Sustained Earnings and Revenue Growth, Earnings Quality, and Earnings Response Coefficients

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Abstract. We show that firms reporting sustained increases in both earnings and revenues have (1) higher quality earnings and (2) larger earnings response coefficients (ERCs) in comparison to firms reporting sustained increases in earnings alone. With respect to earnings quality, firms with revenue-supported increases in earnings have more persistent earnings, exhibit less susceptibility to earnings management, and have higher future operating performance. With respect to response coefficients, firms with revenue-supported increases in earnings have both higher ERCs and lower book value response coefficients, consistent with the implications of the Ohlson (1995) model.

Key words: earnings growth; revenue growth; earnings quality; earnings response coefficients

JEL Classification: G12, M41.

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In this paper, we explore the effects of sustained increases in earnings concurrent with sustained increases in revenues on the quality of earnings and earnings response coefficients (ERCs). Prior research demonstrates that firms with sustained increases in earnings have higher ERCs than other firms (Barth, Elliott and Finn, 1999).[1] However, similar patterns of earnings increases across firms need not signal similar information because earnings increases could emanate from different components of earnings. In a short-window event study context, revenues and expenses, the two major components of earnings, have been shown to be differentially informative (Ertimur, Livnat and Martikainen, 2003). However, the valuation effects of sustained increases in earnings attained through revenue increases vis-à-vis cost reductions are not yet known. To understand these effects, we partition firms with sustained increases in earnings into two groups: firms that report sustained increases in earnings along with sustained increases in revenues and firms that do not report sustained increases in revenues. We hypothesize that for firms that report sustained increases in earnings along with sustained increases in revenues, (1) earnings are of higher quality and (2) ERCs are larger in comparison with the earnings of firms that show sustained increases in earnings but not in revenues.

Several arguments in the literature lead to the first hypothesis. Although quality of earnings is a nebulous concept, persistence of earnings and earnings management are amongst the most frequently used measures of earnings quality (e.g., Dechow and Dichev, 2002). The competitive strategy literature (Porter, 1980, 1985) argues that firms pursuing a revenue-growth strategy are different from those following a cost-reduction strategy and that revenue-supported earnings growth is likely to be more sustainable than earnings growth supported through cost reductions. This suggests that persistence of earnings is higher when earnings growth is supported by revenue growth. Also, revenues are generally thought to be more difficult to manage than expenses (Ertimur et al., 2003). We follow prior literature (e.g., Jones, 1991; Dechow et al., 1995; Bartov, 1993; Bens et al., 2003) to identify several specific

approaches that are often related to earnings management. In particular, we examine accounting accruals, special items and share repurchases as alternative measures of earnings management. We expect that firms with revenue-supported sustained increases in earnings are less likely to use these approaches to increase reported earnings. In addition, sustainable earnings growth is likely to be positively associated with future performance. Hence, we also examine future operating performance and analysts' long-term earnings growth forecasts across various groups.

The second hypothesis follows from the results in prior research (Barth et al., 1999; Ertimur et al., 2003) and our first hypothesis on the quality of earnings. Since the ultimate test of earnings quality is the market's valuation of earnings, we expect differences in earnings quality to be associated with different valuation weights on earnings. In particular, we expect firms with revenue-supported sustained increases in earnings to have higher ERCs than firms with non-revenue-supported increases in earnings. To test our hypothesis, we use the Ohlson (1995) model that relates stock prices to earnings and book value. Ohlson (1995) points out that his model can be interpreted as a weighted average model of earnings and book value-based valuation models. Higher earnings persistence should lead to higher weight on earnings and lower weight on book value. Given that we expect firms with revenue-supported increases in earnings to have higher ERCs, we also expect them to have lower book value response coefficients (BVRCs).

We further extend our analysis to examine the effect of sustained increases in operating earnings in addition to sustained increases in revenues. If operating earnings are not increasing, firms are forced to resort to using non-operating items to achieve the earnings increases. Such increases in earnings are likely to be more transitory and less valuable. Thus, we hypothesize that firms with sustained increases in both revenues and operating earnings have the highest earnings quality and ERCs.

Our sample is based on all available firms on Compustat from 1980 to 2000. Following Barth et al. (1999), we define sustained increases as increases for five consecutive years. About two thirds of the firms with sustained increases in earnings also have concurrent sustained increases in revenues. We regard the remaining one third as cost-reduction firms because they *must* have adopted a cost-cutting strategy in some of the years to maintain sustained increases in earnings. With respect to the first

hypothesis, our results are consistent with the predicted differences in the quality of earnings. Relative to cost-reduction firms, firms with sustained increases in revenues have significantly higher earnings persistence and are less likely to manage earnings. These firms also have higher long-term earnings growth forecasts, higher future return on assets, and are more likely to continue their string of earnings increases in the subsequent year.

Our evidence also supports the second hypothesis. We find that, on average, the ERCs for the revenue-growth firms are higher. Furthermore, consistent with the implications of the Ohlson model, the higher ERCs for the revenue-growth firms are accompanied by lower BVRCs. Finally, we find that earnings quality and ERCs are the highest when sustained increases in earnings are supported by sustained increases in both revenues and operating earnings.

The rest of the paper is organized as follows. In Section 1, we develop our hypotheses beyond what is presented in this introduction. Section 2 outlines the research design and Section 3 describes the sample selection and summary statistics. Section 4 reports the results. The final section provides a summary with our concluding remarks.

1. Sources of Earnings Growth and Predictions

Barth et al. (1999) show that ERCs are higher for firms reporting sustained increases in earnings than for other firms, suggesting that the path of growth in earnings is value relevant. Their results are consistent with the argument that a string of earnings increases signals a firm's competitive advantage and a higher likelihood of future earnings growth (Eccles et al., 2001). Smoothly growing earnings can also signal hard-working managers since the discretion to smooth earnings can be used to induce managers to exert a higher level of effort relative to shirking (Demski, 1998).

While Barth et al. (1999) study sustained increases in earnings, they do not distinguish among the alternative sources of growth in earnings. Sustained increases in earnings can be achieved through different components of earnings, which can provide incremental information beyond what is contained in the overall growth pattern. Since earnings are the net of revenues and costs, we consider two broad

strategies to achieve sustained increases in earnings: a revenue-increasing strategy and a cost-reduction strategy. Both academics and practitioners recognize that revenue is the key value driver (Penman, 2004, p. 402; Lundholm and Sloan, 2004, p. 144; Holliday, 2000; *Wall Street Journal*, C1, Sept. 25, 2000). A number of arguments suggest that sustained earnings growth from a revenue-growth strategy leads to higher earnings quality and is valued more by the market than sustained earnings growth from a cost-cutting strategy.

The competitive strategy literature (Porter 1980, 1985) argues that product differentiation is achieved through primary operations and a growing demand for the firms' products. Firms pursuing this strategy are able to retain their competitive advantage in the long run and can charge a premium for their products because it is difficult for competing firms to emulate their strategy. The success of the strategy is manifested through sustained earnings growth together with sustained revenue growth. On the other hand, it is relatively easy for competitors to emulate the strategy of "cost-leaders" by cutting costs in a similar manner (such as pension plans or healthcare costs).[2] Moreover, while revenue increases have unlimited potential, cost reductions have a lower bound beyond which it is difficult to cut costs without adversely affecting core operations. Costs are also "sticky" in that they increase faster than they decrease when the activity levels change (Anderson et al., 2003), making it difficult to maintain continuous cost reductions. Finally, cost reductions are often "reactive" while revenue growth strategies are typically "proactive." Troubled firms often react to financial distress by utilizing cost cutting as a short-term remedy rather than a long-run solution. One concern with cost cutting programs is that firms are likely to lose the "muscle" while cutting the "fat," thus hurting the profitability in the long run.[3]

Earnings growth, however, can also be achieved through earnings management (e.g., Burgstahler and Dichev, 1997). Opportunistic earnings management is more likely to be of concern for short-term earnings growth, but it is less of concern for *sustained* earnings growth because of the conservation of earnings in the long run (Sunder, 1998). This is because upwardly managed portions in earnings have to be reversed in subsequent periods. More specific to the two sources of earnings growth that we examine, managing revenue growth is likely to be more difficult than managing cost reductions (Ertimur et al.,

2003). Several revenue-boosting techniques such as inventory stuffing, bill and hold, and early buy-back are generally GAAP violations, often require external party's cooperation, and are subject to more stringent scrutiny by auditors and the SEC. Typically, revenues recognized prematurely have to be reversed in the near future. On the other hand, managing costs such as bad debt or restructuring charges is an internal matter and is often done within GAAP, making detection more difficult. Managers also have more flexibility in the timing of the reversal of the cost-related accruals.[4]

Based on the above arguments, we predict that earnings growth supported by revenue growth is of higher quality than earnings growth supported by cost reductions. This will be reflected in several earnings attributes. In particular, we predict that revenue-growth firms have higher earnings persistence, higher future operating performance, and less earnings management than cost-reduction firms. Since these earnings attributes are value-relevant fundamentals that are likely to affect how earnings are valued by the market (Lipe, 1986; Kormendi and Lipe, 1987; Penman, 1992; Warfield, Wild and Wild, 1995), we predict that earnings of firms with revenue-supported earnings growth have higher ERCs.

