Journal of Accounting Research
Vol. 30 No. 2 Autumn 1992
Printed in U.S.A.

Capsules and Comments

The Role of Earnings Levels in Annual Earnings–Returns Studies

ASHIQ ALI* AND PAUL ZAROWIN†

1. *Introduction*

Easton and Harris [1991] show that both earnings levels and changes (deflated by beginning-of-period stock price) have explanatory power when they are included simultaneously in a regression of annual returns on earnings. Many accounting studies used earnings changes as a proxy for unexpected earnings under the assumption that annual earnings are purely permanent.[1] We show that, as suggested by Easton and Harris, the explanatory power of the earnings level variable is consistent with the presence of transitory components in annual earnings.

*Columbia University and New York University; †New York University. The comments of Gary Biddle, Robert Bowen, Suresh Govindaraj, Trevor Harris, Joshua Livnat, Stephen Ryan, Terry Shevlin, D. Shores, and workshop participants at CUNY-Baruch, Ohio State University, Rutgers University, and the University of Washington are gratefully acknowledged. All errors remain our responsibility.

[1] The characterization of annual earnings as a random walk has been supported by studies such as Ball and Watts [1972], Albrecht, Lookabill, and McKeown [1977], and by Watts and Leftwich [1977]. Examples of returns–earnings association studies assuming the random walk model for annual earnings include Beaver, Lambert, and Morse [1980], Bowen, Burgstahler, and Daley [1987], Lustgarten [1982], Beaver, Griffin, and Landsman [1982], and Livnat and Zarowin [1990].

We assume that annual earnings follow an *IMA* (1,1) process, which permits both permanent and transitory components, and show that earnings levels act as an additional proxy for unexpected earnings when the previous period's earnings are not purely permanent, and thereby contribute to the explanatory power of the unexpected earnings–abnormal returns model. We also show that the estimated earnings response coefficient (*ERC*), the sum of the coefficients on all the proxies for unexpected earnings (Brown et al. [1987]), is expected to increase from including the earnings level variable, when earnings are not purely permanent. Furthermore, the more transitory are the previous period's earnings, the greater is the measurement error in the earnings change variable as a proxy for unexpected earnings, and the greater is the expected incremental explanatory power and increase in *ERC* when the earnings level variable is added.[2]

We estimate the unexpected earnings–abnormal returns regression model with both earnings changes and levels, for firms with different degrees of permanent and transitory components in their previous period's earnings, based on beginning-of-period earnings–price ratios. For firms with predominantly permanent earnings in the previous period, the incremental explanatory power and increase in *ERC* from including the earnings level variable are small, as compared to a regression model with only the earnings change as an explanatory variable. For the firms with predominantly transitory earnings in the previous period, the incremental explanatory power and increase in *ERC* from including the earnings level variable are much larger. These results are consistent with the view that the earnings level captures transitory components in earnings and suggest that measurement error in unexpected earnings has contributed to the low R^2s and *ERC*s in previous research.[3]

In related work, Ramesh and Thiagarajan [1991] claim that the Basu [1977] *E/P* effect might be responsible for Easton and Harris's [1991] results. We address this issue below and find no support for this claim.

---

[2] For evidence on the presence of transitory components in annual earnings, see Brooks and Buckmaster [1976], Beaver and Morse [1978], and Ou and Penman [1989]. Ohlson [1989] also proposes a model that predicts that both earnings levels and changes are associated with returns. Our analysis and his are based on the notion that earnings have both permanent and transitory components and that the role of the earnings level relates to the transitory nature of earnings. Our analysis is based on a linear relation between *abnormal* returns and unexpected earnings, in the spirit of the studies of earnings response coefficients by Kormendi and Lipe [1987] and Collins and Kothari [1989]. Ohlson's model is based on a linear relation between *raw* returns and earnings, earnings changes, and dividends. Easton and Harris [1990] empirically examine the implications of the earnings level variable in Ohlson's model.

[3] For example, as Lev [1989] points out, the R^2s in annual unexpected earnings–abnormal returns regressions are about 5% to 10%. As Easton and Zmijewski [1991] point out, some researchers claim that *ERC*s should approximately equal the price-to-earnings ratio, if annual earnings follow a random walk.

