Earnings Management To Sustain Consecutive Earnings Increases

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ABSTRACT

In this paper, I examine the pattern of earnings management undertaken by firms with a string of at least five-year consecutive earnings increases. Results indicate that discretionary accruals of those firms intensify as firms move towards the end of an earnings string while the extent of discretionary accruals declines sharply when the string ends.

Keywords: Earnings Management; Discretionary Accruals; Consecutive Earnings Increases; Earnings String

1. INTRODUCTION

Many firms view attaining a string of consecutive earnings increases (labelled an earnings string) as an important goal because the capital market rewards consistent earnings growth and reacts negatively to the break to this pattern (Barth, Elliott & Finn 1999). Sustaining earnings growth is also important to firm managers who are remunerated based on performance (Ke 2004). While firms with competitive advantages in the product market can outperform their competitors (Porter 1985), maintaining a pattern of earnings increases is difficult due to the cyclical nature of underlying economic conditions. Thus, firm managers are often motivated to take actions to ensure the continuity of an earnings string for as long as possible. One method whereby growth in earnings can be artificially sustained is through earnings management. Myers, Myers and Skinner (2007) interpret a larger than expected number of firms with earnings momentum as *prima facie* evidence of earnings management. Crucial to this argument is the assumption that insiders have superior information about earnings, compared to outside investors. Information asymmetry allows insiders to predict or time the break to an earnings string by selling their shares three to nine quarters in advance of actual earnings reports announcing the reversal to an upward earnings trend, even though institutional investors normally do not start trading until one or two quarters before the break (Ke & Petroni 2004; Ke, Huddart & Petroni 2003). A break to an earnings string may eventually occur however, if it cannot be sustained even with the help of earnings management. Although previous studies have shown that firms tend to manage earnings in order to extend earnings momentum (Yong 2009; Baik, Farber, Johnson & Yi 2008), these studies do not consider the pattern of earnings management along an earnings string or when the string breaks.

The purpose of this paper is to fill the gap in the literature by studying earnings management through discretionary accruals (or accrual management) undertaken by firms with a string of consecutive earnings increases for at least five years (labelled ES firms). Specifically, I address the following research questions: First, do ES firms undertake more aggressive earnings management towards the end of an earnings string, compared to the early part of an earnings string? Second, is the year immediately following the end of an earnings string (i.e., the break year) characterized by a different pattern of earnings management from that within an earnings string?

To test the pattern of earnings management, I partition an earnings string into four sub-periods, i.e., Early-ES (the first two years of an earnings string), Mid-ES (from the third year of an earnings string to three years before the break), −2Break (two years before the break) and −1Break (one year before the break), and use performance-matched discretionary accruals ($DACC^{PM}$) to proxy for earnings management, respectively. I employ a research design that treats firm-year observations from Early-ES as the reference group and regress $DACC^{PM}$ separately on four indicator variables, representing firm-year observations that fall in the remaining three sub-periods and during the break year (labelled *MidES*, *−2Break*, *−1Break* and *Break*). For a sample of 1,138 earnings strings from 1,043 firms between 1989 and 2010, I find that after controlling for the potential effects of covariates the coefficient estimates on *MidES*, $-2Break$ and $-1Break$ are positive and significant in the $DACC^{PM}$ regression. Moreover, both the coefficient estimate and the associated *t*-statistics increase in strength as I move from *MidES* to $-2Break$ and then to $-1Break$. These results suggest that ES firms start to manage their discretionary accruals in the middle of an earnings string and intensify such efforts towards the end. By comparison, the coefficient on the *Break* variable is negative and significant in the $DACC^{PM}$ regression.

All the above results continue to hold when I replicate the analysis separately on the subsets of ES firms that have a single earnings string or firms whose earnings strings last exactly five years. They also remain invariant to the use of alternative proxies for earnings management, i.e., performance-unadjusted and performance-adjusted earnings management measures. This study extends the literature by providing evidence on the progression in the intensity of earnings management within an earnings string and by showing that earnings growth may be artificially sustained through accruals.

The remainder of this paper is organized as follows. Section 2 presents a review of related literature and the development of hypotheses. Section 3 summarizes data collection procedure and the sample. Section 4 presents research design, followed by regression results in Section 5. Section 6 concludes this study.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Burgstahler and Dichev (1997) find that small positive earnings changes occur more frequently than small negative earnings changes. Based on simulations, Myers et al. (2007) also report that the number of firms with a string of non-decreasing earnings for at least 20 quarters is much larger than expected. These findings point to the likely presence of earnings management to avoid earnings declines.