2. Research Design

2.1. Grouping of Firms with Sustained Earnings Growth

Figure 1 illustrates our classification of firms with sustained earnings growth into various groups. For fiscal year *t*, we start from all available firms and form group G_t which is composed of firms with five consecutive years of earnings per share increases up to year *t*. That is, for group G_t, $EPS_\tau - EPS_{\tau-1}$ is greater than zero for τ = t-4 to t. Within group G_t, group S_t (sales or revenues) consists of firms with five years of consecutive revenue per share increases up to year *t*. The remaining firms in group G_t are classified as group NS_t (not sales).

In the remainder of the text, we omit the year subscript *t* for the various groups for brevity. Since few firms have consecutive years of total cost decreases, we consider group NS as our set of cost-reduction firms without imposing sustained cost reductions as the criterion. The reasoning is that all firms in the NS group must have experienced one or more years of sales decreases over the five prior

years. Therefore, even though the NS firms do not necessarily reduce costs every year, they *must* have decreased costs by more than the sales decreases in some years in order to maintain earnings growth.[5] Note that some firms following a cost-reduction strategy could fall in group S because they happen to have consecutive revenue increases due to favorable market and industry conditions or economies of scale or scope. Similarly, some firms following a revenue-growth strategy may, by chance, fall into group NS. However, such misclassifications would bias the results against our hypotheses.

To separately consider the effects of operating and non-operating items on earnings quality and the valuation of earnings, we form group SO (sales and operating earnings) by picking from group S those firms that had five years of operating earnings per share increases up to year *t*. The remaining firms from group S comprise group SNO (sales but not operating earnings). Similarly, within group NS, we identify firms with five years of operating earnings increases to form group NSO (not sales but operating earnings) and the remaining firms to form group NSNO (not sales and not operating earnings). For firms in groups SNO and NSNO, operating earnings decrease in one or more years, with operating costs either increasing by more than sales increases (group SNO) or decreasing less than sales decreases (group NSNO). Therefore, firms in groups SNO and NSNO fail to control operating costs and *have to* resort to reducing non-operating costs or recognizing non-operating gains to maintain earnings increases. Given the transitory nature of non-operating items, we expect earnings to be of lower quality and the associated pricing (ERCs) to be lower for these two groups than for groups SO and NSO. Due to a first-order sales effect, we expect groups SO and SNO to dominate groups NSO and NSNO, respectively.

2.2. Tests on Earnings Quality: Earnings Management, Future Operating Performance, and Earnings Persistence

Our tests of earnings management and future operating performance are relatively straightforward. For the tests of earnings management, we examine total accruals, working capital accruals, and abnormal accruals, as well as special items and share repurchases. For the tests of future operating performance, we examine analysts' long-term earnings growth forecasts, realized future return

on assets, and the frequency of firms that continue to have earnings increases. These various measures are aggregated for each group and compared across the groups. For the tests of earnings persistence, we use more specific models. Following Freeman, Ohlson and Penman (1982), the first set of models are given by (1a) and (1b):

$$E_{t+1}/P_t = b_0 + b_1 E_t^-/P_{t-1} + b_2 E_t^+/P_{t-1} + b_3 E_t/P_{t-1} \times D_t^S + b_4 E_t/P_{t-1} \times D_t^{NS} + \varepsilon_{t+1} \quad (1a)$$

$$E_{t+1}/P_t = b_0 + b_1 E_t^-/P_{t-1} + b_2 E_t^+/P_{t-1} + b_{31} E_t/P_{t-1} \times D_t^{SO} + b_{32} E_t/P_{t-1} \times D_t^{SNO} + b_{41} E_t/P_{t-1} \times D_t^{NSO} + b_{42} E_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_{t+1} \quad (1b)$$

where for the fiscal year indicated by the subscript, E is earnings per share, E^- and E^+ are negative and non-negative measures of E (losses and profits), P is the stock price at the end of the third month after the fiscal year-end, and Ds are dummy variables for firms in groups S, NS, SO, SNO, NSO or NSNO indicated by the superscripts. Model (1a) examines the two broad groups S and NS, and Model (1b) examines the finer groups SO, SNO, NSO and NSNO. We allow different persistence parameters on profits and losses because losses are likely to be more transitory due to the abandonment option (Hayn, 1995). Since nearly all firms in the various earnings growth groups have positive earnings after five or more years of sustained increases in earnings, their incremental persistence parameters are relative to the benchmark of positive earnings in general.[6]

While Models (1a) and (1b) examine the persistence of earnings levels, Dechow, Kothari and Watts (1998) show that earnings changes are on average negatively serially correlated, suggesting that the earnings process is mean reverting. Our second set of models, (2a) and (2b), directly examines the persistence of earnings growth. We expect that earnings growth is less likely to reverse when it is sustained through revenue increases.

$$\Delta E_{t+1}/P_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_3 \Delta E_t/P_{t-1} \times D_t^S + b_4 \Delta E_t/P_{t-1} \times D_t^{NS} + \varepsilon_{t+1} \quad (2a)$$

$$\Delta E_{t+1}/P_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_{31} \Delta E_t/P_{t-1} \times D_t^{SO} + b_{32} \Delta E_t/P_{t-1} \times D_t^{SNO} + b_{41} \Delta E_t/P_{t-1} \times D_t^{NSO} + b_{42} \Delta E_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_{t+1} \quad (2b)$$

where Δ is the first-difference operator and ΔE^- and ΔE^+ are positive and negative earnings changes. Elgers and Lo (1994) show that negative earnings changes tend to reverse more in the next period than

positive earnings changes. Since earnings growth by definition is a positive earnings change, the various groups we examine are strictly subsets of firms with ΔE_t^+.

In the above models, b_1 and b_2 capture the earnings persistence of negative and positive earnings/ earnings changes for average firms without sustained earnings growth. Our interest is in the incremental earnings persistence parameters for firms that sustain earnings growth through various sources: b_i, $i \geq 3$. For Models (1a) and (2a) where the comparison is between groups S and NS, we expect $b_3 > b_4 > 0$. That is, the incremental persistence parameters are higher when earnings growth is sustained through revenue increases. For Models (1b) and (2b) where both revenues and operating earnings are considered, we expect $b_{31} > b_{41} > 0$ and $b_{32} > b_{42} > 0$. That is, within firms with sustained operating earnings increases (SO and NSO) and those without (SNO and NSNO), the incremental earnings persistence parameters are higher when firms have revenue-supported earnings growth. We also expect $b_{31} > b_{32} > 0$ and $b_{41} > b_{42} > 0$. That is, within the revenue-growth and cost-reduction groups, those with sustained operating earnings growth dominate those without.

2.3. Tests on Earnings Response Coefficients (ERCs)

Pricing of earnings requires the specification of particular valuation models. Following prior studies (e.g., Barth et al., 1999), we use variations of the Ohlson (1995) model that relates stock prices to earnings and book value. Although our focus is on comparing the response coefficients on earnings (ERCs), Ohlson (1995) points out that one implication of his valuation model is that a higher weight on earnings corresponds to a lower weight on book value. Empirical studies show that the relative weight on book value is low (high) when earnings levels are high (low) (Collins, Pincus and Xie, 1998; Burgstahler and Dichev, 1997; Chen and Zhang, 2002). Following these studies, we separate earnings and earnings changes into positive and negative measures. This is also consistent with the previous persistence tests. We allow the response coefficients for both earnings and book value to vary among firms with positive and negative earnings/earnings changes, and among the various earnings growth groups. Our first specification is based on the price levels models given by (3a) and (3b).

$$P_t = b_0 + b_1 E_t^- + b_2 E_t^+ + b_3 E_t \times D_t^S + b_4 E_t \times D_t^{NS} + c_1 BV_t \times D_t^{E-} + c_2 BV_t \times D_t^{E+} + c_3 BV_t \times D_t^S + c_4 BV_t \times D_t^{NS} + \varepsilon_t \quad (3a)$$

$$P_t = b_0 + b_1 E_t^- + b_2 E_t^+ + b_{31} E_t \times D_t^{SO} + b_{32} E_t \times D_t^{SNO} + b_{41} E_t \times D_t^{NSO} + b_{42} E_t \times D_t^{NSNO} + c_1 BV_t \times D_t^{E-} + c_2 BV_t \times D_t^{E+} + c_{31} BV_t \times D_t^{SO} + c_{32} BV_t \times D_t^{SNO} + c_{41} BV_t \times D_t^{NSO} + c_{42} BV_t \times D_t^{NSNO} + \varepsilon_t \quad (3b)$$

where BV is book value per share and D^{E-} and D^{E+} are dummy variables for $E < 0$ and $E \geq 0$. We measure stock prices P_t three months after the end of fiscal year t to ensure that accounting information is available to the market for valuation purposes.

