Year	Direction of Change in Earnings		Percentage of Companies which in the current year;		
	Previous Years	Two Years Previous	Increase Dividends	Maintain Dividends	Reduce Dividends
+	+	+	81	8	11
+	+	-	67	15	18
+	-	+	58	17	25
-	+	+	54	15	31
+	-	-	49	17	34
-	+	-	45	19	36
-	-	+	35	17	48
-	-	-	25	25	50

Table 6: *Irish Data*

Current Year	Direction of Change in Earnings		Percentage of Companies which in the current year;		
	Previous Year	Two Years Previous	Increase Dividends	Maintain Dividends	Reduce Dividends
+	+	+	44	44	12
+	-	+	44	56	—
-	-	+	39	38	23
+	+	-	38	54	8
+	-	-	27	64	9
-	+	-	25	37	38
-	+	+	25	75	—
-	-	-	—	89	11

From the US data a pattern clearly emerges, which supports the distributed lag effect. As Fama and Babiak state "if two out of three of the profit changes . . . are negative, the proportion of negative (changes in dividend) for the sequence (- - +) is higher than for the sequence (- + -) which in turn is higher than for the sequence (+ - -)" i.e. in the case of reduction in dividend, the impact of a single increase in earnings decreases over time, which is strongly supportive of the lagged response.

By contrast with the US data, the Irish data shows (once again) a very strong tendency among the companies to maintain dividend at a constant level. Also the Irish data does not show any strong evidence that the pattern of earnings which ranks the increase in dividends is the inverse of the pattern which ranks the reduction in dividends. Also the patterns which rank *either* the increase in dividends, or the reduction in dividends are not consistent with the lagged response argument on which the partial adjustment theory rests. It would therefore appear that the Irish data is not supportive of the argument that, during the period 1980-1984, Irish manufacturing companies were conforming to the pattern which would suggest that they were utilising the partial adjustment model of dividend payment.

Dividend change as a lead indicator of earnings change

Given the lack of evidence which is supportive of the partial adjustment theory, the ability of a change in dividend to predict a change in earnings was tested. Initially the change in dividend in the year immediately preceding the change in earnings was tabulated. The data consists of 120 matched observations and the results are given in Table 7 below:

Table 7:

Direction of Change in Dividends Previous Year	Direction of Change in Profits Current Year			Total
	+	-		
+	No.	14	13	27
	%	52%	48%	100%
0	No.	35	33	68
	%	51%	49%	100%
-	No.	17	8	25
	%	68%	32%	100%
				120

Casual inspection of Table 7 above would indicate that in the case of either positive change or no change in dividends in the previous year, the direction of change in profits in the subsequent year is divided very nearly on a 50:50 basis between increases and decreases in earnings i.e. the direction of the change in earnings is independent of the direction of the change in dividends in the previous year. This would indicate little predictive power in these two cases. In the final case, that of a decrease in dividend in the previous year, in 68% of these cases, such a decrease in dividend was followed by an increase in earnings in the subsequent year.

On the assumption that the observations are independent, the Chi Square test was applied to the individual rows of the findings in Table 7. Using the null hypothesis that the change in earnings is independent of the direction of the change in dividends in the previous year, the Chi Square values of the rows are calculated at 0.037, 0.0588 and 3.24, which values would support the null hypothesis at the 0.05 level of significance. However, at the 0.01 level of significance the null hypothesis would in the case of row No. 3 be rejected. In the case of row No. 3 the use of the change in dividends as a lead indicator would indicate that it is a negative indicator i.e. decreases in dividend in a particular year are usually associated with an increase in earnings in the following year.

However support for the predictive ability of row three is weak, and we are inclined to accept the null hypothesis that there is no ability of changes in dividend in a particular year to predict the direction of change in earnings in the following year.

The analysis was extended to examine whether there was any predictive information relating to future earnings contained in the pattern of changes in dividend over two years. The results are given in Table 8 below.

Casual inspection of the individual rows of Table 8 would indicate very little support for the predictive ability of any pattern of dividend change.