The notion that firms have the ability to sustain an appearance of continued earnings growth through earnings management until it is no longer viable is addressed more formally in two recent studies. Yong (2009) shows that firms with earnings growth for at least three consecutive years tend to use large discretionary accruals in the last two years of earnings strings. Unlike us, Yong (2009) does not speak to the question of whether earnings management in the latter part of an earnings string is different from that in the early part or if there is any change to the pattern of earnings management when an earnings string comes to an end, as the final year of his sample period is allowed to be part of an earnings string.[1] Baik et al. (2008) examine the role of earnings management within an earnings string using quarterly data and find that discretionary accruals increase significantly in four quarters before the break during which the growth in fundamentals starts to decline. A direct comparison of this study with Baik et al. (2008) is difficult however due to differences in research design. In particular, their design is chosen to further examine the role of accounting fundamentals in maintaining an earnings string.[2]

If continuous earning growth is indeed sustained by aggressive earnings management, then firms are more likely to manage earnings upwards using accrual management when an earnings string is near the end, as doing so would allow insiders to postpone the bad news about an upcoming break to the earnings string and sell their shares at a higher price. The above discussion leads to the first hypothesis for the study:

H1: *Ceteris paribus*, ES firms are expected to report larger discretionary accruals near the end of an earnings string, compared to the early part of an earnings string.

Earnings strings normally do not last for an indefinite period of time due to the unpredictability of macroeconomic and firm-specific circumstances. Sustaining the appearance of continued earnings growth through aggressive accrual management can be difficult if earnings become too low, as accruals are typically reversed in the following period. In this case, firms may revert back to "normal" reporting without attempting to manage earnings. Some firms may even opt for overly conservative accounting policies by taking a big-bath and manage earnings downward in order to increase accounting reserve for future period. Either accrual reversal or a big-bath strategy is expected to result in a

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[1] For example, earnings strings that include the final year of his sample period, i.e., 2005, may have ended in 2005 or continued beyond 2005.
[2] The authors acknowledge that some important accounting fundamentals suppressed from their model (e.g., effective tax rates, the number of employees, auditor quality and corporate governance) could not be measured using quarterly data.

significant reduction in discretionary accruals during the year when an earnings string is finally broken, compared to years leading to the break.[3] Thus, I have the next hypothesis for the study:

H2: *Ceteris paribus*, ES firms are expected to report smaller discretionary accruals during the break year, compared to the early part of an earnings string.

3. DATA AND SAMPLE

The initial sample consists of 85,576 firm-year observations over a 22-year (1989-2010) sample period and is obtained by applying the following filters to the COMPUSTAT Fundamental Annual database between 1987 and 2011:[4] First, firms must not belong to the financial and regulated industries. Second, firms must not have missing data required for the earnings management analysis. Third, each two-digit SIC industry-year group must have at least 20 observations to calculate earnings management measures, after deleting earnings changes in the extreme 1 percent of distribution.

Following the convention of Barth et al. (1999), I work with firms that report at least five-year consecutive increases in split-adjusted annual earnings per share. Among the initial sample, 1,417 earnings strings (or 8,932 firm-year observations) fit this definition. I then eliminate 279 strings (or 1,836 firm-year observations)[5] that do not have an identifiable break year to yield a total of 1,138 earnings strings (or 7,096 firm-year observations). Combining these observations with another 1,138 observations from the break year yields the final sample of 8,234 firm-year observations that I use for testing the predictions of Hypotheses 1 and 2 (labelled ES Sample).

Panel A of Table 1 summarizes the above sample filter rules. As is evident in Panel B of Table 1, the ES Sample consists of 1,138 earnings strings from 1,043 distinct firms. Most of the earnings strings represent the first earnings string for a particular firm and only a few are the second string (i.e., 1,043 vs. 95). It would appear that firms rarely succeed in putting together another earnings string following a break to the first string. In total, 948 distinct firms have only one earnings string during the entire sample period and 95 firms have two strings. Panel C presents the frequency distribution by the length of earnings strings. Almost half (46.13 percent) of the ES Sample has strings that last exactly five years and most of the 1,138 earnings strings (96.83 percent) last 10 years or less. The ES Sample is distributed over 35 two-digit SIC industries, where six firms (or 39 firm-year observations) come from the Mining & Construction industries and 172 firms (or 1,428 firm-year observations) are drawn from the Retail industry (see Panel D). This pattern of industry distribution is largely comparable to that for the overall COMPUSTAT population.

[3] It is beyond the scope of this study to distinguish between these two competing arguments.
[4] The two endpoints for the sample period, 1989 and 2010, are chosen because firms must have one- to two-year lag data as well as one-year lead data to calculate model variables and earnings strings. The starting point of 1989 in particular allows us to calculate total accruals using the conceptually superior income statement approach (Hribar and Collins 2002), which requires data from Cash Flow Statement available since 1987.
[5] Among them, 111 come from firms whose earnings strings continued beyond 2010; 93 (3) from firms that have been merged or acquired (bankrupt or liquidated); 66 from firms that no longer file with SEC for other reasons; 3 firms have become private companies; and finally 3are the second string of firms whose first earnings string have been previously excluded due to missing break year.

