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Do changes in the SG&A ratio provide different information about changes in future earnings, analyst forecast revisions, and stock returns under different circumstances?☆,☆☆

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ABSTRACT

In fundamental analysis, increases (decreases) in the ratio of selling, general and administrative (SG&A) costs to sales (SG&A ratio) are perceived as negative (positive) signals regarding future firm performance. However, this interpretation focuses on the overall change in the SG&A ratio and ignores the underlying changes in the components of the ratio (sales and SG&A costs). Although prior research examines the changes in the SG&A ratio under some different circumstances, there is no study that examines all the ways that managers adjust costs in reaction to changes in sales. Therefore, I create six subsamples representing all possible combinations of changes in sales, SG&A costs, and the SG&A ratio and test whether changes in the SG&A ratio are informative about future earnings, analyst forecast revisions, and stock returns under these different circumstances. I find that changes in the SG&A ratio in four of my six subsamples provide information about changes in future earnings. I also find that analysts do not impound all of the information contained in the signals into their forecast revisions and in some cases investors appear to understand this fact.

1. Introduction

Fundamental analysis is primarily concerned with examining changes in specific financial statement items and ratios in an attempt to obtain signals useful for predicting future earnings and firm value. These signals are incrementally informative if they provide information beyond that contained in changes in current earnings. Prior research finds that certain signals are incrementally informative about changes in future earnings, that analysts fail to impound all of the information provided by the signals into their forecast revisions, and that investors seem to recognize that analysts are not fully exploiting this information (Abarbanell & Bushee, 1997; Lev & Thiagarajan, 1993; Ou & Penman, 1989). However, evidence regarding the informativeness of changes in the ratio of selling, general and administrative (SG&A) costs to sales (SG&A ratio) is mixed. Anderson, Banker, Huang, and Janakiraman (2007) suggest that this may be attributable to conflicting information produced by the same signal under different circumstances (e.g., periods of increasing sales versus periods of decreasing sales). However, not all circumstances have been examined. Given this, I partition my sample into subsamples representing all possible combinations of changes in sales, SG&A costs, and the SG&A ratio and test whether changes in the SG&A ratio are informative about future earnings, analyst forecast revisions, and stock returns under these different circumstances.

In fundamental analysis, increases in the SG&A ratio are perceived as the inability of managers to control costs. This inefficiency is expected to negatively impact future performance (Anderson et al., 2007; Lev & Thiagarajan, 1993). Alternatively, decreases in the SG&A ratio are interpreted as a sign of tight managerial control over costs and increased efficiency, which will lead to better future performance. However, early empirical evidence does not generally support this view. For instance, Abarbanell and Bushee (1997) find little association between changes in the SG&A ratio and future earnings changes. In a more recent study, Anderson et al. (2007) explain that the expected impact of changes in the SG&A ratio on future performance, as predicted by fundamental analysis, is valid only if SG&A costs move proportionately with increases and decreases in sales. However, Anderson, Banker, and Janakiraman (2003) find that SG&A costs do not move proportionately

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with changes in sales. Instead, they find that SG&A costs decrease less when sales decrease than they increase when sales increase, a type of cost behavior they label "sticky." Anderson et al. (2007) hypothesize that sticky costs may be the deliberate retention of SG&A resources, by managers, in expectation of increases in future sales. They find that increases in the SG&A ratio, in times of declining sales, are positively related to changes in future earnings, a finding that is inconsistent with the traditional interpretation of the SG&A ratio per fundamental analysis.

Although the partitioning by changes in sales in Anderson et al. (2007) provides incremental information regarding future firm performance, it does not examine whether changes in both of the components of the SG&A ratio (sales and SG&A costs) create different information environments. If cost stickiness is the only factor in determining how costs respond to changes in sales, then we should only observe increases in SG&A costs as sales increase and decreases in SG&A costs as sales decrease. However, I document that managers behave in ways that appear to be conscious decisions beyond what cost stickiness predicts, including cutting SG&A costs when sales increase and increasing SG&A costs when sales decrease. It is important to consider why managers might be making these decisions and what impact they may have on future performance. Baumgarten, Bonenkamp, and Homburg (2010) demonstrate the importance of this point by arguing that it is crucial to distinguish whether an increase in the SG&A ratio is actually intended by management, and they find that these intentional increases enhance future earnings. However, similar to other studies in this research stream, Baumgarten et al. (2010) only examine changes in the SG&A ratio and do not specifically consider all the ways managers can react (i.e., adjusting SG&A costs) to increases and decreases in sales and the impact of those reactions. This study fills that void.

The SG&A ratio is affected by both sales and SG&A costs. In periods where sales and SG&A costs move in the same direction (i.e., both increase or both decrease, as predicted by the concept of sticky costs), the SG&A ratio can either increase or decrease, because it is a function of the relative changes to the separate components. For instance, in a period where sales and SG&A costs both increase, if sales increase by more than SG&A costs, then the SG&A ratio will decrease, and if sales increase by less than SG&A costs, then the SG&A ratio will increase. On average, Anderson et al. (2003) find that SG&A costs increase 0.55% per 1% increase in sales and decrease 0.35% per 1% decrease in sales. This does not explain the firm-years where SG&A costs are increasing (decreasing) more than the increases (decreases) in sales, nor does it explain the firm-years that sales and costs move in opposite directions.

In general, increasing sales is a favorable signal about firm performance. However, when sales increase, changes in the SG&A ratio are an ambiguous signal about firm performance. When increasing sales are accompanied by decreasing SG&A costs, current period earnings will be higher and may signal improving efficiency. Alternatively, decreasing SG&A costs may signal that managers are reducing expenses because they expect future demand to be lower. There is an analogous ambiguity relating to changes in the SG&A ratio when sales are decreasing. Decreasing SG&A costs might be viewed as preferable to increasing SG&A costs, but the perceived decrease in efficiency in this scenario could actually be a signal that managers expect higher future demand and are thus increasing SG&A expenditures.

These different scenarios make interpretation of changes in SG&A ratios difficult. For instance, soon after becoming the Chief Financial Officer of Best Buy, Sharon McCollam said, "early observations are that the SG&A infrastructure at Best Buy is too high" (Ryan, 2013). Although sales are decreasing and Best Buy plans to cut $400 million from its SG&A expense, "it appears the cuts will only offset additional expenses Best Buy has to make to boost sales and compete with low-overhead online retailers" (Ryan, 2013). The Best Buy situation is an example of a firm with decreasing sales and an increasing SG&A ratio, with the latter being a conscious decision made in an effort to improve future performance, rather than an example of a firm that has lost control of its spending. Without complete information regarding management's intentions, investors can be left with the difficult task of interpreting the changes on their own. It is unclear whether Best Buy's strategy will successfully increase future firm performance, but it does demonstrate the difficulty in interpreting changes in the SG&A ratio in different information environments.