Our second specification is the returns models given by (4a) and (4b).

$$Ret_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_3 \Delta E_t/P_{t-1} \times D_t^S + b_4 \Delta E_t/P_{t-1} \times D_t^{NS} + c_1 BV_t/P_{t-1} \times D_t^{\Delta E-} + c_2 BV_t/P_{t-1} \times D_t^{\Delta E+} + c_3 \Delta BV_t/P_{t-1} \times D_t^S + c_4 \Delta BV_t/P_{t-1} \times D_t^{NS} + \varepsilon_t \quad (4a)$$

$$Ret_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_{31} \Delta E_t/P_{t-1} \times D_t^{SO} + b_{32} \Delta E_t/P_{t-1} \times D_t^{SNO} + b_{41} \Delta E_t/P_{t-1} \times D_t^{NSO} + b_{42} \Delta E_t/P_{t-1} \times D_t^{NSNO} + c_1 \Delta BV_t/P_{t-1} \times D_t^{\Delta E-} + c_2 \Delta BV_t/P_{t-1} \times D_t^{\Delta E+} + c_{31} \Delta BV_t/P_{t-1} \times D_t^{SO} + c_{32} \Delta BV_t/P_{t-1} \times D_t^{SNO} + c_{41} \Delta BV_t/P_{t-1} \times D_t^{NSO} + c_{42} \Delta BV_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_t \quad (4b)$$

where Ret_t is the compounded stock return from the fourth month of fiscal year t to the third month after the year-end, and $D^{\Delta E-}$ and $D^{\Delta E+}$ are dummy variables for $\Delta E < 0$ and $\Delta E \geq 0$.

We use both the price levels models and the returns models because together they provide a complimentary set of results (Barth, Beaver and Landsman, 2001; Gu 2004). The coefficients of the two models often differ significantly (Kothari and Zimmerman, 1995) and hence the returns models need not merely be the first-differenced versions of the (deflated) levels models. Thus, it is important to verify the results from the levels models by using the returns models. In addition, while valuation takes a measurement perspective, the returns models can also be justified from an information perspective. If ΔE is considered as a proxy for earnings surprises, then the returns models are the traditional long-window earnings-returns relations measuring the informativeness of earnings.

Similar to the prediction for Model (1a), our prediction for Models (3a) and (4a) is $b_3 > b_4 > 0$. That is, ERCs are higher when earnings growth is sustained through revenue increases rather than through cost reductions. Similar to the prediction for Model (1b), our prediction for Models (3b) and (4b) is $b_{31} > b_{41} > 0$ and $b_{32} > b_{42} > 0$. That is, for the groups with sustained operating earnings increases and the

groups without these increases, ERCs are always higher when earnings growth and revenue growth are sustained concurrently. We also predict $b_{31} > b_{32} > 0$ and $b_{41} > b_{42} > 0$. That is, within the revenue increase and non-revenue increase groups, ERCs are higher when operating earnings increases are sustained. In contrast, we expect the book value response coefficients (BVRC) to be correspondingly lower when the ERCs are higher.

3. Sample and Descriptive Statistics

3.1. Sample Selection and Variable Measurement

Our initial sample consists of all firms covered on Compustat, active and inactive, from 1980 through 2000. Strings of variables are calculated starting from 1975 to ensure that a firm with five or more years of earnings increases has a long enough prior earnings history by 1980. A firm is included only if it has at least five consecutive years of accounting data. This allows the calculation of sustained growth and also avoids selecting recent IPO firms with high growth potential or high risks that affect the ERCs. Stock prices and returns from CRSP (Center for Research in Security Prices of the University of Chicago) must be available in tests involving these variables. To mitigate the potential effect of outliers, we remove the top and bottom 1% of observations for stock prices, book value and earnings. In the returns models, 1% of the extreme observations corresponding to returns, deflated book value changes and earnings changes are also removed. Our final sample has 94,687 observations for the price levels regressions and 92,783 observations for the returns regressions. The number of observations varies in other regressions depending on data availability.

We measure the various variables as follows. For fiscal year t, E_t is basic (primary) earnings per share before extraordinary items (Compustat item #58). BV_t (book value per share) is book value of equity (#60) divided by common shares used to calculate E_t (#54). Similarly, we obtain revenue per share (#12 divided by #54) and operating earnings (before depreciation) per share (#13 divided by #54). Firms with negative book values are deleted. As illustrated in Figure 1, the five-prior-year time series of E, revenue

per share, and operating earnings per share are used to form the various groups of sustained earnings growth in year *t*.

Following Hribar and Collins (2002), $Total\ Accruals_t$ are measured as the difference between income before extraordinary items (#123) and operating cash flow (#308) net of cash flow from extraordinary items (#124) from the cash flow statement. Working capital accruals ($WC\ Accruals_t$) are computed by adding depreciation expenses (#14) to total accruals. $Abnormal\ Accruals_t$ are estimated as the residuals from the cross-sectional modified Jones (1991) model.[7] These variables together with $Special\ Items_t$ (#17) are divided by total assets (#6) and expressed as percentages. $Share\ Change_t$ is the percentage change of shares (#54) used to calculate *E* from the previous year to the current year. $LT\ Growth_t$ is the average long-term earnings growth forecasts made in fiscal year *t* from *I/B/E/S*. While the above variables are calculated using year *t* data, the following two future performance measures are based on data in the following year. ROA_{t+1} is E_{t+1} divided by assets per share and expressed as a percentage. $Continuation_{t+1}$, unlike previous measures calculated at the firm level, is calculated at the group level. It is the percentage of firms with continuing earnings increases in year *t*+1 for an earnings growth group.

3.2. Descriptive Statistics

Table 1 presents the distribution of firm years with sustained earnings growth based on the 94,687 observations used in the sample for the price levels models. In Panel A, the frequency and percentage (relative to total firm years) of firm years with varying lengths of earnings increases are reported. Although Figure 1 only illustrates the grouping of firms with sustained earnings growth for at least five years, we also compute groupings for other lengths. Group G includes all the firms with earnings growth for a specified length (N). The total for all lengths (sum of the percentages in the group G column of Panel A) indicates that 58.07% of the firm years in our sample have earnings increases, consistent with 57.43% in Barth et al. (1999, Table 1). Most of the firms have increases of only one or two years. The sample contains 6,874 firm years or 7.26% with sustained earnings growth (earnings increases for five consecutive years). Out of those, 4,659 firm years have concurrent revenue increases (group S), while the

other 2,215 do not have concurrent revenue growth (group NS). For those with earnings and revenue increases, the majority also has concurrent operating earnings increases (group SO). But for those without sustained revenue increases, about half the firms have concurrent operating earnings increases (group NSO) while the other half do not have such increases (group NSNO).

Panel B presents the time profile of firms with sustained earnings growth for at least five years. It appears that firms with long strings of growth in earnings are more prevalent in the first couple of years in our sample period. The frequency of such firms reaches the bottom in 1994 and starts to increase after that. The patterns for the various groups are very similar. There does not appear to be any evidence that particular groups are concentrated in certain years.

Untabulated results indicate that the 6,874 firm years with earnings increases for at least five years are widely distributed in 66 different industries (based on 2-digit SIC codes). The only industry with more than 10% of these years is depository institutions (SIC 60). Relative to the total firm years of each industry, firms with sustained earnings increases represent a small proportion. The exceptions are tobacco (SIC 21) and personal services (SIC 72). More than 20% of the firm years in these two industries have five or more years of sustained earnings increases, but they represent less than 1.3% of the total 6,874 firm years. The industry distribution patterns for the various groups are quite similar, suggesting that revenue or non-revenue sustained earnings growth is not specific to certain industries.