In order to utilise a Chi Square test, on the assumption that the observations are independent, the matrix was collapsed as shown in Table 9, and the Chi Square value for the individual rows was calculated. These are shown in Table 10 below.

Table 8:

Row	Direction of Change in Dividend		Direction of Change in Earnings		
	Previous Year	Current Year	Increase In Earnings	Decrease In Earnings	Total
1	+	+	No. 6 %	7 54%	13 100%
2	+	0	3 75%	1 25%	4
3	+	-	2 29%	5 71%	7
4	0	+	2 50%	2 50%	4
5	0	0	18 53%	16 47%	34
6	0	-	3 75%	1 25%	4
7	-	+	7 88%	1 12%	8
8	-	0	1 33%	2 67%	3
9	-	-	-	3 100%	3
					80

Table 9:

Dividend Pattern	Direction of Change in Earnings			
	Increase	Decrease		
At least one plus, no minus	11	10		
0 0	18	16		
At least 1 minus	13	12		
		42	38	80

The Chi Square values are given below in Table 10.

Table 10:

	Chi Square Value
Row 1	.047
Row 2	.117
Row 3	.04
Chi Square Critical Value	
0.05 level of significance	3.84
0.01 level of significance	6.63

The null hypothesis that changes in dividend in prior years is independent of changes in earnings is supported in all cases at the 0.05 level of significance. We are therefore strongly inclined to accept the null hypothesis. Acceptance of this hypothesis is in effect a rejection of the proposition that changes in the sign of past dividends have a predictive ability in forecasting the direction of change in future earnings.

Summary and Interpretation

The results of our tests suggest that the Lintner single period model provides a reasonable representation of the dividend policies of companies in our sample. However, the results using the Irish data do not support the partial adjustment model when a lagged variable is introduced. In particular, the Irish data shows a significantly greater trend of maintaining dividends at the same level as in previous years.

Consideration of how the stability of dividend policy of Irish public companies *might be explained* may provide avenues for further exploration.

There is a significant amount of evidence in the finance literature of the reluctance of management generally to reduce dividends, Lintner (1956), Griffin (1976), Kalay (1980). This is primarily because of the adverse effect which such a signal might have on a firm's share price. The following may be explanatory variables as to why Irish companies displayed a marked preference for maintaining dividends constant during the period 1980-1984;

- (A) That a number of factors in the period 1980-1984 combined to discourage the companies in our sample from generally increasing their level of dividend and,
- (B) That although the factors in (A) might have merited a reduction in dividends, management was reluctant to do so because of the perceived adverse effect which it would have on share prices.

The remainder of this paper is devoted to an exploratory survey to identify such factors as those described in (A) above prevailed during the 1980-1984 period;

Taxation

The general case is that lower dividends are favoured because of dividends being more heavily taxed than capital gains, Litzenberger and Ramaswamy (1980). Empirically, however, a strong case has not been found to support the idea of lower dividends being preferred for taxation reasons, (Miller and Scholes 1982).

Poterba and Summers (1984) however found that changes in the taxation of dividends have a significant effect in creating a premium required by investors to accept cash dividends. As the UK and Irish taxation systems are broadly similar, the findings of Poterba and Summers which are based on British data, may be more relevant in evaluating our results.

In the 1980-1984 period there were at least four tax-related reasons which may have discouraged Irish manufacturing companies from increasing their dividend levels. Two of these effects are outlined here, and the other two are discussed under the heading of 'Investment' below.

Advance Corporation Tax (ACT) was introduced in the Republic of Ireland in June 1983. ACT is a form of differential profits tax in that companies paying dividends are obliged to pay ACT while those which make no distribution from profits have no liability for ACT. Any ACT paid can be offset against a company's mainstream corporation tax liability, but in the case of manufacturing companies claiming 100% capital allowances on fixed asset additions during the 1980-1984 period, this set-off may not have been of any benefit. The existence of ACT would have amounted to a '**distribution penalty**' on those companies unable to offset their ACT liability, and it is likely that it may have led to a freeze in their dividend levels. On the other hand, the fact that a reduction of 50% of the full ACT was allowed as a transitional measure could arguably have had the opposite effect.