Anderson et al. (2007) began to explore this idea of the SG&A signal having different implications under different circumstances by partitioning their sample into periods of increasing versus decreasing sales. Because changes in the components of the SG&A ratio may create different information environments that condition the signal of changes in the SG&A ratio, in this study, I extend Anderson et al. (2007) by identifying subsamples of firm-years with all possible combinations of changes in the SG&A ratio and its components. I then examine whether changes in the SG&A ratio, in these different circumstances, provide information about future performance and whether analysts and market participants fully understand the information provided by the signals.

To conduct my analyses, I construct a sample of 38,737 firm-year observations from 1990 through 2010. I then partition the full sample into six mutually exclusive subsamples based on changes in the SG&A ratio, changes in sales, and changes in SG&A costs, from $t-1$ to t. Finally, I assess the associations between the changes in the SG&A ratio (for each of the six subsamples) and changes in future earnings, analyst forecast revisions, and stock returns. Fig. 1 presents the composition of the six subsamples.

Subsample 1 is firm-year observations with increases in both sales and SG&A costs and a decreasing SG&A ratio, indicating that sales are rising faster than costs. These observations conform to the cost stickiness evidence presented in Anderson et al. (2003), and there is an expectation, based on the prediction of fundamental analysis, that increasing sales and better efficiency (i.e., decreasing SG&A ratio) are signaling better future performance. Subsample 2 is firm-year observations with an increase in sales and a decrease in SG&A costs, leading to a decrease in the SG&A ratio. These observations do not conform to the cost stickiness evidence in Anderson et al. (2003) because costs are not increasing with the increase in sales. However, based on the prediction of fundamental analysis, a decreasing SG&A ratio is a signal of better future performance. Subsample 3 is firm-year observations with decreases in both sales and SG&A costs and a decreasing SG&A ratio, indicating that costs are falling faster than sales. These observations also do not conform to the cost stickiness evidence in Anderson et al. (2003) because costs are decreasing faster than sales. However, based on the prediction of fundamental analysis, a decreasing SG&A ratio is a signal of better performance. Subsample 4 is firm-year observations with increases in sales, SG&A costs, and SG&A ratio, indicating that costs are rising faster than sales. These observations also do not conform to the cost stickiness evidence in Anderson et al. (2003) because costs are increasing faster than sales. However, based on the prediction of fundamental analysis, an increasing SG&A ratio is a signal of worse future performance. Subsample 5 is firm-year observations with decreasing sales and increasing SG&A costs, leading to an increase in the SG&A ratio. Based on the prediction of fundamental analysis, an increasing SG&A ratio is a signal of worse future performance. However, Anderson et al. (2007) present evidence that firm-years with decreasing sales and

	Subsample 1	Subsample 2	Subsample 3	Subsample 4	Subsample 5	Subsample 6
SG&A Ratio	-	-	-	+	+	+
Sales	+	+	-	+	-	-
SG&A Costs	+	-	-	+	+	-

Fig. 1. Subsamples 1 through 6 composition.

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increasing SG&A ratio are a signal of better future performance. Their rationale is based on the fact that, during times of falling sales, managers keep resources in place in expectation of increasing demand in the future. Therefore, there is an expectation of better future performance. Finally, Subsample 6 is firm-year observations with decreasing sales, decreasing SG&A costs, and an increasing SG&A ratio, indicating that sales are falling faster than costs. Similar to Subsample 5, and because of the evidence presented in Anderson et al. (2007), there is an expectation that this is a signal of better future performance.

For Subsample 1, I find that decreases in the SG&A ratio signal worse future performance, which is contrary to the prediction of fundamental analysis, and suggests that perhaps managers do not recognize that future sales may decrease and do not respond by properly cutting SG&A costs in anticipation of this decrease. As predicted, for Subsample 2, I find that decreases in the SG&A ratio signal better future performance. For Subsample 3, I find that decreases in the SG&A ratio are not associated with future performance, which does not support the prediction of fundamental analysis.[1] As predicted, for Subsample 4, I find that increases in the SG&A ratio signal worse future performance. For Subsample 5, I find that increases in the SG&A ratio are not associated with future performance, which does not support the prediction based on the findings in Anderson et al. (2007), and suggests that the findings do not hold in periods of both increasing SG&A ratio *and* increasing SG&A costs. Finally, for Subsample 6, I find that increases in the SG&A ratio signal better future performance, which supports the findings in Anderson et al. (2007) that managers make intentional decisions to retain resources in times of declining sales with the expectation that demand will increase in the future.

Although Weiss (2010) finds that firms with stickier costs have less accurate analysts' forecasts than firms with less sticky costs, and that investors seem to consider sticky cost behavior in firm valuation, I do not make predictions for analyst forecast revisions and abnormal stock returns, specifically because I am not partitioning my sample into sticky cost versus non-sticky cost firms. However, if both analysts and investors understand the implications of changes in the SG&A ratio and its components, then the results should mirror the results related to changes in future earnings.

In tests related to analyst forecast revisions, I find that analysts seem to understand the information contained in changes in the SG&A ratio and incorporate this information into their forecast revisions in only two of my subsamples (Subsample 2 and Subsample 6). This is not surprising for Subsample 2, given that changes in future earnings follow the prediction of fundamental analysis. However, Subsample 6 does not follow the prediction of fundamental analysis, but analysts appear to understand that managers are deliberately retaining resources during periods of declining sales in expectation of sales rebounding in the future. In Subsample 1 and Subsample 4, they do not appear to recognize the information provided by the change in the SG&A ratio, and they do not incorporate the information into their forecast revisions. This is not surprising for Subsample 1, given that changes in future earnings do not follow the prediction of fundamental analysis, and it appears that analysts do not expect this. For Subsample 4, changes in future earnings follow the prediction of fundamental analysis, but analysts do not appear to react to the impending decline in future earnings, perhaps fixating too much on the increase in sales. Finally, in Subsample 3 and Subsample 5, they appear to make forecast revisions as though there is a relation between changes in the SG&A ratio and future performance, even though I find no relation between the two in these subsamples. Again, this is not surprising, given that analysts have expectations, based on the prediction of fundamental analysis, for changes in future earnings that do not come to fruition.