Table 1. Sample and Data

Panel A: Sample Selection Procedure

	Number of Earnings Strings	Number of Observations
Available observations for calculating earnings strings[a] and model variables (1989–2010) [b]		85,576
Total number of earnings strings (ES)/observations	1,417	8,932
Less: Earnings strings that continue beyond 2010[c]	(111)	(840)
Less: Earnings strings without an identifiable break year[d]	(168)	(996)
Number of earnings strings/observations with clearly identifiable break year (excluding the break year)	1,138	7,096
Number of observations in the break year[e]		1,138
ES sample (1989–2010	1,138	8,234

Notes:

a. An earnings string (ES) is defined as a string of increases in annual EPS (split-adjusted) for at least five years.

b. The initial sample is obtained through the following filters from the COMPUSTAT Fundamental Annual Database between 1987 and 2011: (1) the financial and regulated industries are deleted, (2) any missing data for calculating variables in earnings management analysis are excluded, (3) after trimming earnings changes in the extreme 1 percent of distribution, any two-digit SIC industry-year group with less than 20 observations are also deleted. Since firms must have two-year lag data as well as one-year lead data to calculate model variables and earnings strings in earnings management analysis, the final sample period do not include observations from 1987, 1988, and 2011.

c. Earnings strings are deleted if they continue beyond the final year of the sample period (2010) since the break years of such strings are unknown.

d. Based on DLRSN of COMPUSTAT, 93 firms have been merged or acquired and 3 firms have gone bankrupt or have been liquidated. 3 firms have become private companies while 66 companies no longer file with SEC for other reasons or without reasons. Also, if the first string of a firm is deleted due to missing break year, then its second string is also excluded (3 firms).

e. The break year is included in the original ES sample to test the prediction of Hypothesis 2.

Panel B: Composition of the ES Sample (1989–2010)

	Number	Percentage
Number of 1st earnings string	1,043	91.65%
Number of 2nd earnings string	95	8.35%
Total number of earnings strings	1,138	100.00%
Number of distinct firms with one earnings string	948	90.89%
Number of distinct firms with two earnings strings	95	9.11%
Total number of distinct firms with an earnings string	1,043	100.00%

Panel C: Frequency Distribution of the ES Sample by the Length of Earnings Strings

Length of Earnings Strings	Frequency	Percentage
5	525	46.13%
6	288	25.31%
7	131	11.51%
8	80	7.03%
9	55	4.83%
10	23	2.02%
11	12	1.05%
12	10	0.88%
13	5	0.44%
14	3	0.26%
15	2	0.18%
16	1	0.09%
17	0	0.00%
18	1	0.09%
19	2	0.18%
Total	1,138	100.00%

(Table 1 continued on next page)

(Table 1 continued)

Panel D: Frequency Distribution of the ES Sample by Industry (1989–2010)

Industry (two-digit SIC code)	ES Sample				Compustat Population[a]	
	# of Firms		# of Observations		# of Observations	
	N	%	N	%	N	%
Mining & Construction (01, 10-12,14-19)	6	0.58%	39	0.47%	1,569	1.83%
Oil & Gas (13,29)	47	4.51%	314	3.81%	5,725	6.69%
Food products (20-21)	41	3.93%	344	4.18%	2,551	2.98%
Texitiles (22-27)	70	6.71%	544	6.61%	5,251	6.14%
Chemical products (28)	100	9.59%	839	10.19%	9,417	11.00%
Manufacturing (30-34)	63	6.04%	491	5.96%	5,286	6.18%
Computer equipment (35)	83	7.96%	706	8.57%	6,715	7.85%
Electronic equipment (36)	111	10.64%	843	10.24%	9,223	10.78%
Transportation (37,39-43)	47	4.51%	384	4.66%	3,662	4.28%
Scientific instruments (38)	100	9.59%	782	9.50%	7,153	8.36%
Retail (50-59)	172	16.49%	1,428	17.34%	10,512	12.28%
Services (70-89)	196	18.79%	1,471	17.86%	17,408	20.34%
Other (90-99)	7	0.67%	49	0.60%	1,104	1.29%
Total	1,043	100.00%	8,234	100.00%	85,576	100.00%

Note: a. This population is based on Panel A of Table 1.

