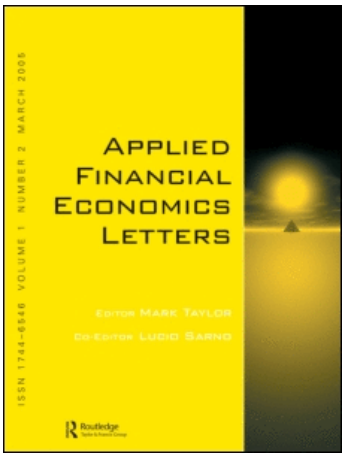

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Abdallah Atieh [a]; Simon Hussain [a]
[a] Newcastle University Business School, University of Newcastle upon Tyne, UK

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Disaggregating 'accounting earnings' to better explain UK dividends

Abdallah Atieh and Simon Hussain*

Newcastle University Business School, University of Newcastle upon Tyne, NE1 7RU, UK

The aim of our article is to investigate whether corporate cash flow and accruals data have a role to play in explaining dividends for a sample of nonfinancial UK firms between 1994 and 2004. We employ a cash flow variant of Lintner's (1956) dividend model similar to those used in prior research such as Brittain (1964) and Simons (1994). However, we examine the role of cash flows together with long- and short-term accruals components of 'accounting earnings'. Several studies have shown that disaggregated earnings components have greater explanatory power for future cash flows than either current cash flows or earnings data (Barth *et al.*, 2001; Al-Attar and Hussain, 2004). We find similar explanatory gains within the Lintner model framework for dividends.

I. Introduction

It is now more than half a century since Linter (1956) published a pioneering study in the *American Economic Review* that examined the determinants of dividend payments by US companies during 1946–1954. Lintner presents a model of dividend payments where the primary explanatory variables are current earnings and lagged dividends, which continues to influence international research studies into dividends (e.g. Tong and Green, 2005; McCluskey *et al.*, 2006). The model has retained its popularity among researchers but these days most empirical studies use a form of the model in which dividend changes are the dependent variable, and with datasets of individual company observations rather than the aggregated values of dividends employed by Lintner (e.g. Mookerjee, 1992; Simons, 1994; Charitou and Vafeas, 1998; Grullon and Michaely, 2002).

$$\Delta D_{i,t} = f(E_{i,t}, D_{i,t-1}) \quad (1)$$

where $\Delta D_{i,t}$ = change in total dividend for firm i from year $t-1$ to year t; $E_{i,t}$ = reported earnings for firm i in year t; $D_{i,t-1}$ = lagged total dividend of firm i.

Changes in current dividends will occur only where the expected future cash flows exhibit a medium or long-term shift, rather than merely reflecting shifts in expected one-year-ahead cash flow levels. Given that earnings data are expected to be a superior indicator of future cash flows than are current cash flow data (Beaver, 1989; Dechow, 1994), the presence of earnings as an explanatory variable in Lintner's model seems appropriate. Indeed, Charitou and Vafeas (1998) find that cash flow data generate no significant improvements

*Corresponding author. E-mail: simon.hussain@ncl.ac.uk

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when added to Lintner's model. However, it should be noted that an earlier study by Brittain finds that the substitution of cash flows for earnings in Lintner's model does lead to improved explanatory power.

More recently, several studies have appeared in the accounting literature (Barth *et al*., 2001; Al-Attar and Hussain, 2004) demonstrating that the disaggregation of earnings into its component variables, namely cash flows and accruals components, leads to improved explanatory power for future cash flows. Barth *et al*. report that these models display significant explanatory power for future cash flows up to at least 4 years ahead. This finding is important because a model that only explained one-year-ahead cash flows may offer very limited insights into dividend policy, but a model that explains cash flows several years ahead is likely to have greater power to explain current changes in dividends (Guay and Harford, 2000).

We will re-examine the Lintner model taking account of these recent developments. Specifically, we will investigate whether the disaggregation of current-year earnings into its component variables, namely cash flows, short-term accruals and long-term accruals, releases significant additional explanatory power for a vector of dividend changes.

II. Data and Analysis

All data for this study are extracted from Datastream for FTSE-100, FTSE-Mid 250 and FTSE Small Cap nonfinancial firms for each year from 1994 to 2004, inclusive. We collect the following accounting data: total annual dividend (D_t), reported (after tax) earnings (E_t), cash flows from operations (CF_t), long-term (depreciation) accruals (LA_t) and short-term accruals (SA_t) consisting of changes in inventory, accounts payable and accounts receivable; these data are then deflated by lagged total assets. Eliminating the extreme percentiles for each variable, a total of 2764 firm-year observations were collected for each variable.