Finally, I find a negative relation between changes in the SG&A ratio and abnormal stock returns in Subsample 1 and Subsample 4. This indicates that the market is correctly able to identify the signal of worse future performance for both subsamples. I also find a positive relation between changes in the SG&A ratio and abnormal stock returns in Subsample 2, Subsample 3, and Subsample 6; however, the relation is subsumed by the information contained in forecast revisions for Subsample 2. For Subsample 2, the market is correctly identifying better future performance but only because of the forecast revision signal. For Subsample 3, the market is assuming better future performance that does not take place. For Subsample 6, the market is correctly able to identify the signal of better future performance. In Subsample 5, I find a negative relation between changes in the SG&A ratio and abnormal stock returns, but only when controlling for forecast revisions.

This study contributes to the stream of literature on fundamental analysis and SG&A costs by performing a more detailed breakdown of changes in the SG&A ratio and by demonstrating that this partitioning provides incremental information about changes in future earnings, analyst forecast revisions, and future stock returns. My results also indicate that managers' adjustments of SG&A costs, in response to changes in sales, are extremely important. These results should be of interest to investors because they reveal that the information content of changes in the SG&A ratio varies under different circumstances. Additionally, I demonstrate that changes in the SG&A ratio and its components can help to identify firms that will experience higher future earnings and higher future stock returns. Finally, my results should be of interest to accounting researchers considering the implications of changes in the SG&A ratio and examining the informativeness of fundamental signals in different information environments.

My paper proceeds as follows. Section 2 reviews prior evidence from the fundamental analysis and SG&A costs literature. Section 3 describes my sample, variable definitions, and research design. Section 4 presents my empirical results. Section 5 concludes.

2. Background

Valuation research focuses on the use of accounting information to estimate firm value. According to Lee (1999, 415), "The essential task in valuation is forecasting." He continues, "Fundamental analysis may be viewed as the art of using existing information, such as historical statements, to make better forecasts." Penman (1992, 471) echoes this sentiment and outlines the role of financial statement/fundamental analysis in empirical accounting research by stating, "the task of research is to discover what information projects future earnings and, from a financial statement analysis point of view, what information in the financial statement does this."

Empirical research attempting to identify relevant financial statement information includes Ou and Penman (1989), who identify financial statement attributes that are associated with future payoffs and combine them into one "positive-value measure" (Ou and Penman 1989, 297). Lev and Thiagarajan (1993) extend this idea by identifying candidate fundamentals from the written pronouncements of financial analysts. They specifically search the *Wall Street Journal*, *Barron's*, *Value Line* publications on "quality of earnings," professional commentaries on corporate financial reporting and analysis, and newsletters of major securities firms commenting on the value-relevance of financial information.[2] They

[1] By construction, three of my six subsamples (1, 2 and 3) contain firm-year observations with decreases in the SG&A ratio from *t*-1 to *t*. Based on the tenets of fundamental analysis, larger decreases in the ratio indicate larger increases in efficiency. However, these larger decreases are represented by larger *negative* numbers, which makes interpretation difficult. In order to simplify the interpretation of my findings for these subsamples, I multiply the change in the SG&A ratio by −1, so that larger decreases in the ratio (i.e., larger increases in efficiency per fundamental analysis) are larger *positive* numbers. Therefore, a positive (negative) sign on the coefficients in my tables indicates that larger (smaller) decreases in the SG&A ratio result in better (worse) future performance.

[2] The twelve signals they identify are changes in inventory, changes in accounts receivable, changes in capital expenditures, changes in research and development, changes in gross margin, changes in sales and administrative expenses, changes in provision for doubtful receivables, changes in effective tax rate, changes in order backlog, changes in labor force, whether a firm uses LIFO or FIFO, and whether a firm has a qualified or unqualified audit opinion.

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state that their search procedure, which is guided by theory and experts' judgment, is superior to the statistical search method used in Ou and Penman (1989). Abarbanell and Bushee (1997) use nine of the fundamentals identified by Lev and Thiagarajan (1993) and examine whether changes in the fundamental signals are informative about subsequent earnings changes. They find that seven of the nine signals are significantly related to the one-year-ahead change in earnings. However, one of their signals that is not statistically significant is "selling and administrative expenses (S&A)."[3]

Anderson et al. (2007) examine this lack of statistical significance between SG&A costs and one-year-ahead change in earnings and offer a possible explanation for this finding. They note that fundamental analysis interprets an increase in the SG&A ratio as a negative signal about future profitability and firm value. However, findings in Anderson et al. (2003) point out that cost accounting relies on the fundamental assumption that the relation between cost and volume is symmetric for volume increases and decreases, but this assumption has never been empirically tested. They test this idea and find that SG&A costs increase more when sales increase than they decrease when sales decrease by an equivalent amount. They label this type of cost behavior "sticky," and find empirical support for the idea that "stickiness" is caused by managers recognizing that decreasing sales do not necessarily lead to permanent decreases in demand. Managers respond to this by maintaining costs, in the hope that sales rebound. Anderson et al. (2007) suggest that these "sticky costs" might offer an explanation for why increases in the SG&A ratio are not always a negative signal and why Abarbanell and Bushee (1997) find no association between changes in the SG&A ratio and the one-year-ahead change in earnings. Anderson et al. (2007) hypothesize that both the stickiness and the fixed nature of some costs could cause the SG&A ratio to increase when sales are decreasing. In cases where managers maintain costs hoping that sales rebound, an increase in the SG&A ratio might actually convey positive information about future performance, in direct contrast to the common assumption of fundamental analysis. Anderson et al. (2007) test this hypothesis and find that increases in the SG&A ratio signal better future performance in periods of decreasing sales. Additionally, Baumgarten et al. (2010) argue that it is crucial to distinguish whether an increase in the SG&A ratio is actually intended by management, and they find that these intentional increases enhance future earnings. However, similar to other studies in this research stream, Baumgarten et al. (2010) only examine changes in the SG&A ratio and do not consider how managers react (i.e., adjusting SG&A costs) to increases and decreases in sales.

This finding—that changes in the SG&A ratio provide different information in different circumstances—suggests that a partitioning of changes in the SG&A ratio and its components might provide information that signals better projections of future earnings and thus allows for more accurate assessments of firm value. Furthermore, by following the methodology in Abarbanell and Bushee (1997) and examining the direct relation between fundamental signals and future earnings, I am able to assess how efficiently analysts use these signals. Finally, I can also test for associations between changes in the SG&A ratio and future stock returns to determine whether these changes convey value-relevant information beyond the information incorporated by analysts into their forecast revisions under different circumstances.

Weiss (2010) examines how sticky cost behavior affects analysts' earnings forecasts. He finds that firms with stickier cost behavior has less accurate forecasts than firms with less sticky cost behavior. Additionally, he finds that investors appear to consider sticky cost behavior when forming their beliefs about firm valuation.