4. RESEARCH DESIGN

To test the predictions of Hypotheses 1 and 2, I estimate Equation 1 below by pooling across the ES Sample:

$$DACC_{it}^{PM} = \beta_0 + \beta_1 \bullet MidES_{it} + \beta_2 \bullet -2Break_{it} + \beta_3 \bullet -1Break_{it} + \beta_4 \bullet Break_{it} + \gamma_1 \bullet Size_{it-1} + \gamma_2 \bullet BTM_{it-1} + \gamma_3 \bullet Leverage_{it-1} + \gamma_4 \bullet CFO_{it} + \gamma_5 \bullet Loss_{it-1} + \gamma_6 \bullet NewIssue_{it} + \gamma_7 \bullet Litigation_{it} + \gamma_8 \bullet BigN_{it} + \gamma_j \bullet Industry\ Dummies + \gamma_t \bullet Year\ Dummies + \varepsilon_{it}$$
$$+\beta_{10} \bullet \mathrm{Litigation}_{it} + \beta_{11} \bullet \mathrm{BigN}_{it} + \beta_j \bullet \mathrm{YearDummy} + \beta_k \bullet \mathrm{IndustryDummy} + \varepsilon_{it} \quad (1)$$

where subscripts *i*, *t* and *j* represent sample firm *i* in year *t* and industry *j*. All the continuous control variables in Equation 1 are winsorized at the top and the bottom 1 percent to mitigate the effects of outliers. I use robust standard errors to correct for potential problems associated with heteroskedasticity and firm clustering when reporting *t*-values (Petersen 2009). Definitions and measurements for all the variables in Equation 1 are summarized in Appendix 1.

The dependent variable in Equation 1 is used to proxy for the extent of accrual management. To mitigate potential measurement errors discussed in Kothari, Leone and Wasley (2005), I work with performance-matched discretionary accruals in the main analysis, calculated using a two-step procedure: First, I estimate the following forward-looking modified-Jones model cross-sectionally for each two-digit SIC industry-year group with at least 20 observations over the ES Sample (Dechow, Richardson & Tuna 2003):

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{(1+k)\Delta S_{it} - \Delta REC_{it}}{TA_{it-1}} + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \alpha_4 \frac{TAC_{it-1}}{TA_{it-2}} + \alpha_5 \frac{\Delta AS_{it+1}}{S_{it}} + \varepsilon_{i.t} \quad (2)$$

where *TAC* is total accruals, defined as income before extraordinary items minus cash flows from operating activities; *TA* denotes total assets; ΔS is changes in sales; ΔREC is changes in account receivables from trade; *k* is the estimated slope coefficient from regressing $\Delta REC/TA$ on $\Delta S/TA$ for each two-digit SIC industry-year grouping and is restricted to between zero and one; *PPE* denotes gross property, plant and equipment; *S* denotes sales. Residuals from Equation 2 represent discretionary accruals for sample firm *i* in year *t* (labelled $DACC_{it}$). Second, I match every ES firm with a non-ES firm that has the closest return on assets within the same industry-year group.[6] The performance-matched discretionary accruals for ES firm *i* are its discretionary accruals minus the matched non-ES firm's discretionary accruals (labelled $DACC^{PM}_{it}$).

Model variables in Equation 2 are winsorized at the top and the bottom 1 percent of their respective distributions. Appendix 2 reports the mean values of estimated coefficients in Equation 2 and the associated *t*-statistics calculated using the mean value of standard errors across industry-years and the mean value of adjusted R-square. All the estimated coefficients have the same signs as those in Dechow et al. (2003) and are significant at the conventional levels.

Equation 1 includes four test variables: $MidES_{it}$, set equal to one if a firm-year observation falls in the third year of an earnings string to three years before the break and zero otherwise; $-2Break_{it}$ ($-1Break_{it}$), set equal to one if an observation comes from two years (one year) before the break and zero otherwise; and $Break_{it}$, set equal to one if an observation falls in the break year and zero otherwise. Observations in the first two years of an earnings string serve as the reference group. I do not offer any prediction on the first test variable, $MidES_{it}$. A positive and significant coefficient estimate on each of the next two test variables, $-2Break_{it}$ and $-1Break_{it}$, is consistent with the prediction of Hypothesis 1, whereas the prediction of Hypothesis 2 implies a significantly negative (insignificant) coefficient on the last test variable, $Break_{it}$. In the ensuing discussion and all the tables, I report one-tailed *p*-values if there is a prediction and two-tailed p-values otherwise.

Equation 1 also includes eight control variables found to affect a firm's incentives for accrual management in prior literature:[7] firm size ($Size_{it-1}$), book-to-market ratio (BTM_{it-1}), debt-to-asset ratio ($Leverage_{it-1}$), cash flows from operations (CFO_{it}), prior year loss ($Loss_{it-1}$), new equity issues ($NewIssue_{it}$), litigation risks ($Litigation_{it}$) and audit quality ($BigN_{it}$). Since the sample spans over 22 years (1989–2010) and covers a large number of two-digit SIC industry groups, I also include *Industry* dummies and *Year* dummies in Equation 1 to control for potential industry and year effects. To ease exposition, subscripts *i* and *t* are suppressed throughout subsequent discussions.