We begin by estimating the cash flow version of the Lintner model and comparing its explanatory power relative to (a) the traditional version of the Lintner model, which uses earnings in place of cash flow and (b) our disaggregated-earnings model, which uses cash flows and both long- and short-term accruals:

$$\Delta D_{i,t} = \alpha_1 + \alpha_2 \mathrm{CF}_{i,t} + \alpha_3 D_{i,t-1} + \tau_{i,t} \quad (2)$$

$$\Delta D_{i,t} = \beta_1 + \beta_2 E_{i,t} + \beta_3 D_{i,t-1} + \upsilon_{i,t} \quad (3)$$

$$\Delta D_{i,t} = \delta_1 + \delta_2 \mathrm{CF}_{i,t} + \delta_3 D_{i,t-1} + \delta_4 \mathrm{LA}_{i,t} + \delta_5 \mathrm{SA}_{i,t} + \xi_{i,t} \quad (4)$$

These models are estimated using OLS and the explanatory power of models is compared via the adjusted R^2. To assess the statistical significance of any differences in explanatory power, we use the traditional F-test for comparing Equation 2 with 4, since Equation 2 is a restricted version of Equation 4. However, when comparing nonnested models (i.e. Equations 2 and 4 with Equation 3), we use the Vuong (1989) Z test-statistic to assess the significance of one model's superiority over another. The statistic is bidirectional (Greene, 1997, p. 945) and asymptotically distributed as standard normal.

On the basis of prior research on dividends, we expect that the coefficients for E_t and CF_t will be positive and that the coefficient for D_{t-1} will be negative. Our inclusion of accruals data follows from studies seeking to explain future cash flows rather than current dividend changes, but given the strong theoretical link between these, we expect the coefficients to follow a similar pattern: we expect the slope for SA_t to be positive, given that under normal conditions accruals should map to future cash flows. Our results are reported in Table 1.

The first point to note from Table 1 is that the estimated coefficients are consistent with pre-experimental expectations. Comparing the cash flow and earnings models, our results suggest that current cash flows offer inferior explanatory ability for dividends than current earnings. However, the Vuong test statistic indicates that 1.6% differential in the adjusted R^2 is not statistically significant.

When we add in the accrual adjustments that constitute the difference between cash flows and earnings, we find notably increased adjusted R^2 statistics: the addition of both long- and short-term accruals generates an increase of 5.9% in the model's explanatory power relative to the cash flow model and an increase of 4.3% relative to the traditional earnings version of Lintner's model. These improvements are statistically significant at the 0.05 level and suggest that current accounting data possess explanatory power for dividends. Specifically, the disaggregation of earnings into its components (cash flows and accruals) releases significant additional explanatory power. This reiterates the conclusions of Barth *et al*. (2001) and Al-Attar and Hussain (2004), who examine the disaggregation of earnings for the purpose of explaining future operating cash flows. Our results may also provide a rationale for the market's valuation of accruals as reported by Xie (2001).

Table 1. Explaining current dividend changes for UK companies (1994–2004) using variants of Lintner's model

	Cash flow Adj. R^2: 25.3% Model *F*-stat: 467.9*			Earnings Adj. R^2: 26.9% Model *F*-stat: 508.7*			Disaggregated earnings: cash flow, long- and short-term accruals Adj. R^2: 31.2% Model *F*-stat: 313.9*		
Explanatory variables	Coeff.	Sig.	*t*-Ratio	Coeff.	Sig.	*t*-Ratio	Coeff.	Sig.	*t*-Ratio
Intercept	0.003	*	6.44	0.004	*	11.97	0.003	*	6.36
CF_t	0.38	*	20.58				0.60	*	26.43
E_t				0.41	*	22.22			
D_{t-1}	−0.55	*	−29.67	−0.56	*	−30.61	−0.64	*	−33.97
LA_t							−0.24	*	−12.49
SA_t							0.30	*	14.44

Notes: Cash flow: earnings: $\Delta R^2 = 1.6\%$ increase (Vuong statistic: 1.18), disaggregated earnings: $\Delta R^2 = 5.9\%$ increase (*F*-statistic: 119.6*). Earnings: disaggregated earnings: $\Delta R^2 = 4.3\%$ increase (Vuong statistic: 5.41*). Estimation: OLS ($n = 2764$ for each regression). All variables deflated by lagged total assets.
* Indicates rejection of the null hypothesis at the 0.05 level for each test statistic.

III. Conclusion

Our results lead to several important conclusions that may form the basis for further investigation. First, we find that the use of cash flows as a replacement for earnings in the Lintner model leads to a reduction in the model's explanatory power: this is consistent with the aims of accrual accounting and the construction of 'accounting earnings' as a superior measure of future corporate performance (which determines dividend changes), and with the limited usefulness of cash flows identified by Charitou and Vafeas (1998). However, Vuong's (1989) test statistic indicates that this difference is not statistically significant. We find no evidence to support Brittain's suggestion that substituting cash flows for earnings improves model fit. Secondly, we find that the explanatory power of Lintner's model is improved significantly by the disaggregation of earnings into cash flows and accruals. This is in-line with US and UK evidence on future cash flows and demonstrates a potential role for accrual data in assessing future corporate dividends and is a possible rationale for the pricing of accruals by the market.

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