More recent studies in the SG&A costs literature stream include Kama and Weiss (2013), who suggest an alternative explanation for firm cost structures. They theorize that when managers face incentives to avoid losses and decreases in earnings, or feel pressure to meet or beat analysts' earnings forecasts, they will cut slack resources during times of decreasing sales, even if they believe the decrease in sales will be temporary. This decision would lessen the degree of cost stickiness, rather than induce it. They test this theory and find that when sales decrease, managers cut costs more aggressively in the presence of incentives to avoid losses, to avoid decreases in earnings, and to meet or beat analysts' earnings forecasts.

Similarly, Chen, Lu, and Sougiannis (2012) explore alternative explanations for cost stickiness based on managerial incentives. They question whether SG&A costs asymmetry is positively associated with the agency problem and whether strong corporate governance mitigates the association. They find that cost asymmetry increases with managers' empire building incentives, and they suggest this is an alternative explanation to the sticky cost theory suggested by Anderson et al. (2003). Additionally, they find that the positive association between SG&A costs asymmetry and the agency problem is mitigated by the presence of strong corporate governance.

Cannon (2014) examines the determinants of sticky costs and finds that managers not only adjust capacity in response to changes in sales, but they also adjust prices. This adds further credence to the idea that managers respond to changes in sales in ways that are not completely explained by the concept of sticky costs. Balakrishnan, Labro, and Soderstrom (2014) also find that past decisions on cost structure confound results usually interpreted as cost stickiness and suggest that long-run cost decisions negatively impact researchers' ability to detect short-term cost management decisions. Similarly, Banker, Byzalov, Ciftci, and Mashruwala (2014) find that cost stickiness is affected by prior changes in sales, and Banker, Basu, Byzalov, and Chen (2016) find that cost stickiness has a confounding effect on conditional conservatism, adding further complexity to the determinants of sticky costs and the potential impacts on changes in future earnings and the way that both analysts and the market view changes in the SG&A ratio.

This stream of research suggests a continuing interest in cost structures, sticky costs, explanations for the asymmetric response and the information content of changes in the SG&A ratio. Additionally, the alternative explanations for cost stickiness suggest that different outcomes might arise in different circumstances, in which case, further examination and partitioning of the SG&A costs signal is warranted. My study contributes to the SG&A costs literature by re-examining the findings from prior studies over a more recent sample period and by exploring firms with increasing versus decreasing SG&A ratios, increasing versus decreasing sales, and increasing versus decreasing SG&A costs, to increase our knowledge of the information content of changes in the SG&A ratio, given that some of the changes in the underlying components of the SG&A ratio appear to be deliberate choices by managers that do not conform to traditional beliefs.

3. Sample, variable definitions, and research design

3.1. Sample

To examine the relation between changes in the SG&A ratio and future earnings, analyst forecast revisions, and stock returns, I first identify all firm-year observations from the Compustat database between 1987 and 2010 with sufficient data available to calculate all required variables. I eliminate firms in the financial services industry (SIC codes 6000 to 6999) because of differences in interpreting financial reports between these industries and other industries (Subramanyam, 1996). Because some variables require data from three years prior and one year ahead, I obtain a sample of 38,737 firm-year observations with an actual sample period of 1990 to 2011. I obtain forecast data from the Institutional Brokers' Estimate System (I/B/E/S) for the same sample period, and my sample for tests on analyst forecast revisions is 11,030 firm-year observations. Finally, I obtain data from the Center for

[3] Although Abarbanell and Bushee (1997) adopt the variable name "selling and administrative expenses (S&A)" from Lev and Thiagarajan (1993), their "S&A" contains the same information as my "SG&A."

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Table 1
Descriptive statistics on historical SG&A ratio.

	Firm-year observations	Mean SG&A ratio (%)	Median SG&A ratio (%)	Lower quartile (%)	Upper quartile (%)	Standard deviation (%)
1990	1717	30.30	23.66	13.68	37.91	26.32
1991	1719	30.50	23.97	14.01	37.82	25.98
1992	1775	30.05	23.29	13.64	36.73	26.66
1993	1810	29.99	23.35	13.57	36.67	26.51
1994	1657	28.98	22.41	12.63	35.16	26.19
1995	1658	29.37	22.53	12.34	35.55	26.76
1996	1755	30.96	22.92	12.71	36.90	29.48
1997	1749	32.51	23.82	12.61	38.81	31.31
1998	1880	37.20	26.39	14.10	44.18	35.66
1999	1756	35.90	24.74	13.82	41.13	35.12
2000	1660	37.18	24.59	13.74	42.77	37.44
2001	1727	41.81	27.19	15.26	51.42	39.74
2002	1654	42.65	28.87	16.02	55.65	38.90
2003	1718	41.48	28.91	15.68	53.60	37.86
2004	1832	39.94	27.85	15.31	50.17	37.22
2005	2158	40.03	27.83	14.81	49.46	38.06
2006	2432	39.67	26.88	14.56	49.41	37.89
2007	2600	37.63	26.32	13.93	47.19	35.77
2008	2771	36.21	26.00	13.20	45.80	34.08
2009	2709	36.21	26.30	14.35	45.55	32.80
Total	38,737	35.65	25.21	14.01	43.10	33.84

Table 2 (Panel A)
Descriptive statistics of full sample.

	Full sample
CEPS	0.082
CEPS1	0.057
FR	0.109
BHAR	−0.022
SG&A ratio	0.357
ΔSG&A ratio	0.173
Sales	2035.010
ΔSales	93.170
SG&A	306.099
ΔSG&A	18.443
INV	203.825
ΔINV	−0.003
AR	316.753
ΔAR	−0.004
CAPX	145.635
ΔCAPX	0.400
GM	709.393
ΔGM	−0.001
TR	0.167
ETR	−0.020
LF	−0.112
LEV	0.449
ΔLEV	−0.018
SG	−0.090
N	38,737

Research in Securities Prices (CRSP) monthly files, and my sample for tests on annual stock returns is 11,929 firm-year observations. I also winsorize all variables at the top and bottom 1% of the distribution to eliminate extreme observations. I perform the multivariate analyses that follow using the maximum number of observations with complete data available for each test. Because of this, the number of observations varies across specifications.

