Gross Profit Surprises and Future Stock Returns

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Abstract

We show that seasonally-differenced gross profit surprises predict future stock returns incremental to returns predicted by standardized unexpected earnings (i.e., SUE) and other accounting-based variables with predictive power. Hedge portfolio strategies that exploit the predictive capacity of gross profit surprises generate significant positive returns in most calendar quarters spanning 1977-2010 with magnitudes comparable to SUE-based strategies. We also show that the incremental predictive capacity of revenue surprises documented in Livnat and Jegadeesh (2006) is subsumed by gross profit (i.e., revenues less cost of sales) surprises when returns are measured over three months beginning in the fiscal quarter subsequent to the surprise quarter.

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I. Introduction

In this paper, we evaluate the predictive power of quarterly gross profit surprises (defined as scaled seasonal changes in the level of gross profit) for future stock returns.[1] Practitioners in recent years have devoted increasing attention to gross profit as a signal of future profitability, particularly for firms whose expansion activities temporarily depress earnings.[2] Given the potential for gross profit surprises to provide information about future profitability that may not be fully captured by bottom-line earnings surprises, we are naturally interested in testing whether investors incorporate such information into stock prices in a complete and timely manner.

Over a sample period spanning fiscal years 1977-2010, we first document that hedge portfolios formed on quarterly gross profit surprises (hereafter SUGP) at the beginning of the fourth month after quarter-end earn three-month returns that are comparable to hedge returns formed on analogously-defined earnings surprises (hereafter SUE). The profitability of SUGP hedge strategies remains strong after risk adjustment using the Carhart (1997) four-factor model. In addition, SUGP hedge strategies are profitable for roughly the same number of calendar quarters as SUE hedge strategies and over the last ten years of our sample period, returns to SUGP hedge strategies, on average, are more than double the returns to SUE hedge strategies (2.72% vs. 1.27%). While investors in recent years appear to have increased their efficiency with respect to impounding earnings surprise information into stock prices (Richardson et al. 2010), our

[1] We use the "surprises" terminology for expositional ease and do not intend to suggest seasonal differences in quarterly gross profit are always surprises to the market.
[2] For example, an analyst remarked after upgrading his stock recommendation for Amazon, "beginning to see clouds part in the (Amazon) investment case as we believe we and the Street are under-appreciating the growing and expansive drivers within (Amazon's) gross margin" (Ray 2012).

results suggest investors remain relatively less efficient with respect to pricing information conveyed by gross profit surprises.

Since gross profit is often a major component of earnings, we next consider whether the profitability of the SUGP hedge strategy over our sample period is simply a manifestation of post earnings announcement drift (Joy et al. 1977; Foster et al. 1984; Bernard and Thomas 1990; Ball and Bartov 1996) as captured by a SUE hedge strategy. We show through two-way sorts on SUGP and SUE quintile portfolios that SUGP's predictive power for returns is incremental to SUE's predictive power. Furthermore, Fama-MacBeth regression results reveal that both SUGP and SUE exhibit incremental explanatory power for future returns after controlling for other predictive accounting-based variables including accruals (Sloan 1996), levels of earnings (Balakrishnan et al. 2010), levels of gross profit (Novy-Marx 2013), cash flows (Lakonishok et al. 1994) and revenue surprises (Livnat and Jegadeesh 2006). Therefore, SUGP and SUE appear to exhibit distinct forms of mispricing by investors.

Interestingly, we find from our Fama-Macbeth regressions that SUGP largely subsumes the incremental return predictive power of revenue surprises (hereafter SUREV) documented in Livnat and Jegadeesh (2006). Since the predictive power of SUREV in Livnat and Jegadeesh (2006) was linked to its incremental ability to predict future earnings surprises (as captured by SUE), we test SUGP's incremental predictive power for future earnings surprises by regressing one-quarter ahead SUE on current quarter SUGP, SUE and SUREV. Our results show that both SUGP and SUE incrementally predict one-quarter-ahead SUE, while the coefficient on SUREV is no longer significantly positive. These findings suggest that the information contained in revenue surprises for future profitability is largely a manifestation of the information contained in gross profit (i.e., revenue minus cost of sales) surprises.