Table 2 presents the means and standard deviations of the variables used in the regressions. It appears that average stock prices (P_t) and returns (Ret_t) for firms with sustained earnings growth (group G) are nearly twice those of the overall averages; the average earnings and book value (E_t and BV_t) and changes in earnings and book value (ΔE_t and ΔBV_t) are also much higher. While earnings and book value for group S are similar to those for group NS, group S has higher prices. The magnitude of earnings growth is slightly smaller for group S than for group NS, but returns are comparable. These results suggest that holding earnings performance constant, group S is likely to be valued higher. Similarly, groups with sustained operating earnings increases seem to be valued higher than those without operating

earnings increases. Table 2 also contains information on five-year average growth rates, equity betas and firm size that are used in Section 4.3.2.

4. Results

Except for results in section 4.2, regressions are run separately for each year during the sample period to mitigate potential concerns with cross-sectional dependence among observations. The reported mean coefficients and the t-statistics are obtained from the Fama-McBeth (1973) procedures. Results from pooled regressions with or without fixed effects are stronger (not presented).

4.1. Earnings Persistence

Table 3 reports the results on earnings persistence for models (1) and (2). Model (1a) examines the difference in persistence of earnings levels across groups S and NS. For firms without sustained earnings growth, the persistence parameter is $b_1 = 0.613$ (t = 20.15) for negative earnings and $b_2 = 0.814$ (t = 23.39) for positive earnings. The incremental persistence parameter is $b_3 = 0.251$ for group S and $b_4 = 0.132$ for group NS, both highly significant (t > 4). Since earnings are deflated by stock prices, the parameters suggest that 1% of current ROEs is able to predict about 1.065% (0.814 + 0.251) of future ROEs for firms in group S and 0.946% (0.814 + 0.132) for firms in group NS. The difference between the two is highly significant ($b_3 - b_4 = 0.119\%$, t = 3.85).

Model (2a) examines the persistence of earnings changes. For firms without sustained earnings growth, the persistence parameter is $b_1 = -0.648$ (t = -13.80) for negative changes and $b_2 = 0.016$ (t = 1.72) for positive changes. This is consistent with previous findings of differential persistence of negative and positive earnings changes (Elgers and Lo, 1994). While large earnings decreases tend to be followed by earnings increases, the significantly negative intercept $b_0 = -0.022$ and the small and marginally significant coefficient b_2 suggest that earnings increases are likely to be followed by an average earnings decrease unrelated to the size of the current earnings increase. Noticeably, the highly significant incremental persistence parameter $b_3 = 0.795$ (t = 5.67) indicates that earnings growth of firms in groups S is followed by smaller subsequent earnings decreases and possibly earnings increases. Table 4 below

confirms that they are indeed associated with more subsequent earnings increases. Group NS, however, behaves similar to an average firm (b_4 = 0.137, t = 1.06). The difference between groups S and NS is highly significant ($b_3 - b_4$ = 0.658, t = 3.95).

Models (1b) and (2b) compare groups SO, SNO, NSO and NSNO and yield consistent results. The incremental persistence parameters are the highest for group SO (b_{31}) and lowest for group NSNO (b_{42}). Both revenue-growth groups SO and SNO have higher persistence parameters than their cost-reduction counterparts NSO and NSNO ($b_{31} > b_{41}$, $b_{32} > b_{42}$). For both the revenue-growth firms and the cost-reduction firms, the subgroups with operating earnings increases have higher persistence parameters than the ones without ($b_{31} > b_{32}$, and $b_{41} > b_{42}$). The differences are generally significant. Overall, results on earnings persistence are consistent with our predictions.

4.2. Earnings Management and Future Performance

Table 4 presents the results on earnings management and future operating performance. Panel A provides the mean measures for the various groups and Panel B reports the differences of these measures between the groups. All accrual items (*Total Accruals*$_t$, working capital (*WC) Accruals*$_t$, and *Abnormal Accruals*$_t$) are higher for firms with sustained earnings growth (group G) than the overall averages. This is consistent with the Dechow, Sloan and Sweeney (1995) finding that accrual measures are correlated with earnings performance. Similarly, *Special Items*$_t$ are also higher for firms in group G.

Our main interest is to compare the revenue-growth firms (group S) with the cost-reduction firms (group NS). Note that *Total Accruals*$_t$ and *WC Accruals*$_t$ are generally high when revenues are increasing (Jones, 1991). Thus, using these two measures of accruals would bias the analysis against finding results consistent with our hypothesis. However, consistent with our hypothesis, both measures are lower for group S than those for group NS. The differences between the two groups are -0.90 (*Total Accruals*$_t$) and -0.81 (*WC Accruals*$_t$), both significant at less than 7% level (one-tailed). On the other hand, *Abnormal Accruals*$_t$ from the Jones model treats all revenue-change-related accruals as normal accruals. The difference between *Abnormal Accruals*$_t$ for groups S and NS is -1.93, which is significant at less than 1%

level (t = -3.16). Taken together, our results show that firms in group S are less likely to use income-increasing accruals than firms in group NS. Among groups SO, SNO, NSO and NSNO, accruals are generally the lowest for the group SO and the highest for the group NSNO. There is no difference in *Special Items*$_t$ between any of the groups. Overall, there is no evidence to suggest that revenue-growth firms achieve earnings growth through more aggressive earnings management. Although the possibility of a few firms engaging in earnings management to sustain growth cannot be ruled out, they do not seem to be representative of the revenue-growth firms.

To address the concern that firms might manage earnings per share through share repurchases to achieve earnings growth (Bens et al., 2003), we examine the changes in the number of shares and find that firms with sustained earnings growth tend to increase their net shares even more so than average firms (*Share Change*$_t$). This suggests that the earnings growth is not sustained systematically through aggressive share repurchase programs. None of the differences in share changes between the various groups is significant, with group S having slightly more share increases than group NS.

To the extent earnings sustainability is associated with future performance, we also expect firms with sustained earnings and revenue growth to have superior future performance. Table 4 indicates that firms with sustained earnings growth, on average, have much higher subsequent returns (ROA_{t+1}) and are more likely to continue earnings increases in the following year ($Continuation_{t+1}$). However, analysts' long-term earnings growth forecasts in year *t* (*LT Growth*$_t$) are lower than an average firm, possibly reflecting analysts' belief of the long-run mean-reverting property of earnings (Beaver and Morse, 1978).

Panel B indicates that relative to group NS, group S's long-term growth forecasts by analysts are higher by 2.42% (t = 6.79). Its subsequent *ROA*s are higher by 4.58% (t = 6.60). Consistent with results in Table 3 that earnings growth of firms in group S is less likely to reverse in the subsequent period, 7.17% (t = 5.61) more firms continue to have earnings increases the following year. The differences appear economically significant. Also consistent with our predictions, the performance measures are the highest for group SO and the lowest for group NSNO.

4.3. Earnings Response Coefficients

4.3.1. Main results

Table 5 reports our main results on ERCs. In the price levels Model (3a), the ERC on positive earnings is much higher than that on negative earnings ($b_2 = 6.840 > b_1 = 0.372$). The corresponding BVRCs differ in the opposite direction ($c_2 = 0.466 < c_1 = 0.745$). This is consistent with Collins et al.'s (1998) argument that the valuation role of book value is important when earnings are negative. For our variables of interest, the incremental ERC (b_3) for group S is 8.165 (t = 12.94). The incremental ERC (b_4) for group NS is 4.294 (t = 6.21), which is only about one half of b_3. The difference of 3.870 is highly significant (t = 9.51). As expected, the incremental BVRCs for both groups are negative ($c_3 = -0.819$, $c_4 = -0.616$, $t < -5.6$). In fact, the magnitude of the negative incremental BVRCs is so large that the total BVRCs become negative, especially for group S ($c_2 + c_3 = -0.353$, $c_2 + c_4 = -0.150$) (also see, Burgstahler and Divhev, 1997; Chen and Zhang, 2002).[8] Overall, the results suggest that as firms' growth becomes more sustainable, the valuation weight on earnings becomes larger and the valuation weight on book value becomes smaller or even negative.

For Model (3b) with groups SO, SNO, NSO and NSNO, the results are consistent with the prediction that groups with sustained revenue increases have higher ERCs than those without sustained revenue increases, and that within the revenue-growth and non-revenue growth groups those with sustained operating earnings growth have higher ERCs ($b_{31} > b_{41}$, $b_{32} > b_{42}$, $b_{31} > b_{32}$, and $b_{41} > b_{42}$). Three of the four paired-differences are statistically significant. Similarly, the incremental BVRCs are all negative, especially for the two groups with operating earnings growth that have the highest incremental ERCs.