For descriptive purposes, and for the multivariate tests that follow, I partition my full sample into six mutually exclusive subsamples. Fig. 1 details the composition of these subsamples. Subsample 1 is composed of 11,552 firm-year observations with decreasing SG&A ratio, increasing sales and increasing SG&A costs from $t-1$ to t. Subsample 2 is composed of 4359 firm-year observations with decreasing SG&A ratio, increasing sales and decreasing SG&A costs. Subsample 3 is composed of 3510 firm-year observations with decreasing SG&A ratio, decreasing sales and decreasing SG&A costs. Subsample 4 is composed of 9584 firm-year observations with increasing SG&A ratio, increasing sales and increasing SG&A costs. Subsample 5 is composed of 4835 firm-year observations with increasing SG&A ratio, decreasing sales and increasing SG&A costs. Finally, Subsample 6 is composed of 4897 firm-year observations with increasing SG&A ratio, decreasing sales and decreasing SG&A costs.

Table 1 presents historical descriptive statistics for the SG&A ratio over the sample period. The full sample of 38,737 firm-year observations has a mean (median) SG&A ratio of 35.65% (25.21%) for 1990 to 2009, with a low mean (median) of 28.98% (22.41%) in 1994 (1994) and a high mean (median) of 42.65% (28.91%) in 2002 (2003).

Table 2 (Panel A and Panel B presents descriptive statistics for all dependent and independent variables used in the multivariate analyses that follow, for the full sample (Panel A) and subsamples detailed in Fig. 1 (Panel B).[4]

3.2. Empirical models

I follow a modified version of the model in Abarbanell and Bushee (1997) and estimate the following regression to examine the relation between changes in the SG&A ratio and one-year-ahead earnings change ($CEPS1_{i,t}$)[5]:

$$CEPS1_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma \gamma_{ij} Other\ Signals_{ij} + \varepsilon_{i,t} \quad (1)$$

I eliminate two fundamental signals used in Abarbanell and Bushee (1997). The first is audit qualification, because more than 99% of the observations have unqualified audit opinions, and the second is earnings quality, because the data source has a high variability in the number of observations by year, calling into question the reliability of the information provided during my sample period. I partition the full sample into subsamples based on all possible combinations of changes in the SG&A ratio and its components, to test for a relation between changes in the SG&A ratio and one-year-ahead earnings under these different circumstances. If β_1 is positive (negative) and significant, this indicates that larger decreases in the SG&A ratio during a period of decreasing SG&A ratio, increasing sales and increasing SG&A costs, signals better (worse) future performance. If β_2 is positive (negative) and significant, this indicates that larger decreases in the SG&A ratio during a period of decreasing SG&A ratio, increasing sales and decreasing SG&A costs, signals better (worse) future performance. If β_3 is positive (negative) and significant, this indicates that larger decreases in the SG&A ratio during a period of decreasing SG&A ratio, decreasing sales and decreasing SG&A costs signals better (worse) future performance. If β_4 is positive (negative) and significant, this indicates that larger increases in the SG&A ratio during a period of increasing SG&A ratio, increasing sales

[4] See Appendix A for variable definitions.

[5] In untabulated results, I replicate the main test from Abarbanell and Bushee (1997) for my sample period, using overall change in the SG&A ratio as my variable of interest, rather than partitioning the full sample into six subsamples. I find a significant and positive association between changes in the SG&A ratio and one-year-ahead earnings change, whereas Abarbanell and Bushee (1997) found no association. This positive association is counter to the prediction offered by fundamental analysis regarding how changes in the ratio should affect future earnings and suggests a shift has occurred since Abarbanell and Bushee's (1997) sample period. Additionally, I replicate the test from Anderson et al. (2007) for my sample period, partitioning the full sample into periods of increasing and decreasing sales. I find a significant and positive association between changes in the SG&A ratio and one-year-ahead earnings change in periods of decreasing sales and no association in periods of increasing sales, confirming that the results of Anderson et al. (2007) hold in my sample period.

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Table 2 (Panel B)
Descriptive statistics of subsamples 1 through 6.

	Subsample 1	Subsample 2	Subsample 3	Subsample 4	Subsample 5	Subsample 6
CEPS	0.075	0.288	0.307	0.003	−0.067	0.054
CEPS1	0.012	0.072	0.132	0.008	0.084	0.161
FR	0.077	0.176	0.234	0.073	0.128	0.177
BHAR	−0.080	0.060	0.205	−0.092	−0.005	0.141
SG&A ratio	0.318	0.374	0.366	0.310	0.437	0.436
ΔSG&A ratio	−0.115	−0.240	−0.130	0.119	0.912	0.817
Sales	2205.920	1406.200	2023.460	2565.860	1409.700	1778.290
ΔSales	231.041	77.838	−87.323	200.257	−61.280	−146.136
SG&A	319.140	176.414	295.505	427.099	191.878	274.335
ΔSG&A	30.829	−9.155	−24.535	52.739	12.683	−16.841
INV	212.909	122.325	205.898	259.082	144.009	204.369
ΔINV	−0.014	−0.020	−0.002	−0.001	0.015	0.018
AR	335.715	196.680	394.093	376.579	230.484	291.561
ΔAR	−0.015	−0.014	−0.002	−0.003	0.009	0.014
CAPX	162.005	105.108	131.429	176.102	116.035	122.869
ΔCAPX	1.206	0.069	−1.577	1.519	−0.087	−1.498
GM	778.108	434.931	703.376	963.399	427.789	576.834
ΔGM	0.006	0.021	−0.001	0.004	−0.031	−0.015
TR	0.208	0.185	0.241	0.138	−0.001	0.221
ETR	−0.008	−0.006	−0.025	−0.011	−0.039	−0.054
LF	−0.253	−0.284	−0.052	−0.073	0.072	0.076
LEV	0.410	0.503	0.497	0.476	0.417	0.442
ΔLEV	−0.045	−0.036	−0.025	−0.014	0.058	−0.022
SG	0.110	0.039	−0.179	−0.078	−0.360	−0.368
N	11,552	4359	3510	9584	4835	4897

and increasing SG&A costs, signals better (worse) future performance. If β_5 is positive (negative) and significant, this indicates that larger increases in the SG&A ratio during a period of increasing SG&A ratio, decreasing sales and increasing SG&A costs, signals better (worse) future performance. Finally, if β_6 is positive (negative) and significant, this indicates that larger increases in the SG&A ratio during a period of increasing SG&A ratio, decreasing sales and decreasing SG&A costs, signals better (worse) future performance.

I follow a modified version of a model in Abarbanell and Bushee (1997) and estimate the following regression to examine the relation between changes in the SG&A ratio and analyst forecast revisions ($FR_{i,t}$)[6]:

$$FR_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma\gamma_{ij} Other\ Signals_{ij} + \varepsilon_{i,t} \quad (2)$$

Abarbanell and Bushee (1997) identify the fundamental signals in their models, including SG&A ratio, as those that analysts mention as most important when forming their annual forecasts. Unless analysts anticipate the information contained in the fundamental signals more than one year prior to the realization of the signals, then analyst forecast revisions should be related to the fundamentals in the same way they are related to future earnings changes. Therefore, if the coefficients are significant in the same direction as the tests examining the relation between changes in the SG&A ratio and one-year-ahead earnings, this suggests that analysts are efficiently impounding the information in the signals into their forecast revisions. Alternatively, if the coefficients are significant and in the opposite direction, this suggests that analysts are interpreting the signal the opposite of what the new information suggests. If the coefficients are insignificant, it suggests that analysts are not using the information in the signals when calculating their forecast revisions.