Our findings add to a long-standing accounting literature on the stock return predictability of publically available financial reporting information. Much of the early research in this area focused predominately on the predictive power of bottom-line earnings (Ball and Brown, 1968; Foster et al. 1984; Bernard and Thomas 1990). More recent work decomposes earnings into components and demonstrates that variation in time series properties of the components tracks variation in future returns (Sloan 1996; Livnat and Jegadeesh 2006; Novy-Marx 2013). In particular, these decompositions often exploit variation in the persistence of earnings components within future earnings streams to forecast signs and magnitudes of future returns. As gross profit purges earnings of non-recurring items (e.g., special items) and recurring items that may not persist at their current levels (e.g., advertising expense to increase product awareness), future returns stemming from earnings surprises are likely to capture a sizeable component related to information in gross profit surprises. Our results therefore refine our understanding of the nature of earnings mispricing and, in the process, provide investors with guidance for enhancing the profitability of trading strategies that exploit anomalous stock market behavior.

The remainder of the paper proceeds as follows. In section II, we describe our sample selection criteria and formally define the variables employed in our analysis. Section III reports the hedge return results of SUGP. Section IV provides regression results when SUGP and other predictive variables are considered jointly. Section V examines whether gross profit surprises can predict future earnings surprises incremental to current earnings (and revenue) surprises. Section VI concludes.

II. Sample Selection and Variables

We draw our base sample from the CRSP monthly returns database and the Compustat quarterly database for fiscal years spanning 1977 through 2010. We consider December year-end firms whose quarter-end stock prices and market capitalization exceed $1 per share and $5 million, respectively. Each firm-quarter observation requires non-missing Compustat data in quarter *t* and *t-4* to construct the variables employed in all our tests. Monthly returns associated with each firm-quarter observation begin in the fourth month subsequent to quarter-end (we will discuss our return accumulation procedures in more detail below). Our base sample consists of 269,967 firm-quarter observations covering 10,005 distinct firms. We also consider two subsamples. First, in a test where we examine whether gross profit surprises predict one-quarter-ahead earnings surprises, we impose an additional restriction requiring data availability for earnings before extraordinary items in quarter *t+1*, resulting in a subsample of 267,077 firm-quarters covering 9,914 distinct firms. Second, we run a Fama-MacBeth regression that includes accruals and cash flow variables computed using data from the statement of cash flows, which is only available for fiscal years ending in 1988 or later. Consequently, we employ a second subsample that consists of 186,664 firm-quarters covering 8,131 distinct firms.

Our primary variable of interest is *SUGP*, the quarterly gross profit surprise, computed as the difference between quarter *t* and quarter *t-4* gross profit (Compustat items SALEQ minus COGSQ) scaled by market value of equity (Compustat items CSHOQ x PRCCQ) at the end of the fiscal quarter (note that our independent variables, except percentages, will all be scaled by ending market value of equity).[3] Similarly, we also compute *SUE* as scaled seasonally-differenced earnings before extraordinary items (Compustat item IBQ) and *SUREV* as scaled seasonally-differenced revenue. All three variables are meant to capture "surprises" in their respective income statement items and consideration of *SUE* and *SUREV* is motivated by evidence in prior literature that shows both variables predict future returns incremental to one another (Livnat and Jegadeesh, 2006). If *SUGP* has predictive power for future returns, we would want to evaluate whether such predictive power is incremental to, subsumes, or is subsumed by either *SUE* or *SUREV* given the mechanical relations between all three variables.