Ohlson and Shroff [1992] show analytically that the earnings level variable will help explain returns if it helps forecast earnings. However, they do not provide any empirical evidence on when the earnings level variable will be most important. Thus, we contribute to the literature on the relation between annual returns and earnings by illustrating a context in which the earnings level variable is most important and providing empirical evidence on our predictions.[4]

2. *Earnings–Returns Model*

We estimate the following unexpected earnings–abnormal returns model (see Easton and Harris [1991]):

$$AR_{it} = b_{0t} + b_{1t}\,(X_{it} - X_{it-1})/P_{it-1} + b_{2t}X_{it}/P_{it-1} + u_{it} \qquad (1)$$

where AR_{it} is the abnormal return, X_{it} is earnings per share, P_{it-1} is the beginning-of-period share price, and i and t are firm and year subscripts.

The model in (1) can be derived given two assumptions. ($A1$) Abnormal returns are a linear function of unexpected earnings:

$$AR_{it} = a_{0t} + a_{1t}\,UE_{it}/P_{it-1} + u_{it},$$

where UE_{it} is unexpected earnings per share and the coefficient a_{1t} is the earnings response coefficient. ($A2$) Annual earnings follow an *IMA* (1,1) process:

$$X_{it} = X_{it-1} + UE_{it} - \Theta\ UE_{it-1}$$

where Θ is the moving average parameter.

If earnings follow an *IMA* (1,1) process, then unexpected earnings (deflated by price) can be expressed as:

$$UE_{it}/P_{it-1} = X_{it}/P_{it-1} - (1-\Theta)\ X_{it-1}/P_{it-1} - \Theta(1-\Theta)\ X_{it-2}/P_{it-1} - \dots \qquad (2)$$

When earnings are purely permanent, $\Theta = 0$ and the *IMA* (1,1) process is a random walk, so unexpected earnings are equal to the change in earnings, $(X_{it} - X_{it-1})/P_{it-1}$. When earnings are purely transitory, $\Theta = 1$, and unexpected earnings are equal to the level of earnings, X_{it}/P_{it-1}.

More generally, earnings contain both permanent and transitory components and Θ is between zero and one. The closer Θ is to zero, the more permanent is the *IMA* (1,1) process. For $0 < \Theta < 1$, the Easton and Harris model can be derived by truncating (2) at the first lag and rearranging terms to yield:

$$UE_{it}/P_{it-1} \approx (1-\Theta)\ (X_{it} - X_{it-1})/P_{it-1} + \Theta\ X_{it}/P_{it-1}. \qquad (3)$$

---

[4] Ohlson and Shroff [1992] point out that when the slope coefficient in a regression of current earnings on lagged earnings is greater (less) than .5, the change (level) variable has the better explanatory power for returns. Since this slope coefficient is greater the more permanent earnings are, their prediction is consistent with ours.

Thus, the level and change specification approximates unexpected earnings for the *IMA* (1,1) process for $0 < \Theta < 1$. For such a process, it can be shown that the weight on the change (level) variable decreases (increases) as Θ increases (although not linearly as represented in (3)).[5] Thus, if we use the change variable alone as a proxy for unexpected earnings, the more transitory earnings are, the greater the measurement error in the proxy.

Based on this analysis, we hypothesize that the incremental explanatory power and the increase in the *ERC* from including the earnings level variable depend on the permanence of the previous period's earnings, where the *ERC* is the sum of the coefficients on all the proxies for unexpected earnings (Brown et al. [1987]).[6] Specifically, if the previous period's earnings are predominantly permanent, then including the earnings level variable is not expected to increase the *ERC* and the explanatory power of the model. The opposite effect is expected, if the previous period's earnings are predominantly transitory.[7]

3. Research Design

We estimate (1) separately for firms whose previous period's earnings are likely to be either primarily transitory or primarily permanent. The *ERC*s and R^2s so obtained are compared with the coefficients and R^2s obtained by using the change and the level variables alone. We use beginning-of-period earnings–price ratios to measure the relative permanent versus transitory nature of a firm's previous period's earnings. As Beaver and Morse [1978] and Ou and Penman [1989] show, extremely high (low) earnings–price ratios indicate that earnings are transitorily high (low), and nonextreme earnings–price ratios indicate that earnings are predominantly permanent.