Finally, I estimate the following regressions to examine the relation between changes in the SG&A ratio and buy-and-hold abnormal returns ($BHAR_{i,t}$):

$$BHAR_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma\gamma_{ij} Other\ Signals_{ij} + \varepsilon_{i,t} \quad (3)$$

$$BHAR_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma\gamma_{ij} Other\ Signals_{ij} + \beta_7 FR_{i,t} + \varepsilon_{i,t} \quad (4)$$

By first estimating the equation without analyst forecast revisions ($FR_{i,t}$), I can test whether the information provided by the change in the SG&A ratio is priced in the market. I then estimate the equation with analyst forecast revisions ($FR_{i,t}$) to determine the extent to which information provided by the change in the SG&A ratio that is priced in the market is contained in analyst forecast revisions. If the coefficients on my variables of interest remain significant in the presence of analyst forecast revisions, then this suggests that analysts do not fully impound the information contained in these variables, and further suggests that investors recognize this fact.

4. Empirical results

4.1. The relation between changes in the SG&A ratio and future earnings

In this section, I examine the relation between changes in the SG&A ratio and changes in one-year-ahead changes in earnings. Table 3 presents results from the regression relating changes in the SG&A ratio to one-year-ahead changes in earnings. Eq. (1) examines whether changes in the SG&A ratio have different information properties during periods with different combinations of changes in the SG&A ratio, sales, and SG&A costs, as represented by my six subsamples. The coefficient on *SS_1* is negative and significant at the 1% level, indicating that decreases in the SG&A ratio are associated with lower one-year-ahead changes in earnings in periods where the SG&A ratio is decreasing, and both sales

[6] In untabulated results, I replicate a secondary test from Abarbanell and Bushee (1997), using overall changes in the SG&A ratio as my variable of interest, and I find a significant and positive association between changes in the SG&A ratio and analyst forecast revisions. This association is the same as the association between changes in the SG&A ratio and one-year-ahead earnings change, suggesting that analysts are efficiently impounding the information contained in the signal into their forecast revisions. I also follow Anderson et al. (2007) and partition the full sample into periods of increasing and decreasing sales. I find a significant and positive association between changes in the SG&A ratio in periods of decreasing sales and no association in periods of increasing sales. These associations are the same as the associations between changes in the SG&A ratio and one-year-ahead earnings change, suggesting that analysts are efficiently impounding the information contained in the signal into their forecast revisions in these two different circumstances.

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Table 3
Regressions of one-year-ahead change in EPS on subsamples 1 through 6.

	EQ(1)
DV = *CEPS1*	
Intercept	0.0516***
	(<.0001)
SS_1	−0.1660***
	(<.0001)
SS_2	0.0876***
	(0.0011)
SS_3	0.0171
	(0.3515)
SS_4	−0.0216**
	(0.0430)
SS_5	0.0019
	(0.1086)
SS_6	0.0016***
	(0.0001)
CEPS	−0.0061
	(0.5041)
ΔINV	−0.2215***
	(<.0001)
ΔAR	−0.0257
	(0.4066)
ΔCAPX	−0.0003***
	(<.0001)
ΔGM	−0.1681***
	(<.0001)
ETR	−0.0496***
	(<.0001)
LF	−0.0450***
	(<.0001)
ΔLEV	−0.0014
	(0.1802)
Growth	−0.0259***
	(<.0001)
N	38,737
Adj R^2	1.998%

***, **, * denotes statistical significance at <.01, <.05, and <.10 levels, respectively, for two-tailed tests. *P*-values provided in parentheses.

and SG&A costs are increasing. Once again, this is contradictory to the general interpretation of the SG&A ratio in fundamental analysis and suggests that perhaps managers in this set of circumstances are not able to properly identify impending decreases in sales. If managers increase SG&A costs, expecting sales to continue increasing, then flat or decreasing sales in the future could be contributing to worse future performance. The coefficient on *SS_2* is positive and significant at the 1% level, indicating that decreases in the SG&A ratio are associated with higher one-year-ahead changes in earnings during periods of decreasing SG&A ratio, increasing sales and decreasing SG&A costs. This finding is important, given that untabulated tests of periods split solely into increasing and decreasing sales find no association between changes in the SG&A ratio and future earnings during periods of increasing sales. My results indicate that although periods of increasing sales alone do not provide statistically significant information about future earnings, the further partitioning of increasing sales periods into those with increasing and decreasing SG&A costs does provide new information. While it is not surprising that periods of increasing sales and decreasing SG&A costs signal better future performance, this has not been documented in prior research. The coefficient on *SS_3* is not statistically significant, indicating that changes in the SG&A ratio during periods where the SG&A ratio, sales and SG&A costs are all decreasing are not associated with one-year-ahead earnings change. The results of these three periods suggest that the presumption in fundamental analysis that decreases in the SG&A ratio represent "increasing efficiency," and therefore signal better future performance, is not always correct. The coefficient on *SS_4* is negative and significant at the 5% level, indicating that increases in the SG&A ratio are associated with lower one-year-ahead changes in earnings during periods where the SG&A ratio, sales and SG&A costs are all increasing, which is the prediction based on fundamental analysis. The coefficient on *SS_5* is statistically insignificant, indicating that changes in the SG&A ratio during periods of increasing SG&A ratio, decreasing sales and increasing SG&A costs are not associated with one-year-ahead earnings change. Finally, the coefficient on *SS_6* is positive and significant at 1% level, indicating that increases in the SG&A ratio are associated with higher one-year-ahead changes in earnings during periods of increasing SG&A ratio, decreasing sales and decreasing SG&A costs. While the results of untabulated tests of periods of decreasing sales alone were consistent with the findings of Anderson et al. (2007), this full partitioning into Subsamples 5 and 6 suggests that the results are being driven by periods of decreasing sales that also exhibit increasing SG&A ratio and decreasing SG&A costs. Or, in other words, periods where both sales and SG&A costs are decreasing, but sales are decreasing more, which is reasonably explained by the concept of cost stickiness. On the other hand, if sales are decreasing while SG&A costs are increasing or if SG&A costs are decreasing more than sales, there is no statistical expectation of better future performance.