In the returns Model (4a), positive and negative earnings changes have similar ERCs for average firms ($b_1 = 0.551$, $b_2 = 0.636$). But the BVRC on book value changes is higher when earnings changes are positive than when they are negative ($c_1 = 0.193$, $c_2 = 0.838$). Group S has an incremental ERC of $b_3 = 8.244$ (t = 6.75) on earnings changes, significantly higher than $b_4 = 3.330$ (t = 4.36) for group NS.[9] Like

in Model (3a), both groups have negative incremental BVRCs on book value changes, but the difference between the two is not significant. In Model (4b), group SO has by far the highest incremental ERC (b_{31} = 10.370, t = 6.29) and the most negative incremental BVRC (c_{31} = -0.443, t = -2.93). The ERC differentials are generally consistent with our expectations except that the ERCs for groups NSO and NSNO are nearly the same.

Overall, results from Models (4a) and (4b) are consistent with those from Models (3a) and (3b). They suggest that market valuation is higher for earnings and lower for book value when earnings growth is sustained through revenue increases, and the effect is especially strong when operating costs are also under control.

4.3.2. Additional Tests

We conduct a number of other sensitivity checks for the primary results in Table 5 (untabulated). For example, for the levels models, we use asset per share or lagged price to deflate all variables. For the returns models, we use market-adjusted returns rather than raw returns. Following Easton and Harris (1991), we include both earnings levels and earnings changes as the explanatory variables. We also use operating earnings after depreciation (Compustat #178) instead of operating earnings before depreciation as a measure of operating earnings. None of our results is qualitatively affected.

To further explore whether the coefficient differentials in Table 5 are driven by factors other than sources of earnings growth such as differences in growth rates, risks, size or industry effects, we calculate the past five-year average earnings growth rates ($\overline{\Delta E_{t-4,t}}$), equity betas ($Beta_t$) and firm size ($Size_t$) for the various groups.[10] Table 2 indicates that the average growth rates for group S are no higher than those for group NS and that the equity betas are similar across the groups. Thus, the higher ERCs for group S cannot be attributed to higher prior growth rates or higher risks. However, firms in group S, on average, are larger than those in group NS on average. To study the association between size and ERCs, we separate the sample into two subsamples based on the median size and estimate the regressions for each subsample. The ERC differentials between groups S and NS are almost the same across the large and the

small firms. We also conduct regressions within broadly defined industries and find higher ERCs for group S than for group NS in all industries. Most of the differences between the ERCs are statistically significant.[11]

We also examine how ERCs change for varying lengths of growth. We estimate Models (3a) and (4a) for the various groups that have earnings growth sustained over 1, 2, 3, 4, and 5 years. The results indicate that the incremental ERCs increase when the length of the earnings strings increases. For the levels model, the incremental BVRCs decrease correspondingly. Most important, ERCs of group S always dominate those of group NS for any length of earnings growth. The differences are always statistically and economically significant. In addition, for the levels model, the incremental valuation weight on earnings is not significant in the first few years of earnings increases when the increases are achieved through cost reductions. Earnings with revenue-supported growth, on the other hand, have an incremental ERC as soon as positive growth is achieved.

Finally, we also conduct tests on the response coefficients when strings of consecutive earnings increases are broken. Although firms with prior earnings growth are expected to revert to average firms when the earnings growth can no longer be sustained, they could behave differently if prior earnings growth was supported by revenue increases.[12] Barth et al. (1999) find, without allowing BVRCs to differ across groups in the levels model, that the incremental ERC is still positive in the year that the earnings strings are broken and is eliminated only when the strings are followed by *two consecutive* earnings decreases. We find that this result only applies to firms previously in group S. The incremental ERC disappears immediately for firms previously in group NS. When allowing BVRC to differ as in Model (3a), we find that the incremental valuation weight for firms previously in group S is on book value instead of earnings.

For the returns model, we find that while the "premium" on earnings growth is high when the growth is sustained through revenue increases, the "penalty" on earnings decreases is also more severe when the growth can no longer be continued. The incremental ERC on ΔE for firms previously in group S is significantly positive in the year that the earnings strings are broken. Since ΔE is negative when

earnings strings are broken, the positive incremental ERC suggests that, relative to an average firm with the same earnings decrease, firms with both prior earnings and revenue increases (group S) have incrementally lower returns. On the other hand firms previously in group NS are treated no differently from average firms.

5. Conclusions

In this paper, we explore the quality of earnings and earnings response coefficients when sustained increases in earnings are supported by concurrent sustained increases in revenues. We hypothesize that earnings are of higher quality when growth in earnings is supported by revenue increases rather than through cost reductions. Revenue-supported earnings growth is likely to be more sustainable because revenue is the key value driver and its growth often reflects the underlying product differentiation strategy (Porter 1980, 1985). Unlike cost reductions that are often reactive and have a lower bound, revenue increases are proactive with unlimited potential. Earnings manipulation is also more difficult through revenues than through expenses. Furthermore, since quality of earnings is value-relevant (e.g., Penman, 2004), we predict that firms with revenue-supported growth in earnings have higher earnings response coefficients.

Our results are consistent with the predictions. We find that earnings are of higher quality for the revenue-growth firms than for cost-reduction firms. Relative to the cost-reduction firms, earnings for the revenue-growth firms are more persistent and are less likely to be managed through accounting accruals, special items or share repurchases. The revenue-growth firms also have higher future operating performance. With respect to response coefficients, we use the Ohlson (1995) model to test our hypothesis and find that for the revenue-growth firms, the earnings response coefficients are higher. Additionally, the higher ERCs for the revenue-growth firms are accompanied by lower response coefficients on book value, consistent with the implications of the Ohlson model. Finally, we find that earnings quality and ERCs are the highest when sustained increases in earnings are supported by sustained increases in both revenues and operating earnings.

Understanding a firm's business strategy is an integral part of understanding its financial statements (Penman, 2004; Lundholm and Sloan, 2004). This study attests to the link between the business strategy analysis and financial statement analysis. Our results suggest that the success of different business strategies is likely to be manifested through different components of earnings and ultimately through different valuations. In applying accounting based valuation analysis, not only should we consider the earnings growth pattern itself, but also differentiate between the sources of earnings growth due to different business strategies. Sustained growth in earnings and sustained growth in revenues are easily observable signals and can be easily incorporated into such valuation analysis. These results should be of interest to both practitioners and academics who have paid increasing attention to the issue of earnings quality and valuation in recent years.

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Notes

[1]Barth et al. (1999) use "earnings multiples" to refer to the coefficients on earnings in price levels regressions or on earnings changes in returns regressions where book value and other control variables are also included as regressors. We use the term "earnings response coefficients" here since "earnings multiples" often refers to price-to-earnings ratios. Similarly, we use "book value response coefficients" instead of "book value multiples" to refer to the coefficients on book value or changes in book value.

[2]Even for a well-established successful cost leader like Wal-Mart, sustained growth in earnings has been accomplished through sustained increases in revenues rather than sustained decreases in costs alone.

[3]Cappelli (2000) finds that downsizing could reduce sales as well as labor costs per employee and that a more successful strategy is to improve revenue per employee. Worrell et al. (1991), among many others, show that stock prices tend to decline following corporate downsizing. Part of the negative effect can be traced to a wide range of adverse effects on the workforce (Cameron, 1994).

[4]Other than accounting accruals, it is not clear whether revenue-growth firms are less able to manage earnings per share through share repurchases than cost-reduction firms. If revenue-growth firms are indeed better performing firms, they should rely less on earnings management in general. Thus, we also examine share repurchases.

[5]Some of these firms may have achieved earnings growth through non-operating gains such as those from asset sales. These are typically special or nonrecurring items that are more transitory in nature. Their earnings persistence and valuation weights vary but are generally smaller than earnings before these items (Gu and Chen, 2003). Thus, these items do not affect our predictions on earnings persistence and valuation effects.

[6]For our sample of firms with sustained earnings growth for at least five years, only less than 1% have negative earnings. If we exclude firms with negative earnings by interacting the dummy variables in Models (1a) and (1b) with E^+ instead of E, there is no noticeable effect on any of the reported results.

[7]Specifically, *Abnormal Accruals* is estimated as the residuals from the regressions $TA/Assets = \beta_0\ 1/Asset + \beta_1 (\Delta Rev - \Delta AR) + \beta_2\ PPE + \varepsilon$, where ΔRev is the change in revenue, ΔAR is the change in accounts payables (negative of #302), and *PPE* is the gross property, plant and equipment (#7). The regressions are run for each

combination of fiscal year and 2-digit SIC code, with a minimum of 15 observations. The original Jones (1991) model produces similar results.