Following Ou and Penman [1989], we rank firms into ten groups each year by their beginning-of-year earnings–price ratios (X_{it-1}/P_{it-1}). We divide all firms with positive earnings into the first nine groups with an approximately equal number of firms per group. All firms with negative earnings are in group 10. We classify firms in the middle six

---

[5] Our analysis of the behavior of the level and change specification as a proxy for unexpected earnings for the *IMA* (1,1) model as Θ varies between zero and one indicates that as Θ increases, the relative weight (and the relative magnitude of the regression coefficient) on the change (level) variable decreases (increases) monotonically.

[6] Easton and Harris [1991] also link the inclusion of the earnings level variable to Brown et al.'s [1987] measurement error analysis.

[7] Our analysis also shows that since the level and change specification approximates unexpected earnings for an *IMA* (1,1) process for Θ between zero and one, the *ERC* estimates (calculated as the sum of the slope coefficients on the level and change variables) are less than the true *ERC*, but, consistent with Brown et al. [1987], the increase in the *ERC* and R^2 from the inclusion of the level variable (in addition to the change variable) increases as Θ goes from zero to one.

groups as predominantly permanent and firms in the bottom and top two groups as predominantly transitory.

The abnormal return of a firm is measured by subtracting from its returns the contemporaneous returns of a corresponding size-based portfolio. Size-based portfolios are obtained by classifying all firms on the *CRSP* daily file into deciles based on each year's beginning market value of equity. We compound the daily abnormal returns from April of year t through March of year $t + 1$.[8]

Earnings data are obtained from the annual *Compustat* file. Consistent with prior research, we use earnings before extraordinary items and discontinued operations (annual data item 58). Price and return data are obtained from the *CRSP* daily returns and master files for the 17 years 1969 to 1985.

4. Results

4.1 DESCRIPTIVE STATISTICS

Table 1 provides sample summary statistics. As evidence on the efficacy of our permanent versus transitory classification, we ran the following cross-sectional regression each year for each group, and we computed t-statistics by dividing the mean of the yearly coefficients (for each group) by the standard error of the mean (Fama and MacBeth [1973] methodology).

$$(X_{it} - X_{it-1})/P_{it-1} = C_{0t} + C_{1t}\,(X_{it-1} - X_{it-2})/P_{it-2} + e_{it} \qquad (4)$$

where X_{it} is earnings per share and P_{it-1} is the beginning-of-period share price.

The closer C_{1t} is to zero, the more permanent are earnings, since $C_{1t} = 0$ indicates that successive earnings changes are independent. The more transitory (i.e., mean-reverting) earnings are, the more negative C_{1t} is expected to be.[9] As the results in table 1 show, the mean C_{1t} for the transitory group is significantly negative, while for the permanent group it is not significantly different from zero at the 5% level (two-tailed test).

4.2 INCREASE IN EXPLANATORY POWER AND EARNINGS RESPONSE COEFFICIENTS FROM INCLUDING THE EARNINGS LEVEL VARIABLE

Consistent with prior research, we estimate (1) separately for each sample year.[10] Also, like Easton and Harris, we conduct pooled time-series cross-sectional regressions. The means of the yearly regression

[8] Tests using raw returns yield quite similar results. Easton and Harris [1991] also use both raw and abnormal returns.

[9] Easton and Zmijewski [1989] and Penman [1992] use this test. These authors refer to the slope coefficient in equation (4) as the coefficient relating current earnings to future earnings.

[10] For example, all 19 studies cited by Lev [1989, table 1] estimate the earnings–returns model cross-sectionally.