4.2. The relation between changes in the SG&A ratio and analyst forecast revisions

In this section, I examine whether changes in the SG&A ratio are associated with analyst forecast revisions in the same way they are related to changes in future earnings. If analysts understand and incorporate the information provided by the change in the SG&A ratio into their forecast revisions, then this symmetry will exist. Table 4 presents results

Table 4
Regressions of forecast revisions on subsamples 1 through 6.

	EQ(2)
DV = *FR*	
Intercept	0.0917***
	(<.0001)
SS_1	0.0081
	(0.9160)
SS_2	0.3086***
	(0.0008)
SS_3	0.6366***
	(0.0089)
SS_4	0.0325
	(0.5308)
SS_5	0.0322***
	(0.0005)
SS_6	0.0697*
	(0.0770)
CEPS	0.2415***
	(<.0001)
ΔINV	−0.0772
	(0.5844)
ΔAR	0.0260
	(0.8134)
ΔCAPX	−0.0003**
	(0.0114)
ΔGM	−0.1527
	(0.0943)
ETR	−0.0440
	(0.2184)
LF	0.0065
	(0.8060)
ΔLEV	0.0026
	(0.3859)
Growth	0.0059
	(0.4526)
N	11,030
Adj R^2	2.954%

***, **, * denotes statistical significance at <.01, <.05, and <.10 levels, respectively, for two-tailed tests. *P*-values provided in parentheses.

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from the regression relating changes in the SG&A ratio to one-year-ahead analyst forecast revisions. Eq. (2) examines the relation between changes in the SG&A ratio and analyst forecast revisions during periods with different combinations of changes in the SG&A ratio, sales and SG&A costs, as represented by my six subsamples. The coefficients on *SS_2* and *SS_6* are consistent with the results from the tests on one-year-ahead earnings changes, suggesting that analysts correctly interpret the signals and impound the information into their forecast revisions for these two subsamples. This is not surprising for *SS_2*, where the results from the one-year-ahead earnings changes are predicted by fundamental analysis. However, the results for *SS_6*, suggest that analysts are able to see past the incorrect prediction of fundamental analysis (i.e., worse future performance) and identify managers deliberately retaining resources in expectation of increases in future sales. The coefficients on *SS_1* and *SS_4* are statistically insignificant, which is inconsistent with the coefficients from the test on change in earnings, suggesting that analysts do not understand that the signals in these subsamples are providing information, and they do not impound the information into their revisions. This is not surprising for *SS_1*, where the results from the one-year-ahead earnings changes are not consistent with the prediction of fundamental analysis. In the same way that managers may not be anticipating decreases in future sales that lead to worse performance, analysts seem similarly unaware. However, it is surprising for *SS_4*, where the results from the one-year-ahead earnings changes are consistent with the prediction of fundamental analysis. It is possible that analysts are not reacting to the signal sent from the increasing SG&A ratio because of the mixed signal being sent by increasing sales. Finally, the coefficients on *SS_3* and *SS_5* are positive and significant at the 1% level, despite the fact that tests on change in earnings for these two subsamples indicate no association. This suggests that analysts incorrectly believe the signals are providing information, when they are not, and make forecast revisions based on this faulty belief.

4.3. The relation between changes in the SG&A ratio and stock returns

In this section, I examine whether changes in the SG&A ratio are associated with 12-month buy-and-hold abnormal returns. Table 5 presents results from the regression relating changes in the SG&A ratio to buy-and-hold returns. I run each regression twice, first with my variables of interest and the other fundamental signals, and then again with my variables of interest, the other fundamental signals, and analyst forecast revisions. The first specification examines whether the information provided by changes in the SG&A ratio are priced in the market, and the second specification determines the extent to which information provided by the change in the SG&A ratio that is priced in the market is contained in analyst forecast revisions. Eqs. (3) and (4) examine the relation between changes in the SG&A ratio and abnormal returns during periods with different combinations of changes in the SG&A ratio, sales and SG&A costs, as represented by my six subsamples.

The coefficients on *SS_1* and *SS_4* are negative and significant for both Eqs. (3) and (4), indicating a negative relation between changes in the SG&A ratio and abnormal stock returns in these two different information environments, which is consistent with the results from the test on change in earnings. In both of these cases the market is correctly identifying the signal of worse future performance. The coefficients on *SS_3* and *SS_6* are positive and significant for both Eqs. (3) and (4), indicating a positive relation between changes in the SG&A ratio and abnormal stock returns in these two different information environments. For *SS_3*, this suggests that the market is assuming better future performance that does not take place. However, for *SS_6*, the market is correctly identifying the signal of better future performance. The coefficient on *SS_2* is positive and significant for Eq. (3) but insignificant for Eq. (4), suggesting that the market is also correctly identifying better future performance but only because of the forecast revision signal. Finally, the coefficient on *SS_5* is statistically insignificant for Eq. (3) but negative and significant at the 5% level for Eq. (4), suggesting that relative increases in the SG&A ratio signal lower abnormal returns in periods with increases in the SG&A ratio, decreases in sales and increases in SG&A costs when controlling for forecast revisions.

Table 5
Regressions of buy and hold returns on subsamples 1 through 6.

	EQ(3)	EQ(4)
DV = *BHAR*		
Intercept	−0.0150*	−0.0332***
	(0.0605)	(<.0001)
SS_1	−0.4187***	−0.2627**
	(0.0010)	(0.0349)
SS_2	0.3164**	0.2170
	(0.0303)	(0.1451)
SS_3	1.3840***	1.3048***
	(<.0001)	(<.0001)
SS_4	−0.1503***	−0.1419***
	(0.0079)	(0.0093)
SS_5	−0.0205	−0.0338**
	(0.1733)	(0.0370)
SS_6	0.2144**	0.1376*
	(0.0150)	(0.0720)
CEPS	0.0850**	0.0337
	(0.0300)	(0.4127)
Δ*INV*	−0.6371***	−0.8545***
	(0.0019)	(<.0001)
Δ*AR*	−0.1045	−0.1476
	(0.5133)	(0.4128)
Δ*CAPX*	−0.0010***	−0.0008**
	(0.0032)	(0.0173)
Δ*GM*	−0.1883	−0.1955
	(0.1282)	−0.1402
ETR	0.0065	0.0213
	(0.8260)	(0.4358)
LF	0.0757*	0.1487***
	(0.0526)	(0.0003)
Δ*LEV*	0.0065*	0.0041
	(0.0582)	(0.2406)
Growth	0.0523	0.0640
	(0.2044)	(0.1846)
FR		0.1623***
		(<.0001)
N	11,929	10,565
Adj R^2	1.659%	2.478%

***, **, * denotes statistical significance at <.01, <.05, and <.10 levels, respectively, for two-tailed tests. *P*-values provided in parentheses.