[8] Zhang (2000) incorporates real options into the Ohlson (1995) model and predicts that that the coefficient on book value can be negative. This occurs when equity value is dominated by the value of the growth option, which is negatively related to book value. This explanation fits well with our argument and suggests that the firms with sustained increases in earnings, especially those in group S, are perceived to have sufficiently better future growth opportunities than average firms and are valued accordingly.

[9]The magnitude of the coefficients is comparable to those in Barth et al. (1999, Table 5). Barth et al. do not separate profits from losses and group S from group NS and obtain a coefficient of about 4.5 for group G from annual regressions. If we do the same, we obtain a coefficient of about 4.0.

[10]The past five-year average earnings growth rate for a firm in year t is calculated as $\overline{\Delta E_{t-4,t}} = (\sum_{\tau=0}^{4} \Delta E_{t-\tau}/P_{t-\tau-1}) / 5$. Results using $(E_t - E_{t-5})/P_{t-5}$ or using $|E_{t-i}|$ as the denominator are qualitatively similar. Equity beta (*Beta*) is estimated using monthly returns from 36 (minimum 24) months before the fiscal year-end. Firm size (*Size*) is measured as the year-end market capitalization.

[11] Only the transportation and utilities industries (SIC 40 to 50) have positive but insignificant ERC differentials (from Model 3(a)).

[12] The results are not reported but are available upon request.

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TABLE 1

Distribution of firms with sustained earnings growth based on 94,687 observations

Panel A: Frequency of firm years with sustained earnings growths for *N* years (% relative to total firm years)

	Group G_t	Group S_t	Group NS_t	Group SO_t	Group SNO_t	Group NSO_t	Group $NSNO_t$
N = 1	25,085 (26.49)	17,569 (18.55)	7,516 (7.94)	16,243 (17.15)	1,326 (1.40)	5,003 (5.28)	2,513 (2.65)
N = 2	12,755 (13.47)	7,781 (8.22)	4,947 (5.25)	6,891 (7.28)	890 0.94)	2,880 (3.04)	2,094 (2.21)
N = 3	6,625 (7.00)	3,809 (4.02)	2,816 (2.97)	3,259 (3.44)	550 (0.58)	1,435 (1.52)	1,381 (1.46)
N = 4	3,650 (3.85)	2,062 (2.18)	1,588 (1.68)	1,709 (1.80)	353 (0.37)	752 (0.79)	836 (0.88)
N ≥ 5	6,874 (7.26)	4,659 (4.92)	2,215 (2.34)	3,937 (4.16)	722 (0.76)	1,017 (1.07)	1,198 (1.27)

Panel B: Time profile of sustained earnings growths for at least 5 years

Year	% relative to total firms each year						
	Group G_t	Group S_t	Group NS_t	Group SO_t	Group SNO_t	Group NSO_t	Group $NSNO_t$
1980	17.29	13.88	3.41	11.47	2.41	1.49	1.92
1981	14.88	12.23	2.65	10.00	2.23	0.99	1.66
1982	10.13	7.40	2.73	5.98	1.42	1.12	1.61
1983	8.14	5.63	2.51	4.54	1.09	1.01	1.49
1984	7.52	4.67	2.84	3.63	1.04	1.07	1.78
1985	6.54	3.76	2.78	3.09	0.67	1.00	1.78
1986	6.54	3.50	3.04	2.96	0.54	1.28	1.76
1987	6.50	4.11	2.39	3.51	0.61	1.17	1.22
1988	6.98	4.72	2.26	4.05	0.67	0.84	1.42
1989	6.24	4.26	1.98	3.54	0.72	0.77	1.21
1990	6.18	4.19	1.99	3.49	0.70	0.82	1.16
1991	5.88	3.82	2.06	3.22	0.61	0.90	1.16
1992	5.82	3.73	2.08	3.16	0.57	1.08	1.01
1993	5.07	3.03	2.04	2.62	0.41	1.10	0.95
1994	4.72	2.78	1.94	2.46	0.32	0.98	0.96
1995	5.40	2.83	2.58	2.44	0.39	1.27	1.31
1996	6.35	3.71	2.64	3.28	0.42	1.28	1.36
1997	6.27	4.38	1.89	3.85	0.53	1.02	0.87
1998	7.20	4.98	2.22	4.44	0.55	1.19	1.02
1999	7.06	5.12	1.94	4.56	0.56	1.08	0.86
2000	7.52	5.63	1.90	4.75	0.87	1.00	0.89

The sample covers all firms in Compustat during 1980-2000, active or inactive, with at least five consecutive years of earnings per share (Compustat #58), book value per share (#60 divided by #54), revenue per share (#12 divided by #54), and operating earnings per share (#13 divided by #54). Firms with negative book value are deleted. Strings of variables are calculated starting from 1976 to allow a firm in 1980 to have enough prior history to show a string of at least five years. Stock prices from CRSP must also be available. Observations with stock prices, book value and earnings in the top and bottom 1% are removed. Group G_t includes all firms that report *N* years of consecutive increases in earnings per share up to year *t*. Group S_t includes firms in group G_t that also report *N* years of consecutive increases in revenue per share up to year *t*. Group NS_t includes firms in group G_t that do not belong to group S_t. Group SO_t includes firms in group S_t that also report *N* years of consecutive increases in operating earnings per share up to year *t*. Group SNO_t includes firms in group S_t that do not belong to group SO_t. Group NSO_t includes firms in group NS_t that report *N* years of consecutive increases in operating earnings per share up to year *t*. Group $NSNO_t$ includes firms in group NS_t that do not belong to group NSO_t. See also Figure 1 for a graphical illustration of the grouping.

TABLE 2

Summary statistics for variables used in the regressions: Means (*standard deviations*)

	Overall Sample	Group G_t	Group S_t	Group NS_t	Group SO_t	Group SNO_t	Group NSO_t	Group $NSNO_t$
P_t ($)	17.219 (16.777)	32.070 (19.272)	33.800 (19.165)	28.431 (18.991)	34.449 (19.255)	30.264 (18.282)	29.270 (19.750)	27.717 (18.293)
Ret_t	0.152 (0.587)	0.286 (0.471)	0.288 (0.469)	0.281 (0.475)	0.286 (0.467)	0.299 (0.481)	0.291 (0.487)	0.273 (0.465)
E_t ($)	0.825 (1.666)	2.310 (1.527)	2.330 (1.484)	2.270 (1.641)	2.296 (1.453)	2.515 (1.634)	2.183 (1.580)	2.343 (1.688)
$\Delta E_t/P_{t-1}$	0.008 (0.174)	0.018 (0.037)	0.015 (0.019)	0.024 (0.059)	0.015 (0.017)	0.017 (0.026)	0.024 (0.071)	0.024 (0.047)
BV_t ($)	9.789 (9.742)	13.489 (9.847)	13.051 (9.372)	14.411 (10.722)	12.671 (9.062)	15.123 (10.680)	13.655 (10.820)	15.053 (10.820)
$\Delta BV_t/P_{t-1}$	0.012 (0.201)	0.077 (0.090)	0.076 (0.078)	0.081 (0.110)	0.074 (0.076)	0.083 (0.088)	0.079 (0.098)	0.082 (0.065)
$\overline{\Delta E_{t-4,t}}$	0.017 (0.150)	0.037 (0.058)	0.030 (0.035)	0.050 (0.087)	0.030 (0.034)	0.032 (0.040)	0.047 (0.080)	0.053 (0.092)
$Beta_t$	1.002 (0.808)	1.038 ((0.597)	1.069 (0.559)	0.972 (0.664)	1.074 (0.555)	1.041 (0.582)	0.998 (0.629)	0.950) (0.692)
$Size_t$ (*mil $*)	520.484 (1269.248)	1264.285 (1936.531)	1408.049 (2031.786)	960.117 (1677.977)	1467.998 (2061.634)	1081.840 (1828.161)	1071.429 (1828.140)	866.262 (1534.555)

For firm year t, P_t is the stock price at the end of the third month after the fiscal year-end; Ret_t is the compounded stock return from the fourth month of the fiscal year to the third month after the year-end; E_t is primary earnings per share before extraordinary items (#58); BV_t is book value per share (#60 divided by #54). Δ is the difference operator. $\overline{\Delta E_{t-4,t}}$ is the past five-year average earnings growth rate calculated as $(\sum_{\tau=0}^{4} \Delta E_{t-\tau}/P_{t-\tau-1}) / 5$; $Beta_t$ is the equity beta estimated from monthly returns from 36 (minimum 24) prior months; $Size_t$ is the market capitalization at the end of the fiscal year-end. Except for Ret_t, $\Delta E_t/P_{t-1}$ and $\Delta BV_t/P_{t-1}$, variables are based on the sample for the price levels regressions (see Table 1 for sample selection). The sample for the returns regressions imposes the additional criteria that Ret_t and P_{t-1} must be available from CRSP and that observations with Ret_t, $\Delta E_t/P_{t-1}$ and $\Delta BV_t/P_{t-1}$ in the top and bottom 1% are removed. Definitions of the various groups are in Table 1.