Furthermore, we're also interested in evaluating *SUGP*'s predictive power in relation to other variables prior literature has shown to have predictive power for future returns. Novy-Marx (2013) finds the *level* of gross profit predicts future returns in an annual setting and further shows that many accounting anomalies are subsumed after controlling for gross profitability. We therefore control for the *level* of gross profit on a *quarterly* basis, defining *GP* as the scaled level of gross profit in quarter *t*. While not the focus of our study, we are nevertheless interested to see whether gross profit *level*'s predictive capacities (including its capacity to subsume existing anomalies) extend to the quarterly setting.

[3] This choice of scalar follows from Rangan and Sloan (1998), where ending market value of equity is used to deflate seasonally-differenced earnings (i.e., *SUE*). Our results continue to hold when we construct *SUGP* using alternative deflation/seasonal adjustment methodologies that mirror those used to construct *SUE* in prior studies (e.g., Bernard and Thomas, 1990; Thomas and Zhang, 2008).

In addition to *GP*, we also consider: (a) the level of earnings, *E*, defined as scaled income before extraordinary items (Balakrishnan et al. 2010); (b) the *percentage* growth in sales, *SalesGr*, defined as quarter *t* sales minus quarter *t-4* sales, divided by quarter *t-4* sales (Lakonishok et al. 1994); (c) operating cash flows, *OCF*, computed as scaled net cash flows from operating activities (Compustat item OANCF) and (d) accruals, *ACC*, computed as scaled income before extraordinary items minus net cash flow from operations (Sloan, 1996).

We conduct our portfolio analysis using two types of monthly returns: raw returns and returns adjusted for risk using the Carhart (1997) four-factor model. For each firm-quarter, we compute buy-and-hold returns (inclusive of dividends and other distributions) beginning in the fourth month subsequent to quarter-end and ending at the end of the sixth month (i.e., three month duration). When we wish to control for risk factors in our portfolio analysis, we estimate the following portfolio-specific (e.g., *SUGP* deciles) monthly returns model:

$$R_{it} - R_{ft} = a + b_{iM}\left(R_{Mt} - R_{ft}\right) + s_i SMB_t + h_i HML_t + m_i MOM_t + \varepsilon_{it} \qquad (1)$$

$R_{Mt} - R_{ft}$, *SMB* and *HML* are defined in Fama and French (1996) and *MOM* is the momentum factor defined in Carhart (1997). The four-factor data are from Kenneth French's website.[4] The intercept (*a*) is an estimate of the *monthly* return on a given portfolio after controlling for risk factors identified by the Carhart model.

When we run Fama-MacBeth regressions, we consider three-month buy-and-hold returns, RET_{t+1}, as our dependent variable. When we wish to control for risk factors in

[4] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

our regression analysis, we employ the following regressors: (a) *MV*, defined as the market value of equity at the end of the quarter; (b) *BM*, defined as book value of equity (Compustat item CEQQ) divided by market value of equity at the end of the quarter; and (c) *MOM*, defined as the buy-and-hold six month return leading up to two months after a firm's fiscal quarter end.

Table 1 provides descriptive statistics for the variables used in our analysis. Note that all variables except future returns are Winsorized at the 1st and 99th percentiles at each portfolio date.[5] In Panel A, the mean value of *SUGP* is 0.007 (which is statistically different from zero in an untabulated t-test), indicating that firms' gross profits are slightly increasing on average relative to the same quarter in the prior year. In contrast, *SUE* has a mean of -0.001, indicating that income components below gross profit are slightly decreasing on average relative to the same quarter of the prior year.

Panel B presents Pearson (above the main diagonal) and Spearman (below the main diagonal) correlations for our variables. *SUGP* is strongly positively correlated with *SUE* and *SUREV* using both Pearson (ρ = 0.50 and 0.59, respectively) and Spearman (ρ = 0.60 and 0.66, respectively) correlations. The strength of these correlations is not surprising given the mechanical relations between the income statement items underlying these variables. *SUGP* also exhibits strong correlations with other predictive variables, so it will be crucial to control for these variables in our regression analysis.