5. Conclusion

Fundamental analysis suggests that increases in the SG&A ratio represent decreases in efficiency and are indications that managers are not able to adequately control costs. Furthermore, this lack of control is a negative signal regarding future performance and firm value. Alternatively, decreases in the SG&A ratio are viewed as increases in efficiency and are a sign that managers are properly controlling costs. Therefore, this decrease is believed to be a positive signal regarding future performance and firm value.

In early empirical research, Abarbanell and Bushee (1997) examined the relation between changes in the SG&A ratio and one-year-ahead earnings change and found a statistically insignificant association. Anderson et al. (2007) draw on the earlier work in Anderson et al. (2003) that demonstrates SG&A costs do not decrease as much when revenue decreases as they increase when revenue increases and hypothesize that this could be the reason Abarbanell and Bushee (1997)

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did not find results. They test this theory and find that increases in the SG&A ratio signal higher future earnings during times of increasing sales and lower future earnings during times of decreasing sales. The partitioning of the full sample into periods of increasing and decreasing sales creates a new set of signals from the change in the SG&A ratio that is incrementally informative about future earnings change. Additionally, the results raise the possibility that increases in the SG&A ratio do not always represent loss of control over costs and a decline in efficiency, and likewise, a decrease in the SG&A ratio does not necessarily indicate better future performance. This suggests that a further partitioning of the full sample into changes in the SG&A ratio and both of its components may also provide additional information about future performance and firm value because of the intentional responses of managers to changes in sales. In this study, I identify subsamples of firm-years representing all possible combinations of changes in the SG&A ratio and its components, and I examine whether changes in the SG&A ratio provide information about future earnings, analyst forecast revisions, and future stock returns in different circumstances.

I find that the expectations of fundamental analysis, as they relate to changes in the SG&A ratio, do not always hold true. In fact, when I examine three different combinations of observations with decreases in the SG&A ratio, only one signals better future performance. Additionally, one of the sets of observations with increases in the SG&A ratio signal better future performance, which is also opposite the prediction of fundamental analysis. However, this does support the results of Anderson et al. (2007) who find that increases in the SG&A ratio signal better future performance in periods of decreasing sales, but also provides incremental informativeness by demonstrating that this only holds in periods when the SG&A ratio is increasing, sales are decreasing, and SG&A costs are decreasing. Additionally, I find that analysts understand the signal contained in changes in the SG&A ratio and incorporate the information into their forecast revisions for only two of my six subsamples. In the other four subsamples, they either incorrectly interpret the signal and do not incorporate it into their revisions, or they create revisions as though the signal contained information, when it does not. Finally, I find that in five of my six subsamples, the change in the SG&A ratio is statistically related to future abnormal returns, even when controlling for the information contained in forecast revisions. This suggests that investors understand that analysts do not fully incorporate the information from the signals into their revisions and respond accordingly.

Appendix A

Variable definitions

Dependent variables	
One-year-ahead earnings change ($CEPS1_{i,t}$)	[Adjusted earnings per share$_{i,t+1}$ − adjusted earnings per share$_{i,t}$]/adjusted ending stock price$_{t-1}$
One-year-ahead analyst forecast revision ($FR_{i,t}$)	[(Consensus analyst forecast for $t+1$ issued in $t+1$ − adjusted earnings per share$_{i,t}$) − (consensus analyst forecast for $t+1$ issued in t − consensus analyst forecast for t issued in t)]/adjusted ending stock price$_{t-1}$
Buy-and-hold abnormal returns ($BHAR_{i,t}$)	Size adjusted, buy-and-hold abnormal return of firm i cumulated from the end of the third month after the fiscal year-end of year t through 12 subsequent months
Fundamental signals	
Current year earnings change ($CEPS_{i,t}$)	[Adjusted earnings per share$_{i,t}$ − adjusted earnings per share$_{i,t-1}$]/adjusted ending stock price$_{t-1}$
Change in inventory ($\Delta INV_{i,t}$)	(Inventory$_{i,t}$/sales$_{i,t}$) − (inventory$_{i,t-1}$/sales$_{i,t-1}$)
Change in accounts receivable ($\Delta AR_{i,t}$)	(Accounts receivable$_{i,t}$/sales$_{i,t}$) − (accounts receivable$_{i,t-1}$/sales$_{i,t-1}$)
Change in capital expenditures ($\Delta CAPX_{i,t}$)	(Firm capital expenditures$_{i,t}$/industry capital expenditures$_{i,t}$) − (firm capital expenditures$_{i,t-1}$/industry capital expenditures$_{i,t-1}$)
Change in gross margin ($\Delta GM_{i,t}$)	(Gross margin$_{i,t}$/sales$_{i,t}$) − (gross margin$_{i,t-1}$/sales$_{i,t-1}$)
Effective tax rate ($ETR_{i,t}$)	[(Average tax rate from $t-3$ to $t-1$ − tax rate in t) * $CEPS_{i,t}$]
Labor force ($LF_{i,t}$)	[(Sales$_{i,t-1}$/# of employees$_{i,t-1}$) − (sales$_{i,t}$/# of employees$_{i,t}$)]/(sales$_{i,t-1}$/# of employees$_{i,t-1}$)
Change in leverage ($\Delta LEV_{i,t}$)	(Long-term debt$_{i,t}$/equity$_{i,t}$) − (long-term debt$_{i,t-1}$/equity$_{i,t-1}$)
Sales growth ($Growth_{i,t}$)	(Sales$_{i,t}$/sales$_{i,t-1}$) − (sales$_{i,t-1}$/sales$_{i,t-2}$)
Variables of interest	
Subsample 1 ($SS\_1_{i,t}$)	Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales increase, and SG&A costs increase, and 0 otherwise
Subsample 2 ($SS\_2_{i,t}$)	Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales increase, and SG&A costs decrease, and 0 otherwise
Subsample 3 ($SS\_3_{i,t}$)	Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales decrease, and SG&A costs decrease, and 0 otherwise
Subsample 4 ($SS\_4_{i,t}$)	Change in SG&A ratio when SG&A ratio increases, sales increase, and SG&A costs increase, and 0 otherwise
Subsample 5 ($SS\_5_{i,t}$)	Change in SG&A ratio when SG&A ratio increases, sales decrease, and SG&A costs increase, and 0 otherwise
Subsample 6 ($SS\_6_{i,t}$)	Change in SG&A ratio when SG&A ratio increases, sales decrease, and SG&A costs decrease, and 0 otherwise

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