TABLE 3

Regression results for earnings persistence:
Sustained earnings growth of at least five years from various sources

Models:

$$E_{t+1}/P_t = b_0 + b_1 E_t^-/P_{t-1} + b_2 E_t^+/P_{t-1} + b_3 E_t/P_{t-1} \times D_t^S + b_4 E_t/P_{t-1} \times D_t^{NS} + \varepsilon_{t+1} \quad (1a)$$

$$E_{t+1}/P_t = b_0 + b_1 E_t^-/P_{t-1} + b_2 E_t^+/P_{t-1} + b_{31} E_t/P_{t-1} \times D_t^{SO} + b_{32} E_t/P_{t-1} \times D_t^{SNO} + b_{41} E_t/P_{t-1} \times D_t^{NSO} + b_{42} E_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_{t+1} \quad (1b)$$

$$\Delta E_{t+1}/P_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_3 \Delta E_t/P_{t-1} \times D_t^S + b_4 \Delta E_t/P_{t-1} \times D_t^{NS} + \varepsilon_{t+1} \quad (2a)$$

$$\Delta E_{t+1}/P_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_{31} \Delta E_t/P_{t-1} \times D_t^{SO} + b_{32} \Delta E_t/P_{t-1} \times D_t^{SNO} + b_{41} \Delta E_t/P_{t-1} \times D_t^{NSO} + b_{42} \Delta E_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_{t+1} \quad (2b)$$

Variables (Expected sign)	Model (1a)	Model (1b)	Model (2a)	Model (2b)
b_0	-0.022 (-7.96)	-0.022 (-7.99)	-0.022 (-9.18)	-0.022 (-9.20)
b_1	0.613 (20.15)	0.613 (20.11)	-0.648 (-13.80)	-0.648 (-13.79)
b_2	0.814 (23.39)	0.815 (23.40)	0.016 (1.72)	0.016 (1.72)
b_{31} (+)		0.274 (9.48)		0.893 (5.81)
b_3 (+)	0.251 (9.19)		0.795 (5.67)	
b_{32} (+)		0.170 (4.85)		0.594 (3.59)
b_{41} (+)		0.191 (5.38)		0.271 (1.81)
b_4 (+)	0.132 (4.12)		0.137 (1.06)	
b_{42} (+)		0.092 (2.58)		-0.094 (-0.49)
Mean *Adj.* R^2	0.265	0.265	0.102	0.102
Differences in the coefficients				
$b_3 - b_4$ / $b_{31} - b_{41}$ (+)	0.119 (3.85)	0.083 (2.38)	0.658 (3.95)	0.622 (3.33)
$b_{32} - b_{42}$ (+)		0.078 (1.96)		0.688 (2.49)
$b_{31} - b_{32}$ (+)		0.104 (2.80)		0.300 (1.61)
$b_{41} - b_{42}$ (+)		0.099 (2.84)		0.365 (1.91)

For sample selection and variable definitions, see Tables 1 and 2. D_t^S, D_t^{NS}, D_t^{SO}, D_t^{SNO}, D_t^{NSO}, and D_t^{NSNO} are dummy variables for firms falling into groups S, NS, SO, NSO and NSNO in year t (defined in Table 1), respectively. E_t^- and E_t^+ are positive and negative measures of earnings ($E_t > 0$ and $E_t < 0$). ΔE_t^- and ΔE_t^+ are positive and negative measures of earnings changes ($\Delta E_t > 0$ and $\Delta E_t < 0$). Observations in the top and bottom 1% of E_{t+1}/P_t, E_t/P_{t-1}, $\Delta E_{t+1}/P_t$ and $\Delta E_t/P_{t-1}$ are removed. Regressions are run for each year of 1980-2000 with a mean of 4,092 observations. The mean coefficients are reported with *t*-statistics (in parenthesis) obtained from dividing the means of the annual coefficients by their standard errors.

TABLE 4

Measures of earnings management and future operating performance

Panel A: Means of measures for different groups

	Overall Sample	Group G_t	Group S_t	Group NS_t	Group SO_t	Group SNO_t	Group NSO_t	Group $NSNO_t$
Total Accruals$_t$	-5.272	-1.964	-2.248	-1.352	-2.283	-2.035	-2.198	-0.639
WC Accruals$_t$	-0.542	2.108	1.852	2.660	1.886	1.648	2.217	3.304
Abnormal Accruals$_t$	0.270	1.496	0.885	2.815	0.937	0.550	2.038	3.496
Special Items$_t$	-0.993	0.097	0.051	0.199	0.019	0.231	-0.012	0.375
Share Change$_t$	19.064	26.210	27.410	23.686	28.841	19.605	24.363	23.111
LT Growth$_t$	17.221	16.456	17.241	14.824	17.443	15.933	15.384	14.315
ROA$_{t+1}$	0.640	9.294	10.761	6.176	11.085	8.985	6.529	5.873
Continuation$_{t+1}$	58.081	70.041	72.341	65.176	73.684	65.049	68.000	62.804

Panel B: Differences between groups (t-stat)

	Groups S_t vs. NS_t	Groups SO_t vs. NSO_t	Groups SNO_t vs. $NSNO_t$	Groups SO_t vs. SNO_t	Groups NSO_t vs. $NSNO_t$
Total Accruals$_t$	-0.90 (-1.56)	-0.09 (-0.11)	-1.40 (-1.33)	-0.25 (-0.27)	-1.56 (-1.67)
WC Accruals$_t$	-0.81 (-1.53)	-0.33 (-0.46)	-1.39 (-1.40)	0.24 (0.28)	-0.82 (-0.93)
Abnormal Accruals$_t$	-1.93 (-3.16)	-1.10 (-1.33)	-2.95 (-2.52)	0.39 (0.38)	-1.46 (-1.44)
Special Items$_t$	-0.15 (-0.59)	0.03 (0.09)	-0.14 (-0.31)	-0.21 (-0.54)	-0.39 (-0.92)
Share Change$_t$	3.72 (0.38)	4.48 (0.33)	-3.51 (-0.19)	9.24 (0.60)	1.25 (0.08)
LT Growth$_t$	2.42 (6.79)	2.06 (4.32)	1.62 (2.36)	1.51 (2.53)	1.07 (1.82)
ROA$_{t+1}$	4.58 (6.60)	4.56 (4.82)	3.11 (2.45)	2.10 (1.93)	0.66 (0.57)
Continuation$_{t+1}$	7.17 (5.61)	5.68 (3.26)	2.24 (0.97)	8.64 (4.33)	5.20 (2.46)

For sample selection and formation of groups, see Table 1. For firm year *t*, *Total Accruals*$_t$ is the difference between income before extraordinary items (#123) and operating cash flow (#308) net of cash flow from extraordinary items (#124); working capital (*WC*) *Accruals*$_t$ are depreciation expenses (#14) added to *Total Accruals*$_t$; *Abnormal Accruals*$_t$ is estimated as the residuals from the cross-sectional modified Jones model; and *Special items*$_t$ are #17. These measures are divided by assets (#6) and expressed in percentages. *Share Change*$_t$ is the percentage change of shares (#54) from the previous year to the current year; *LT Growth*$_t$ is the analyst long-term earnings growth forecasts from *I/B/E/S*. For year *t+1*, *ROA*$_{t+1}$ is total earnings divided by assets and expressed in percentages; and *Continuation*$_{t+1}$ is the percentage of firms with continuing earnings increases.