In Panel C, we investigate the effects of potential nonlinearity on the correlations between *SUGP* and our control variables. Specifically, we independently rank *SUGP* and our control variables into deciles each quarter and we examine the mean decile rank

[5] Fama-Macbeth regressions employ the *decile ranks* of these variables, re-scaled so that the range of ranks varies in ascending order from zero to one.

values of our control variables within each *SUGP* decile. We find that *SUGP* deciles are monotonically and positively related to *SUE*, *SUREV*, *SalesGr*, *E*, and *MOM* deciles, whereas our remaining variables (*GP*, *BM*, *MV*, *ACC*, *OCF*) do not relate monotonically to *SUGP*. While Novy-Marx (2013) shows *levels* of gross profit positively predict future returns in an annual setting, the roughly U-shaped relation between *SUGP* and *GP* deciles in column 2 of Panel C suggests any return predictability exhibited by *SUGP* is not likely to completely reflect return predictability exhibited by *GP*.

III. Portfolio Returns Analysis

One-Way Sorts

Table 2 reports time-series means of future stock returns for sets of decile portfolios formed on *SUGP* and other variables (described in more detail below). In each column, firms are grouped in ascending order into one of ten portfolios based on the quarter-end realization of a particular variable (e.g., *SUE*). Buy-and-hold returns for each stock are calculated over months 4-6 relative to the quarter-end date and an equal-weighted mean return is computed for each portfolio across all quarters in our sample. We then form a zero-investment hedge portfolio for each variable by going long (short) in the highest (lowest) decile portfolio and we compute Fama and MacBeth t-statistics based on the time-series distribution of the mean hedge portfolio returns.

Panel A presents mean portfolio performance using raw returns. In column one, we see that the average three-month return for *SUGP* portfolios is monotonically increasing from 2.0% in D1 (the lowest decile, containing the smallest values of *SUGP*) to 5.5% in D10 (the highest decile, containing the largest values of *SUGP*). The average return to a hedge strategy on *SUGP* is 3.5% (D10-D1= 5.5%-2.0%, roughly 14% on an annualized basis) with a t-statistic of 9.18. In column two, we examine the performance of *SUE*-based portfolios. Average returns are roughly monotonically increasing from 1.8% in D1 to 5.2% in D10, amounting to an average hedge return of 3.4% (t = 7.68). These results are very similar to the *SUGP* results in column one.

To further illustrate the similarities of the hedge strategies for *SUGP* and *SUE*, Figure 1 plots returns for the *SUGP* (Panel A) and *SUE* (Panel B) hedge portfolios in each of the 136 quarters of our sample. From Panel A, we see that the *SUGP* hedge strategy is profitable in 113 out of 136 quarters (83% of quarters); by comparison, Panel B reveals that the *SUE* hedge strategy is profitable in 116 out of 136 quarters (85% of quarters). Interestingly, Panel C shows that while the *SUE* hedge strategy generated somewhat higher hedge returns on average in the early part of our sample, from 2001 to 2010, *SUGP* hedge strategies generated average 3-month returns of 2.72%, while the *SUE* hedge strategy produced average 3-month returns of only 1.27%. As such, while the last ten years have seen a dampening of post-earnings announcement drift, there still appears to be attractive gains to hedge strategies formed on gross profit surprises.

Given the similarities of the *SUGP* and *SUE* hedge strategies over our sample period, we next consider whether the information in gross profit surprises for future returns is distinct from the information contained in earnings surprises. To this end, we follow an approach employed in Thomas and Zhang (2011) and compute *residual* measures of *SUGP* and *SUE* using the residuals from the following cross sectional regressions estimated each quarter:

$$SUGP_i = \alpha_0 + \alpha_1 SUE_i + \varepsilon_i \quad (2)$$

$$SUE_i = \beta_0 + \beta_1 SUGP_i + \varepsilon_i \quad (3)$$

For each firm-quarter, we compute *ResSUGP* from (2) and *ResSUE* from (3) as the realized surprise minus the "fitted surprise" using the parameters (estimated quarterly) from each model. *ResSUGP* can be interpreted as an estimate of the surprise content in gross profit unrelated to the surprise content in earnings (and vice-versa for *ResSUE*). We are interested in whether quarterly decile sorts on *ResSUGP* and *ResSUE* exhibit return patterns similar to those exhibited by *SUGP* and *SUE* in the first two columns of Table 2, Panel A. Finding that significant hedge returns are earned on portfolios formed using *ResSUGP*, for example, would suggest gross profit surprises contain incremental information (relative to earnings) for future returns.

In column 3 of Table 2, Panel A, we see that mean returns to *ResSUGP* deciles are monotonically increasing from a low of 2.5% in D1 to a high of 4.7% in D10, and hedge returns are significantly positive at 2.2% (t = 5.39). In column 4, mean returns across *ResSUE* decile portfolios are roughly monotonic, with a significant hedge return of 1.7% (t = 4.10). Based on this analysis, it appears both forms of surprise have distinct information for future returns. As a crude approximation of gross profit's incremental surprise content, we can see that of the total information in *SUGP* for future returns, only about 37% is common to *SUE* (computed from mean *SUGP* and *ResSUGP* hedge returns as 3.5% - 2.2%/3.5% = 37%). As such, the similarity of the results in columns 1 and 2 for *SUGP* and *SUE* are not driven by information redundancy in both surprise variables. We will further examine the comparative information qualities of *SUGP* and *SUE* in later tests.

Moving over to column 5 of Table 2, Panel A, we repeat our analysis using revenue surprises (*SUREV*) as in Livnat and Jegadeesh (2006). Again, we see a roughly monotonic increase in mean returns moving from D1 (2.7%) to D10 (4.6%), with a resulting significant mean hedge return of 1.9% (t = 5.29). Compared to the mean hedge returns observed for *SUGP* (3.5%) and *ResSUGP* (2.1%), the hedge returns to revenue surprise strategies appear to be relatively weak. In our Fama-MacBeth analysis later in the paper, we'll more formally examine the relative predictive power of revenue and gross profit surprises for future returns.

In Panel B of Table 2, we repeat our hedge portfolio analysis using risk-adjusted returns based on the Carhart (1997) four-factor model (see equation 1 earlier). We report the estimated alphas for each decile portfolio and interpret these values as the portfolio's estimated *monthly* abnormal returns. In the first column, we see a roughly monotonic increase in alphas for *SUGP* portfolios (ranging from -0.57 in D1 to 0.38 in D10) with a mean monthly hedge return of 0.95% (t = 8.49). This compares to mean monthly hedge returns of 0.86% (t = 7.27) for *SUE* in column 2, 0.61% (t = 5.55) for *ResSUGP* in column 3, 0.37% (t = 3.49) for *ResSUE* in column 4, and 0.50% (t = 4.60) for *SUREV* in column 5. These results suggest our conclusions from Panel A are not likely to be driven by risk factors identified in the Carhart (1997) four-factor model.

Two-Way Independent Sorts

In Table 3, we further investigate the comparative return predictive capacities of *SUGP*, *SUE* and *SUREV* using portfolios formed based on two-way sorts. Specifically, we independently sort firms into *SUGP*, *SUE* and *SUREV* quintiles each quarter and form two sets of 25 (5 quintile x 5 quintile) portfolios from the intersection of (a) *SUGP* and *SUE* quintiles in Panel A and (b) *SUREV* and *SUE* quintiles in Panel B. We again report the mean buy-and-hold three month return for each portfolio over our sample period and compute hedge returns by differencing the mean returns for the highest and lowest quintile of one variable while holding the quintile rank of the other variable constant. In both panels, we vertically sort on *SUE* (i.e., each row holds the *SUE* quintile rank constant); in Panel A, we horizontally sort on *SUGP* and in Panel B, we horizontally sort on *SUREV*. Our primary interest is to see whether *SUGP*'s predictive power for future returns remains after "controlling" for *SUE*.