There is conflicting evidence in the literature relating to the effect of differential profits tax. Rubner (1964) covered the period 1947-1958 and found no evidence of a link between the level of distributions and differential profits tax. He observed a relatively small rise in pay out ratios in the UK after 1958 when differential tax rates were repealed. Feldstein (1967) criticised the methodology used by Rubner and concluded that his results were unwarranted. Feldstein maintained that differential tax rates did have a substantial effect on dividend policy. More recently Briston and

Tomkins (1970) maintain that taxation does not radically alter the dividend policy of companies.

A further effect of the introduction of ACT was to reduce the tax efficiency of 'Section 84 lending', which was inadvertently permitted by the 1976 Finance Act. This section specified that the interest paid on certain loans would be deemed to be a distribution and therefore (under Irish tax legislation) would not be subject to tax in the hands of the financing institution. From 1983 onwards, companies raising this form of finance were liable for ACT on the loan interest. Stewart (1987) documents how this had the effect of reducing the amount of Section 84 loans raised after May 1983. It is possible that, because this may have made it more costly for companies to finance dividend payments, there was a disincentive to further increase dividend levels in 1983 and 1984.

A second taxation effect occurred during our research period, but this time at a personal level. In 1981 the corporation tax rate on the profits of manufacturing companies was reduced to 10%. Distributions to personal shareholders were however subject to very high levels of income tax as the tax credit allowed to shareholders was only 1/18 of the dividend paid. The importance of this factor in influencing dividend policy depends largely on the extent to which shares were owned by private investors. A study by the Dublin Stock Exchange reported by Keane (1988) showed that in 1986 21.6% of total shares were held by private investors.

Investment

Although investment in assets and dividend payments are not necessarily interdependent, it is likely that they are to some extent inter-related.

Fama (1974) maintains that there is no evidence of interdependence. Pogue (1971) found that monetary policy may influence dividends through its effect on a number of variables, including investment. Higgins' (1972) results suggest that both fund requirements for investment purposes and debt financing affect firms' payout ratio. McCabe (1979) finds strong evidence of interdependence between the spending (investment and dividend) decisions and the fund raising decision (new debt).

During the period of our study Government monetary policy was aimed at encouraging reinvestment in manufacturing companies and also at providing taxation reliefs to compensate companies for the extent to which the historic cost convention overstates profit in times of rising price levels. Two such reliefs were accelerated capital allowances and stock relief.

Free depreciation in claiming capital allowances on certain fixed assets was introduced in 1971. It is possible that this may have provided an incentive for companies to maintain, rather than increase dividends in periods showing increased earnings.

Stock relief was introduced in 1975. After 1978, manufacturing companies were given a relief calculated as the increase in the value of stock during the period, less 20% of taxable income from trading. Stock relief may have encouraged a policy of maintaining constant dividends in the same way as accelerated capital allowances described above.

A spin-off effect of these taxation policies could have been to make the after tax cost of debt (to replace payouts) more expensive. This would be the case if a firm's taxable income was reduced to zero by capital allowances and stock relief.

Shareholder diversification

Up to 1988 Irish residents were prohibited from investing in securities denominated in foreign currencies. The opportunity to achieve risk diversification may have been partially impeded by this legislation, particularly in view of the size of the Irish Stock Exchange and its general lack of liquidity.

In these circumstances the companies in our sample may have attracted a shareholder clientele which placed a premium on stability in terms of the companies' dividend policy.

Demand for dividends

Although the Irish share price index fell by approximately 21% between the beginning of 1980 and the middle of 1982, it rose by approximately 82% between the middle of 1982 to the end of 1984. The substantial overall rise in the index during this period could have resulted in shareholders regarding capital gains as being of greater importance than dividends.

The fact that the level of private consumption fell in volume terms by 4.75% over the period 1980-84 may also indicate a depressed demand for dividend income during the period.

The variables discussed above may possibly be explanatory factors for our findings using the Irish data. Further research is however required to confirm if in fact this is the case.

The predictive ability of dividend change as a lead indicator of earnings

change was also tested. The results suggest that the direction of change in dividend of the companies in our sample did not have any predictive value as an indicator of subsequent changes in earnings.

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