TABLE 5

Regressions of prices/returns on explanatory variables:
Sustained earnings growth of at least five years from various sources

Models:

$$P_t = b_0 + b_1 E_t^- + b_2 E_t^+ + b_3 E_t \times D_t^S + b_4 E_t \times D_t^{NS} + c_1 BV_t \times D_t^{E-} + c_2 BV_t \times D_t^{E+} + c_3 BV_t \times D_t^S + c_4 BV_t \times D_t^{NS} + \varepsilon_t \quad (3a)$$

$$P_t = b_0 + b_1 E_t^- + b_2 E_t^+ + b_{31} E_t \times D_t^{SO} + b_{32} E_t \times D_t^{SNO} + b_{41} E_t \times D_t^{NSO} + b_{42} E_t \times D_t^{NSNO} + + c_1 BV_t \times D_t^{E-} + c_2 BV_t \times D_t^{E+} + c_{31} BV_t \times D_t^{SO} + c_{32} BV_t \times D_t^{SNO} + c_{41} BV_t \times D_t^{NSO} + c_{42} BV_t \times D_t^{NSNO} + \varepsilon_t \quad (3b)$$

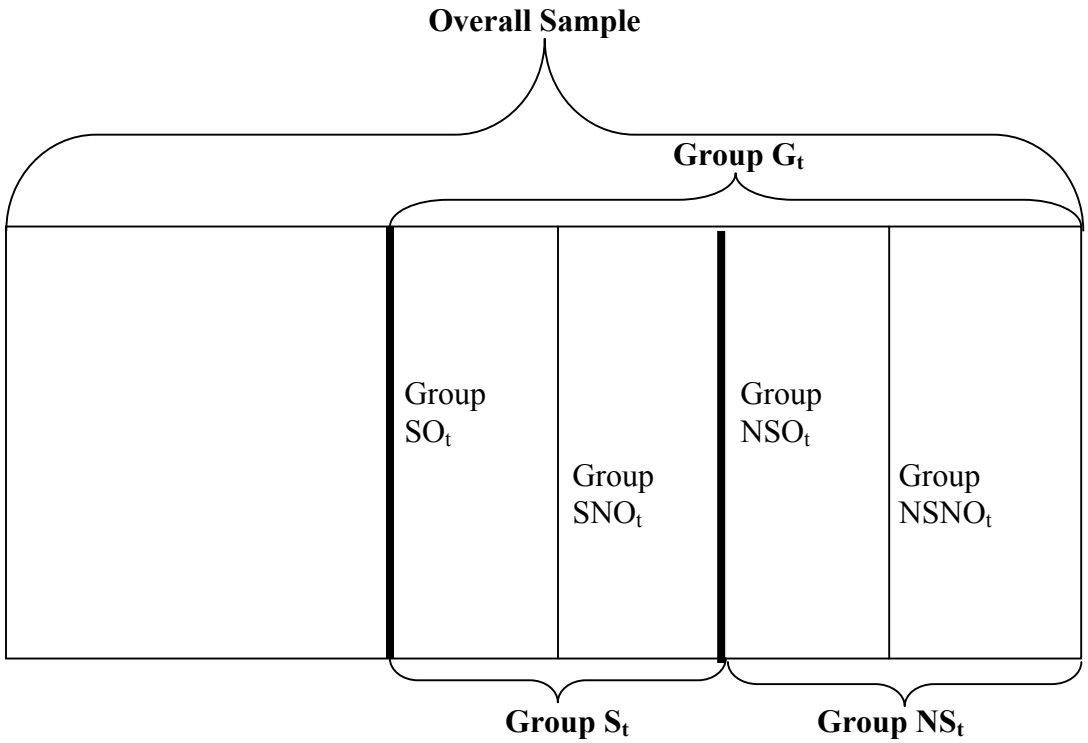
$$Ret_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_3 \Delta E_t/P_{t-1} \times D_t^S + b_4 \Delta E_t/P_{t-1} \times D_t^{NS} + c_1 BV_t/P_{t-1} \times D_t^{\Delta E-} + c_2 BV_t/P_{t-1} \times D_t^{\Delta E+} + c_3 \Delta BV_t/P_{t-1} \times D_t^S + c_4 \Delta BV_t/P_{t-1} \times D_t^{NS} + \varepsilon_t \quad (4a)$$

$$Ret_t = b_0 + b_1 \Delta E_t^-/P_{t-1} + b_2 \Delta E_t^+/P_{t-1} + b_{31} \Delta E_t/P_{t-1} \times D_t^{SO} + b_{32} \Delta E_t/P_{t-1} \times D_t^{SNO} + b_{41} \Delta E_t/P_{t-1} \times D_t^{NSO} + b_{42} \Delta E_t/P_{t-1} \times D_t^{NSNO} + c_1 \Delta BV_t/P_{t-1} \times D_t^{\Delta E-} + c_2 \Delta BV_t/P_{t-1} \times D_t^{\Delta E+} + c_{31} \Delta BV_t/P_{t-1} \times D_t^{SO} + c_{32} \Delta BV_t/P_{t-1} \times D_t^{SNO} + c_{41} \Delta BV_t/P_{t-1} \times D_t^{NSO} + c_{42} \Delta BV_t/P_{t-1} \times D_t^{NSNO} + \varepsilon_t \quad (4b)$$

Variables (Expected sign)		Model (3a)	Model (3b)	Model (4a)	Model (4b)
b_0		4.867 (16.36)	4.843 (16.41)	0.117 (3.23)	0.116 (3.21)
b_1		0.372 (3.91)	0.366 (3.82)	0.551 (9.51)	0.549 (9.50)
b_2		6.840 (21.52)	6.842 (21.52)	0.636 (13.23)	0.638 (13.13)
b_3 (+)	b_{31} (+)	8.165 (12.94)	9.481 (16.10)	8.244 (6.75)	10.370 (6.29)
	b_{32} (+)		3.253 (2.66)		6.069 (3.29)
b_4 (+)	b_{41} (+)	4.294 (6.21)	7.787 (7.32)	3.330 (4.36)	3.551 (2.82)
	b_{42} (+)		2.705 (3.42)		3.406 (3.63)
c_1		0.745 (14.31)	0.207 (5.98)	0.193 (6.66)	0.193 (6.67)
c_2		0.466 (12.73)	0.924 (24.08)	0.838 (20.29)	0.839 (20.33)
c_3	c_{31}	-0.819 (-9.01)	-0.974 (-11.60)	-0.222 (-1.35)	-0.443 (-2.93)
	c_{32}		-0.270 (-1.52)		-0.133 (-0.28)
c_4	c_{41}	-0.616 (-5.63)	-1.104 (-7.18)	-0.273 (-2.79)	0.006 (0.03)
	c_{42}		-0.412 (-2.98)		-0.279 (-2.53)
Mean *Adj.* R^2		0.630	0.632	0.111	0.111
Mean nob.		4,509	4,509	4,417	4,417
Differences in the coefficients					
$b_3 - b_4$ / $b_{31} - b_{41}$ (+)		3.870 (5.08)	1.694 (1.62)	4.913 (3.20)	6.819 (3.22)
$b_{32} - b_{42}$ (+)			0.548 (0.34)		2.663 (1.33)
$b_{31} - b_{32}$ (+)			6.228 (5.25)		4.301 (2.02)
$b_{41} - b_{42}$ (+)			5.082 (3.64)		0.145 (0.09)
$c_3 - c_4$ / $c_{31} - c_{41}$		-0.203 (-1.79)	0.135 (0.77)	0.051 (0.30)	-0.450 (-1.45)
$c_{32} - c_{42}$			0.142 (0.56)		0.146 (0.32)
$c_{31} - c_{32}$			-0.704 (-3.93)		-0.310 (-0.67)
$c_{41} - c_{42}$			-0.692 (-3.17)		0.285 (1.04)

For sample selection and variable definitions, see Tables 1 and 2. For firm year t, E_t^- and E_t^+ are positive and negative measures of earnings ($E_t > 0$ and $E_t < 0$). ΔE_t^- and ΔE_t^+ are positive and negative measures of earnings changes ($\Delta E_t > 0$ and $\Delta E_t < 0$). D_t^{E-}, D_t^{E+}, $D_t^{\Delta E-}$ and $D_t^{\Delta E+}$ are dummy variables for $E_t < 0$, $E_t > 0$, $\Delta E_t < 0$ and $\Delta E_t > 0$. D_t^{S}, D_t^{NS}, D_t^{SO}, D_t^{SNO}, D_t^{NSO} and D_t^{NSNO} are dummy variables for firms with at least five years of consecutive earnings increases falling into groups S, NS, SO, NSO and NSNO in year t (defined in Table 1), respectively. Regressions are run for each year of 1980-2000. The mean coefficients are reported with t-statistics (in parenthesis) obtained from dividing the means of the annual coefficients by their standard errors.

Figure 1. Grouping of firms with sustained earnings growth from various sources



Group G_t: All firms with at least five years of consecutive increases in earnings per share up to year *t*;
Group S_t: Firms in group G_t that have at least five years of consecutive increases in revenue per share up to year *t*;
Group NS_t: Firms in group G_t that do not belong to group S_t;
Group SO_t: Firms in group S_t that have at least five years of consecutive increases in operating earnings per share up to year *t*;
Group SNO_t: Firms in group S_t that do not belong to group SO_t.
Group NSO_t: Firms in group NS_t that have at least five years of consecutive increase in operating earnings per share up to year *t*;
Group $NSNO_t$: Firms in group NS_t that do not belong to group NSO_t.