5. MAIN RESULT

5.1 Descriptive Statistics

Table 2 presents the distribution of model variables in Equation 1 over the entire ES Sample of 8,234 firm-year observations. The mean value of $DACC^{PM}$ is close to zero (i.e., –0.0143), ranging from –1.8450 to 1.4115. On average, ES firms have positive cash flows (*CFO* = 0.1090), larger market value than book value (*BTM* = 0.4434) and less debts than assets (*Leverage* = 0.1835). Only a few ES firms have reported loss in the previous year (*Loss* = 0.1647) and less than 40 percent of ES firms belong to highly litigious industries (*Litigation* = 0.3594). The vast majority of ES firms issue equity capital in the current period (*NewIssue* = 0.8528) and retain a Big-N auditor (*BigN* = 0.8549).

[6] Return on assets is defined as net income deflated by opening total assets. In the event of ties among multiple non-ES firms, the firm with the closest firm size (i.e., natural logarithm of market value of equity) is selected as the match.

[7] See Cohen and Zarowin (2010); Ball and Shivakumar (2008); Lim and Tan (2008); Barton and Simko (2002); Erickson and Wang (1999); Francis, Maydew and Sparks (1999); Healy and Wahlen (1999); Teoh, Welch and Wong (1998); Dechow, Sloan and Sweeny (1996; 1995); Dechow (1994); Francis, Philbrick and Schipper (1994).

Table 2. Distribution of Model Variables (1989-2010); N = 8,234 firm-year observations).

	Mean	Std Dev	Min	25%	50%	75%	Max	N
$DACC^{PM}$	−0.0143	0.1719	−1.8450	−0.0849	−0.0096	0.0587	1.4115	8,234
Size	5.9940	2.3602	0.6672	4.2906	6.0037	7.6165	11.5930	8,234
BTM	0.4434	0.4062	−0.5754	0.2097	0.3489	0.5660	2.2390	8,234
Leverage	0.1835	0.1824	0.0000	0.0181	0.1491	0.2869	0.9290	8,234
CFO	0.1090	0.1839	−0.8412	0.0660	0.1289	0.1947	0.5111	8,234
Loss	0.1647	0.3709	0.0000	0.0000	0.0000	0.0000	1.0000	8,234
NewIssue	0.8528	0.3543	0.0000	1.0000	1.0000	1.0000	1.0000	8,234
Litigation	0.3594	0.4798	0.0000	0.0000	0.0000	1.0000	1.0000	8,234
BigN	0.8549	0.3523	0.0000	1.0000	1.0000	1.0000	1.0000	8,234

Notes: In Table 2, all continuous variables, except for dependent variable in the earnings management regression ($DACC^{PM}$), are winsorized at the top and the bottom 1 percent of their respective distributions.

Table 3 reports the correlation matrix among pairs of model variables, other than *Industry* and *Year* dummies, in Equation 1. The earnings management measure, $DACC^{PM}$, is negatively associated with *Size*, *CFO* and *BigN*, but positively associated *Leverage* and *Loss*. The pair-wise Pearson correlation coefficients, appearing above the diagonal, are –0.1143, –0.3333, –0.0593, 0.0278 and 0.1145, respectively, all significant at the 5 percent level. Spearman-rank correlation coefficients, appearing below the diagonal in Table 3, exhibit qualitatively similar patterns. While many control variables are highly correlated, un-tabulated results indicate that the largest variance inflation factor and the largest condition index in the $DACC^{PM}$ regression are 1.5665 and 2.2044, respectively. Thus, multicollinearity is unlikely to be a major concern.

Table 3. Correlation Matrix among Model Variables for the ES Sample (1989–2010; N = 8,234 firm-year observations)