In Panel A of Table 3, we generally see increasing mean returns as we increase the quintile rank of *SUGP* while holding the *SUE* quintile rank fixed. Reading down the 2^{nd} to last column, hedging on the highest and lowest *SUGP* quintiles while holding the *SUE* quintile fixed produces positive mean returns ranging from 0.7% within the lowest *SUE* quintile to 2.2% within the highest *SUE* quintile. All hedge returns except the return corresponding to the lowest *SUE* quintile are statistically significant at the 5% level using Fama-MacBeth t-statistics (reported in the last column). In comparison, reading across the 2^{nd} to last row, we see that hedging on *SUE* while holding *SUGP* quintiles fixed produces positive mean returns ranging from 1.8% to 3.3%, with all 5 hedge returns being statistically significant at the 5% level (as reported in the bottom row). Overall, the results in Panel A of Table 3 suggest that while *SUGP*'s performance does not dominate or subsume the performance of *SUE*, *SUGP*'s predictive power for future returns is generally incremental to the predictive power of *SUE*.

In Panel B of Table 3, we perform similar analysis using two-way sorts on *SUREV* and *SUE*. Reading down the 2nd to last column, hedging on the highest and lowest *SUREV* quintiles while holding the *SUE* quintile fixed produces positive mean returns ranging from 0.3% within the lowest *SUE* quintile to 2.0% within the highest *SUE* quintile. Note, however, that hedge returns are only significant for portfolios formed holding the highest two *SUE* quintiles fixed (see the t-statistics in the last column). Reading across the 2nd to last row, holding *SUREV* quintiles fixed and hedging on *SUE* continues to generate positive and significant mean returns as was seen in Panel A. Comparing the results in Panel B to those in Panel A, it appears that *SUGP* has somewhat stronger incremental return predictive power relative to *SUREV*. In the next section, we will more formally assess *SUGP*'s incremental return predictive capacities relative to *SUREV* and other variables that have been documented to have predictive power using multivariate regression analysis.

IV. Future Return Regression Analysis

To provide a more comprehensive assessment of *SUGP*'s predictive power for future returns in relation to other variables found to have incremental predictive power in prior research, we now turn to multivariate analysis using Fama and Macbeth (1973) regressions. We run several specifications that regress three-month buy-and-hold returns (compounded over months 4-6 subsequent to quarter-end) on *SUGP* and other predictive variables. In all specifications, we include controls for risk factors (size, market-to-book, and momentum) on the right hand side, and we decile rank all of our regressors within each quarter and rescale them so that they vary in ascending order from zero to one. This transformation facilitates an interpretation of the estimated parameters as hedge returns to portfolios formed on each respective variable (e.g., the parameter for *SUE* is the mean quarterly hedge return for going long (short) in the highest (lowest) *SUE* decile). We employ our base sample in the first eight specifications and we employ a subsample in our ninth specification that adds requirements for statement of cash flow variables (which are available beginning in 1988) so that we can control for accruals and cash flows derived from statement of cash flow figures.

Table 4 presents our Fama-MacBeth regression results for nine different specifications (grouped by columns). In column one, we begin by regressing future returns on *SUGP* and our risk controls (recall that all nine specifications include controls for risk). The coefficient estimate on *SUGP* is 1.656 (amounting to an annualized return of 1.656 x 4 = 6.62%) and is statistically significant (t = 7.69). In column 2, we add *SUE* to the regression and the results indicate that the coefficient on *SUGP* is 1.701 and remains significant (t = 5.40). The coefficient on *SUE* is 1.197, which is highly significant (t = 5.17). We interpret these results as evidence that both *SUGP* and *SUE* have incremental explanatory power for future returns after controlling for risk.