TABLE 1

Descriptive Statistics of Firms with Permanent and Transitory Earnings, 1969–85

	Transitory Group[a]	Permanent Group[a]
No. of Observations	4355	7219
Mean $\hat{C}_{1t}$[b]	-0.29	0.07
$t(\hat{C}_{1t})$	-3.8	1.6
Number of Times Out of 16 Years		
$\hat{C}_{1t} < 0$	14	5
AR_{it}[c]		
Mean	-0.047	-0.036
Standard Deviation	0.401	0.332
$(X_{it} - X_{it-1})/P_{it-1}$		
Mean	0.019	0.004
Standard Deviation	0.218	0.075
(X_{it}/P_{it-1})		
Mean	0.077	0.109
Standard Deviation	0.307	0.089

[a]We rank firms into groups each year by their beginning-of-year earnings–price ratios (X_{it-1}/P_{it-1}). We divide all firms with positive earnings into the first nine groups, with an (approximately) equal number of firms per group. All firms with negative earnings are in group 10. We classify firms in the middle six groups as predominantly permanent and firms in the bottom two and top two groups as predominantly transitory.

[b]The following regression is carried out year by year for firms in each of the groups:

$$(X_{it} - X_{it-1})/P_{it-1} = C_{0t} + C_{1t}(X_{it-1} - X_{it-2})/P_{it-2} + e_{it}$$

where X and P stand for earnings per share and price per share, respectively, and i and t are firm and year subscripts. Both the dependent and independent variables are truncated at ±100%. The mean values of $\hat{C}_{1t}$ over 16 years (1970–85) are reported above. 1969 is dropped because one additional lag of earnings is required to carry out this test.

[c]AR_{it} is the annual abnormal stock return from April to March.

coefficients and the adjusted R^2s are reported in table 2. The reported t-statistics for the yearly regressions are computed using the methodology of Fama and MacBeth [1973], as described above. Table 3 reports the pooled results.

Panels A and B of table 2 show the results of estimating earnings–returns models for the permanent and transitory groups, respectively. Model 1 is the earnings–returns model with both the earnings change and level variables, and model 2 is the earnings–returns model with the earnings change variable alone. A comparison of the mean adjusted R^2s for models 1 and 2 shows that for the transitory group, the R^2 increases by 74% (.153 versus .088) when the earnings level variable is included. For the permanent group, the R^2s for models 1 and 2 are 0.193 and 0.175, respectively, a 10% increase.

The estimated *ERC*s, calculated by summing the coefficients b_1 and b_2 on the change and level variables, are 2.72 and 1.07 for the permanent and transitory groups, respectively (see model 1 of panels A and B in table 2). Model 2 shows that when only the earnings change variable is used as a regressor, the estimated *ERC*s are 2.73 and 0.69 for the two groups, respectively. While for the permanent group the proportional underestimation of *ERC* $[(b_1 + b_2 - b'_1)/(b_1 + b_2)]$ is -0.004 (t-statistic =

TABLE 2

Results of Regressions of Abnormal Returns against Earnings Levels and Changes, 1969–85[a]

Model 1: $AR_{it} = b_{0t} + b_{1t}(X_{it} - X_{it-1})/P_{it-1} + b_{2t}X_{it}/P_{it-1} + u_{it}$

Model 2: $AR_{it} = b'_{0t} + b'_{1t}(X_{it} - X_{it-1})/P_{it-1} + u'_{it}$

Model 3: $AR_{it} = b''_{0t} + b''_{2t}X_{it}/P_{it-1} + u''_{it}$

	Intercept	$(X_{it} - X_{it-1})/P_{it-1}$	X_{it}/P_{it-1}	Adjusted R^2
Panel A: Firms with Predominantly Permanent Component in Previous Period's Earnings[b]				
Model 1	−0.11	1.99	0.73	.193
	(−3.8)	(2.8)	(1.9)	
Model 2	−0.04	2.73		.175
	(−3.4)	(6.0)		
Model 3	−0.24		2.25	.162
	(−9.6)		(8.1)	
		$(b_1 + b_2 - b'_1)/(b_1 + b_2) = -0.004$ (−1.4)		
Panel B: Firms with Predominantly Transitory Component in Previous Period's Earnings[b]				
Model 1	−0.09	0.59	0.48	.153
	(−7.5)	(3.9)	(5.5)	
Model 2	−0.05	0.69		.088
	(−4.9)	(6.4)		
Model 3	−0.10		0.73	.116
	(−7.1)		(4.9)	
		$(b_1 + b_2 - b'_1)/(b_1 + b_2) = 0.355$ (3.0)		

[a]Ordinary least square estimates are obtained from cross-sectional regressions carried out for each of the years, 1969 to 1985. The mean of the 17 annual coefficients and adjusted R^2s are reported above. The numbers in parentheses are *t*-statistics which are obtained by dividing the mean value of the coefficients by the standard error of the mean of the coefficients.