	$DACC^{PM}$	*Size*	*BTM*	*Leverage*	*CFO*	*Loss*	*NewIssue*	*Litigation*	*BigN*
$DACC^{PM}$	**1.0000**	−0.1143 <.0001	0.0154 0.1615	0.0278 0.0116	−0.3333 <.0001	0.1145 <.0001	−0.0183 0.0963	0.0077 0.4863	−0.0593 <.0001
Size	−0.1114 <.0001	**1.0000**	−0.3444 <.0001	−0.0297 0.0070	0.3238 <.0001	−0.3832 <.0001	0.1787 <.0001	0.0119 0.2813	0.3670 <.0001
BTM	0.0458 <.0001	−0.3303 <.0001	**1.0000**	−0.0386 0.0005	−0.0304 0.0057	0.0670 <.0001	−0.2447 <.0001	−0.1128 <.0001	−0.0349 0.0016
Leverage	0.0345 0.0017	0.0593 <.0001	0.0980 <.0001	**1.0000**	−0.1221 <.0001	0.1112 <.0001	−0.0898 <.0001	−0.1394 <.0001	−0.0067 0.5439
CFO	−0.3597 <.0001	0.2997 <.0001	−0.2388 <.0001	−0.1879 <.0001	**1.0000**	−0.5296 <.0001	0.0099 0.3675	−0.0211 0.0552	0.1376 <.0001
Loss	0.0971 <.0001	−0.3775 <.0001	−0.0235 0.0328	0.0404 0.0002	-0.4271 <.0001	**1.0000**	−0.0771 <.0001	0.1131 <.0001	−0.1415 <.0001
NewIssue	−0.0166 0.1320	0.1685 <.0001	−0.1863 <.0001	−0.0722 <.0001	0.0533 <.0001	−0.0771 <.0001	**1.0000**	0.1154 <.0001	0.0964 <.0001
Litigation	0.0021 0.8465	0.0092 0.4037	−0.1712 <.0001	−0.1807 <.0001	0.0531 <.0001	0.1131 <.0001	0.1154 <.0001	**1.0000**	−0.0033 0.7662
BigN	−0.0595 <.0001	0.3561 <.0001	−0.0052 0.6384	0.0492 <.0001	0.1175 <.0001	−0.1415 <.0001	0.0964 <.0001	−0.0033 0.7662	**1.0000**

Notes: *Pearson* correlation coefficients are reported above the diagonal and *Spearman* rank correlation coefficients are reported below the diagonal. The corresponding *p*-values appear underneath the correlation coefficients.

5.2 Main Results

Table 4 presents the regression results from estimating Equation 1 over the entire ES Sample of 8,234 firm-year observations. After controlling for the potential effects of covariates, I find that the coefficient estimates on −*2Break* and −*1Break* are all positive and significant at the 1 percent level (one-tailed), whereas that on the *Break* variable is significantly negative at the 1 percent level based on a one-tailed test (−*2Break* = 0.0274, *t*-stat. = 4.48; −*1Break* = 0.0386, *t*-stat. = 5.65; *Break* = –0.0230, *t*-stat. = –3.05; see Panel B). While no prediction is offered on *MidES*, it is also significantly positive at the 5 percent level (two-tailed). Compared to the early part of an earnings string, firms would appear to undertake a progressively higher level of accrual management as I move towards the end of an earnings string but significantly less in the break year, as predicted in Hypotheses 1 and 2.

Table 4. Main Results

$$DACC_{it}^{PM} = \beta_0 + \beta_1 \bullet MidES_{it} + \beta_2 \bullet -2Break_{it} + \beta_3 \bullet -1Break_{it} + \beta_4 \bullet Break_{it} + \gamma_1 \bullet Size_{it-1} + \gamma_2 \bullet BTM_{it-1} + \gamma_3 \bullet Leverage_{it-1} + \gamma_4 \bullet CFO_{it} + \gamma_5 \bullet Loss_{it-1} + \gamma_6 \bullet NewIssue_{it} + \gamma_7 \bullet Litigation_{it} + \gamma_8 \bullet BigN_{it} + \gamma_j \bullet Industry\ Dummies + \gamma_t \bullet Year\ Dummies + \varepsilon_{it}$$

	Prediction	Coefficient	*t*-statistics	*p*-value
Test Variables				
MidES	?	0.0113	2.20	0.0283
−2Break	+	0.0274	4.48	<.0001
−1Break	+	0.0386	5.65	<.0001
Break	−	−0.0230	−3.05	0.0012
Control Variables				
Size		−0.0016	−1.35	0.1758
BTM		0.0027	0.40	0.6920
Leverage		−0.0168	−1.08	0.2825
CFO		−0.3793	−12.66	<.0001
Loss		−0.0428	−5.67	<.0001
NewIssue		−0.0062	−1.19	0.2350
Litigation		−0.0181	−2.77	0.0058
BigN		−0.0065	−0.94	0.3452
Year Dummies		Yes		
Industry Dummies		Yes		
Adj. R^2		13.38%		
N		8,234 obs. (1,043 firms)		

Notes: In Table 4, the dependent variable is $DACC^{PM}$, representing performance-matched discretionary accruals, is defined as the difference between an ES sample firm *i*'s discretionary accruals and the discretionary accruals of a non-ES firm that has the closest return on asset within the same industry-year group. Test variables are *MidES*, *−2Break*, *−1Break*, and *Break*, representing the period from the third year of an earnings string to three years before the break, two years before the break, one year before the break and the break year of an earnings string, respectively. All *t*-values are reported using robust standard errors to correct heteroskedasticity problem and firm clustering effect. The *p*-values are one-tailed if there is a prediction, and two-tailed otherwise.