AR_{it} is the annual abnormal stock return from April to March, X_{it} is the earnings excluding extraordinary items and discontinued operations (*Compustat* annual data item 58), and P_{it-1} is the stock price at the beginning of a period (April 1).

[b]We rank firms into ten groups each year by their beginning-of-year earnings–price ratios (X_{it-1}/P_{it-1}). We divide all firms with positive earnings into the first nine groups, with an (approximately) equal number of firms per group. All firms with negative earnings are in group 10. We classify firms in the middle six groups as predominantly permanent and firms in the bottom two and top two groups as predominantly transitory.

−1.4), for the transitory group the proportional underestimation is 0.355 (*t*-statistic = 3.0).[11]

Furthermore, for the transitory group, the sum of the earnings level and change coefficients in model 1 is greater than the earnings change coefficient in model 2 in 14 of 17 years. Assuming a 50% probability that the sum of the coefficients is greater than the change coefficient in any year, the binomial probability of this occurring is 0.005. For the permanent group, the sum of the slope coefficients is greater in 7 out of 17 years for a binomial probability of 0.15.

[11] Comparing models 1 and 3 in table 2 also shows that, like Easton and Harris [1991], we find that when only the earnings level variable is included, the adjusted R^2s and the *ERCs* are lower than when both the earnings level and change are used as regressors.

TABLE 3

Results of Pooled Time-Series Cross-Sectional Regressions of Abnormal Returns against Earnings Levels and Changes, 1969–85[a]

Model 1: $AR_{it} = b_{0t} + b_{1t}(X_{it} - X_{it-1})/P_{it-1} + b_{2t}X_{it}/P_{it-1} + u_{it}$

Model 2: $AR_{it} = b'_{0t} + b'_{1t}(X_{it} - X_{it-1})/P_{it-1} + u'_{it}$

Model 3: $AR_{it} = b''_{0t} + b''_{2t}X_{it}/P_{it-1} + u''_{it}$

	Intercept	$(X_{it} - X_{it-1})/P_{it-1}$	X_{it}/P_{it-1}	Adjusted R^2
Panel A: Firms with Predominantly Permanent Component in Previous Period's Earnings[b]				
Model 1	−0.01	2.01	−0.31	.141
	(−1.0)	(20.6)	(−3.8)	
Model 2	−0.04	1.69		.139
	(−11.6)	(35.3)		
Model 3	−0.16		1.16	.094
	(27.6)		(28.2)	
		$(b_1 + b_2 - b'_1)/(b_1 + b_2) = 0.006$		
Panel B: Firms with Predominantly Transitory Component in Previous Period's Earnings[b]				
Model 1	−0.07	0.37	0.27	.110
	(−13.0)	(13.2)	(13.5)	
Model 2	−0.06	0.51		.075
	(−9.9)	(19.5)		
Model 3	−0.07		0.37	.077
	(−12.9)		(19.7)	
		$(b_1 + b_2 - b'_1)/(b_1 + b_2) = 0.203$		

[a]Ordinary least square estimates are obtained from pooled time-series cross-sectional regressions. The numbers in the parentheses are *t*-statistics.

AR_{it} is the annual abnormal stock return from April to March, X_{it} is the earnings excluding extraordinary items and discontinued operations (*Compustat* annual data item 58), and P_{it-1} is the stock price at the beginning of a period (April 1).

[b]We rank firms into ten groups each year by their beginning-of-year earnings–price ratios (X_{it-1}/P_{it-1}). We divide all firms with positive earnings into the first nine groups, with an (approximately) equal number of firms per group. All firms with negative earnings are in group 10. We classify firms in the middle six groups as predominantly permanent and firms in the bottom two and top two groups as predominantly transitory.

For the pooled results in table 3, a comparison of the adjusted R^2s for models 1 and 2 shows that for the transitory group, the R^2 increases by 47% (.110 versus .075) when the earnings level variable is included as a regressor. For the permanent group, the R^2s for models 1 and 2 are 0.141 and 0.139, respectively, a 1.4% increase. The estimated pooled *ERC*s are 1.70 and 0.64 for the permanent and transitory groups, respectively (see model 1 of panels A and B in table 3). Model 2 shows that when only the earnings change variable is used as a regressor, the estimated *ERC*s are 1.69 and 0.51 for the two groups. For the permanent group, the proportional underestimation of *ERC* $[(b_1 + b_2 - b'_1)/(b_1 + b_2)]$ is 0.006; for the transitory group, the proportional underestimation is 0.203.

The result that the increase in the R^2 and estimated *ERC* from including the earnings level variable is greater for firms whose previous period's earnings are predominantly transitory (as proxied by the *E/P* ratio) suggests that one potential reason for the low R^2s and low estimated

ERCs in earnings–returns studies is measurement error in the earnings change as a proxy for unexpected earnings.[12] Including earnings levels, however, leads to *ERCs* that are still lower than expected if earnings follow a random walk (see n. 3). This is not surprising, because our evidence suggests that annual earnings have transitory components. Earnings response coefficients, therefore, are not expected to approach their hypothetical random walk values even if unexpected earnings are measured without error. Furthermore, as shown in section 2, if annual earnings follow an *IMA* (1,1) process, then the level and change specification is only an approximation to the true unexpected earnings. Thus, it is likely that there still exists some measurement error bias in *ERC* estimates from the level and change specification (see n. 7).

Since we group firms based on *E/P* ratios, the differential incremental explanatory power of the earnings level variable might be due to the presence of a differential Basu effect between our groups (see Easton and Harris [1991] and Ramesh and Thiagarajan [1991]). To examine this possibility, we estimated (5) for each of our groups for each year:

$$AR_{it} = d_{0t} + d_{1t}\, X_{it-1}/P_{it-1} + w_{it}. \tag{5}$$

The average slope coefficient and R^2 are .17 and .017 for the transitory group and 0.73 and .020 for the permanent group. If our earlier results were driven by the Basu effect, we would expect both the slope coefficient and the R^2 in (5) to be higher for the transitory group (because the earnings level variable increases the *ERC* and R^2 for that group). Since the slope coefficient is higher for the permanent group and since the R^2s are virtually identical, we conclude that the Basu effect is not driving our results.[13]

5. *Conclusions*

Easton and Harris [1991] show that both earnings changes and levels (deflated by beginning-of-period stock price) have explanatory power when they are included simultaneously in a regression model of abnormal returns on earnings. By assuming that annual earnings follow an *IMA* (1,1) process, we show that the earnings level variable can enter the earnings–returns model because of transitory components in the previous period's earnings. The more transitory the previous period's

---

[12] When we used Ou and Penman's [1989] *Pr* measure to classify firms into permanent and transitory groups, the increase in the *ERC* and R^2 was greater for the predominantly transitory group than for the predominantly permanent group. The similarity of the results based on the *E/P* and *Pr* classifications is not surprising, because Ou and Penman [1989] show that *Pr* and *E/P* provide similar signals of earnings permanence. The tests were also repeated using earnings including extraordinary items and discontinued operations (*Compustat* annual data item 53) with results similar to those reported in tables 2 and 3.

[13] Ohlson and Shroff [1992] also confirm this result.

earnings are, the greater the expected incremental explanatory power and the increase in the *ERC* from inclusion of the level variable, where the *ERC* is the sum of the coefficients on the level and change variables. Our results are consistent with these predictions.

Our finding that including the earnings level variable as a regressor materially increases both the explanatory power and the *ERC* suggests that measurement error in unexpected earnings, from assuming that annual earnings follow a random walk, is partially responsible for the low R^2s and *ERC*s of annual unexpected earnings–abnormal returns studies.

REFERENCES

ALBRECHT, W. S.; L. L. LOOKABILL; AND J. C. MCKEOWN. "The Time Series Properties of Annual Earnings." *Journal of Accounting Research* 15 (Autumn 1977): 226–44.

BALL, R., AND R. WATTS. "Some Time Series Properties of Accounting Income." *Journal of Finance* (June 1972): 663–81.