5.3 Robustness Checks

Recall from Panel B of Table 1 that 95 of the 1,043 ES firms in the ES Sample have two earnings strings during the 22-year (1989–2010) sample period. On the one hand, prior history of earnings strings may subject these ES firms to closer scrutiny from auditors and regulators, reducing their incentives for using earnings management to sustain the second earnings string. On the other hand, one may argue that ES firms with multiple earnings strings likely face heavy pressure from investors to ensure that the second string does not break, as did the previous one. To provide a "cleaner" analysis of earnings management hypothesis, I now replicate Equation 1 on a reduced sample of 948 firms with a single earnings string, or equivalently 6,867 firm-year observations (labelled Subsample 1).[8] As is evident in Panel A of Table 5, all the main regression results continue to hold. In particular, the coefficient estimates on *−2Break* and *−1Break* in both sets of regressions are significantly positive at the 1 percent level (one-tailed), whereas that on the *Break* variable is significantly negative.[9]

In selecting the ES Sample, I have imposed a minimum length of five years on earnings strings, but not an upper bound. Just over half of the ES Sample, or 613 out of 1,138 earnings strings, last from six to 19 years, whereas the remaining 525 earnings strings have a length of exactly five years (see Panel C of Table 1). This implies significant variations in the length of Mid-ES, ranging from one year for a five-year earnings string to 15 years for a 19-year earnings string. To address the concern that the results may be sensitive to cross-sectional variations in the length of Mid-ES, I impose another requirement that all earnings strings have the same length of five years, thus forcing Mid-ES to consist of exactly one year for all firms. This requirement reduces the sample to 505 firms, or equivalently

[8] Subsample 1 is smaller than the original ES sample by 1,367 observations, of which 704 relate to the first earnings string and 663 to the second string.

[9] The coefficient estimates (*t*-stat.) on *MidES*, *−2Break*, *−1Break* and *Break* are 0.0122 (2.07), 0.0278 (4.02), 0.0404 (5.16) and –0.0202 (–2.37), respectively.

3,150 firm-year observations (labelled Subsample 2).[10] Re-estimating Equation 1, I find that the main regression results on −*2Break*, −*1Break* and *Break* continue to hold (see Panel B, Table 5).[11]

Up till now, I have used performance-matched discretionary accruals as the measure of earnings management. While matching each ES firm with a non-ES firm along the industry, year and firm performance dimensions has the advantage of holding constant potential confounding factors that may also contribute to cross-sectional variations in earnings management, this design assumes an equal number of ES and non-ES firms, an assumption that is unlikely to be representative of the actual distribution of the two types of firms in the market. To ensure that my findings remain robust, I replicate all the regression analyses using performance-unadjusted and performance-adjusted accrual management measures, labelled *DACC* and $DACC^{PA}$, respectively. I define *DACC* as residuals from Equation 2 and follow Francis, LaFond, Olsson and Schipper (2005) to define $DACC^{PA}$ as the difference between discretionary accruals of ES firm *i* and the median discretionary accruals of industry-return on assets decile excluding firm *i* (also see Cahan & Zhang 2006).

Results from estimating the *DACC* regression over the entire ES Sample of 8,234 firm-year observations appear in Panel C of Table 5. The corresponding results from estimating the $DACC^{PA}$ regression appear in Panel D. Consistent with the main results, the coefficient estimates on the two key pre-break test variables, −*2Break* and −*1Break*, in both regressions are positive and significant at the 1 percent level (one-tailed). Moreover, the magnitude of coefficient estimate increases as I move from *MidES* to −*2Break* before reaching their peak at −*1Break*.[12] The coefficient estimates on the *Break* variable are significantly negative at the 1 percent level (one-tailed) in both regressions.

Table 5. Results based on Robustness Checks

Panel A. Subsample 1 (One Earnings String Only)

Test Variables	Coeff.	*t*-stat	*p*-value
EM Regression			
MidES	0.0122	2.07	0.0385
−*2Break*	0.0278	4.02	<.0001
−*1Break*	0.0404	5.16	<.0001
Break	−0.0202	−2.37	0.0090
Adj. R^2	12.99%		
N	6,867 obs. (948 firms)		

Panel B. Subsample 2 (Five-Year Earnings String Only)

Test Variables	Coeff.	*t*-stat	*p*-value
EM Regression			
MidES	0.0142	1.50	0.1331
−*2Break*	0.0256	2.67	0.0040
−*1Break*	0.0427	4.08	<.0001
Break	−0.0287	−2.44	0.0075
Adj. R^2	13.13%		
N	3,150 obs. (505 firms)		

(Table 5 continued on next page)

[10] Subsample 2 consists of 2,625 firm-year observations within an earnings string (525 strings x 5 years) and 525 observations from the break year for a total of 3,150. Among the 525 earnings strings, 20 represent the second earnings string for a particular firm. Thus, the number of distinct firms is 505 (525 – 20 = 505).