BASU, S. "Investment Performance of Common Stocks in Relation to Their Price–Earnings Ratio: A Test of the Efficient Market Hypothesis." *Journal of Finance* (June 1977): 663–82.

BEAVER, W., AND D. MORSE. "What Determines Earnings Price Ratios?" *Financial Analysts Journal* (July/August 1978): 65–76.

BEAVER, W.; P. A. GRIFFIN; AND W. R. LANDSMAN. "The Incremental Information Content of Replacement Cost Earnings." *Journal of Accounting and Economics* (July 1982): 15–40.

BEAVER, W.; R. LAMBERT; AND D. MORSE. "The Information Content of Security Prices." *Journal of Accounting and Economics* (March 1980): 3–28.

BOWEN, R. M.; D. BURGSTAHLER; AND L. DALEY. "The Incremental Information Content of Accrual versus Cash Flow." *The Accounting Review* (October 1987): 723–47.

BROOKS, L. D., AND D. A. BUCKMASTER. "Further Evidence of the Time-Series Properties of Accounting Income." *Journal of Finance* 31 (1976): 1359–73.

BROWN, L. D.; R. L. HAGERMAN; P. A. GRIFFIN; AND M. E. ZMIJEWSKI. "An Evaluation of Alternative Proxies for the Market's Assessment of Unexpected Earnings." *Journal of Accounting and Economics* 9 (1987): 159–93.

COLLINS, D. W., AND S. P. KOTHARI. "A Theoretical and Empirical Analysis of the Determinants of Earnings Response Coefficients." *Journal of Accounting and Economics* 11 (1989): 143–81.

EASTON, P. D., AND T. S. HARRIS. "Empirical Evidence on the Relevance of Earnings and Book Value of Owners' Equity in Security Valuation." Working paper, Columbia University, 1990.

———. "Earnings as an Explanatory Variable for Returns." *Journal of Accounting Research* 29 (Spring 1991): 19–36.

EASTON, P. D., AND M. ZMIJEWSKI. "Cross-Sectional Variation in the Stock Market Response to the Announcement of Accounting Earnings." *Journal of Accounting and Economics* (1989): 117–41.

———. "On the Estimation of Earning Response Coefficients." Working paper, University of Chicago, 1991.

FAMA, E. F., AND J. D. MACBETH. "Risk Return and Equilibrium: Empirical Tests." *Journal of Political Economy* 71 (May/June 1973): 607–36.

KORMENDI, R., AND R. LIPE. "Earnings Innovations, Earnings Persistence, and Stock Returns." *Journal of Business* 60, no. 3 (1987): 323–45.

LEV, B. "On the Usefulness of Earnings: Lessons and Directions from Two Decades of Empirical Research." *Journal of Accounting Research* (Supplement 1989): 153–92.

LIVNAT, J., AND P. ZAROWIN. "The Incremental Information Content of Cash Flow Components." *Journal of Accounting and Economics* (May 1990): 25–46.

LUSTGARTEN, S. "The Impact of Replacement Cost Disclosures on Security Prices." *Journal of Accounting and Economics* (October 1982): 121–41.

OHLSON, J. A. "Accounting Earnings, Book Value, and Dividends: The Theory of the Clean Surplus Equation (Part I)." Working paper, Columbia University, 1989.

OHLSON, J. A., AND P. K. SHROFF. "Changes versus Levels in Earnings as Explanatory Variables for Returns: Some Theoretical Considerations." *Journal of Accounting Research* (Autumn 1992): 210–26.

OU, J. A., AND S. H. PENMAN. "Accounting Measurement, Price–Earnings Ratio, and the Information Content of Security Prices." *Journal of Accounting Research* (Supplement 1989): 111–52.

PENMAN, S. H. "Financial Statement Information and the Pricing of Earnings Changes." *The Accounting Review* 67 (1992): 563–77.

RAMESH, K., AND S. R. THIAGARAJAN. "Value Relevance of Earnings Level." Working paper, Northwestern University, 1991.

WATTS, R., AND R. W. LEFTWICH. "The Time Series of Annual Accounting Earnings." *Journal of Accounting Research* 15 (Autumn 1977): 253–71.