[11] The coefficient estimates (*t*-stat.) on −*2Break*, −*1Break* and *Break* are 0.0256 (2.67), 0.0427 (4.08) and –0.0287 (–2.44), respectively.

[12] Take the *DACC* regression for example, the coefficient estimates (*t*-stat.) on *MidES*, −*2Break* and −*1Break* are 0.0033 (1.07), 0.0219 (5.39) and 0.0445 (8.78), respectively.

(Table 5 continued)

Panel C. Alternative Measure: Performance-Unadjusted Discretionary Accruals (*DACC*)

Test Variables	Coeff.	*t*-stat	*p*-value
EM Regression			
MidES	0.0033	1.07	0.2871
−2Break	0.0219	5.39	<.0001
−1Break	0.0445	8.78	<.0001
Break	−0.0296	−5.32	<.0001
Adj. R^2	8.78%		
N	8,234 obs. (1,043 firms)		

Panel D. Alternative Measure: Performance-Adjusted Discretionary Accruals ($DACC^{PA}$)

Test Variables	Coeff.	*t*-stat	*p*-value
EM Regression			
MidES	0.0027	0.92	0.3580
−2Break	0.0196	5.28	<.0001
−1Break	0.0388	8.28	<.0001
Break	−0.0264	−5.21	<.0001
Adj. R^2	20.71'%		
N	8,234 obs. (1,043 firms)		

In **Panel A**, Subsample 1 consists of ES firms with only one earnings string (see Panel B of Table 1). In **Panel B**, Subsample 2 consists of ES firms with an earnings string that lasts exactly five years (see Panel C of Table 1). Each panel shows the regression results based on performance-matched discretionary accruals ($DACC^{PM}$). $DACC^{PM}$ is defined as the difference between an ES sample firm *i*'s discretionary accruals and the discretionary accruals of a non-ES firm that has the closest return on asset within the same industry-year group.

Panels C-D report results based on performance-unadjusted discretionary accruals (*DACC*) and those based on performance-adjusted discretionary accruals ($DACC^{PA}$). *DACC* is defined as the residuals from Equation 2 while $DACC^{PA}$ is calculated as the difference between an ES sample firm *i*'s discretionary accruals and the median discretionary accruals for its industry-*ROA* decile excluding firm *i*.

Test variables in **Panels A-D** are *MidES*, *−2Break*, *−1Break*, and *Break*, denoting the period from the third year of an earnings string to three years before the break, two years before the break, one year before the break and the break year of an earnings string, respectively. All *t*-values are reported using robust standard errors to correct heteroscedasticity problem and firm clustering effect. The *p*-values are one-tailed if there is a prediction, and two-tailed otherwise. To conserve the space, results on test variables are reported.

Taken together, I find consistent support for the predictions of Hypotheses 1 and 2. Compared to the early part of an earnings string, ES firms undertake a significantly higher level of accrual starting from the third year of the earnings string until the end, and the intensity of earnings management peaks in the year right before the break. During the break year, ES firms significantly reduce the extent of discretionary accruals from the level in Early-ES. These results extend to cases where I limit ES firms to include those with one earnings string only or firms whose strings last exactly five years. They are also invariant to the choice of proxies for discretionary accruals (i.e., performance-matched vs. performance-unadjusted or performance-adjusted).

6. CONCLUSION

In this paper, I have examined the pattern of earnings management for firms reporting a string of at least five-year consecutive earnings increases (ES firms) over a 22-year (1989–2010) period. Results indicate that ES firms increase the intensity of discretionary accruals as they move towards the end of an earnings string. However, ES firms sharply reduce the level of discretionary accruals when the string finally comes to an end. The pattern of earnings management along an earnings string continues to hold regardless of sample choices (i.e., multiple earnings

strings of varying lengths vs. one earnings string only or five-year earnings strings only) or how I calculate earnings management measures (i.e., performance-matched vs. performance-unadjusted or performance-adjusted).
As directions for future research, it would be interesting to see whether the presence of stock options has any effect on the incentive by managers of ES firms to sustain an earnings string through earnings management and if different patterns of earnings management surrounding the break to an earnings string would emerge when the break is accompanied by CEO changes. It would also be useful to study the characteristics of ES firms that resort to earnings management.

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