In columns 3 and 4 of Table 4, we evaluate the incremental predictive power of *SUREV* for future returns in relation to *SUGP* (column 3) and *SUE* (column 4). Column 3 reports the coefficient on *SUGP* is 1.683 and statistically significant (t = 8.97), while the coefficient on *SUREV* is statistically indistinguishable from zero. These results suggest revenue surprises do not have incremental explanatory power for future returns after controlling for gross profit (revenue minus cost of sales) surprises. Column 4 replaces *SUGP* with *SUE* and the results show that both *SUREV* and *SUE* have significant positive loadings for future returns, consistent with findings in Livnat and Jegadeesh (2006). Comparing the coefficients on *SUGP* (1.701 in column 2) and *SUREV* (0.198 in column 4) when *SUE* is included in the model (which loads at 1.197 in column 2 and 2.196 in column 4), it appears the incremental predictive power of *SUGP* is much stronger than it is for *SUREV*, consistent with our portfolio results presented in Table 3. Moreover, the incremental predictive power of *SUREV* documented in Livnat and Jedadeesh (2006) appears to be a manifestation of the predictive power of gross profit surprises. We also show in column 5 that the *percentage growth* in sales (*SalesGr*) does not predict future returns incremental to *SUGP*, which remains positive and highly significant when controlling for *SalesGr*.

Column 6 of Table 4 considers the level of gross profit, *GP*, in relation to *SUGP* and the results indicate that both levels and (seasonally-differenced) changes in gross profitability have incremental explanatory power for future returns. While Novy-Marx (2013) shows gross profit *levels* subsume many variables with anomalous relations to future returns in an annual setting, column 6 suggests that gross profit levels do not subsume the predictive capacity of gross profit changes in a quarterly setting. Similarly, column 7 shows that the *level* of earnings, *E*, loads positively and significantly (coefficient = 2.88, t-stat = 5.08) along with *SUGP* (coefficient = 1.107, t-stat = 4.57).

In columns 8 and 9, we simultaneously control for multiple future return predictors to see whether the predictive power of gross profit surprises is subsumed by a combination of these predictors. Column 8 shows that when we control for variables analyzed in columns 1-7, *SUGP* continues to load positively and significantly (coefficient = 0.900, t-stat = 4.72), while the positive loading on *SUE* becomes statistically insignificant (t-stat = 0.68). When we consider our subsample that requires availability of statement of cash flow data (column 9), we find, consistent with prior research, that accruals (operating cash flows) are significant negative (positive) predictors of future returns, while gross profit surprises remain significant positive predictors of future returns (coefficient = 1.341, t-stat = 2.06). We also see that, in contrast to column 8, *SUE* again loads positively and significantly (coefficient = 1.143, t-stat= 2.06). Finally, we note that in both columns 8 and 9, *SUREV* fails to load significantly. Overall, our Fama-MacBeth regressions show that gross profit surprises have incremental explanatory power for future returns over several predictive variables examined in prior literature and that the predictive capacity of revenue surprises diminishes when we control for gross profit surprises.

V. Future Earnings Surprise Regression Analysis

Livnat and Jegadeesh (2006) show that revenue surprises are positively associated with future returns after controlling for earnings surprises, both in the one-quarter-ahead earnings announcement window and, to a more limited extent, in the 6-month period subsequent to the earnings announcement for the surprise quarter.[6] Analysis showing the incremental predictive power of revenue surprises for future returns follows analysis that shows revenue surprises incrementally predict one-quarter-ahead earnings surprises (i.e., *SUE*). The authors suggest these results are consistent with the body of literature that documents investors' under-reaction to earnings news (e.g., Bernard and Thomas, 1990)

[6] More specifically, they find that revenue surprises of small firms (but not large firms) predict abnormal returns in the 6-month period subsequent to the announcement of earnings in the surprise quarter. Revenue surprises of both small and large firms predict abnormal returns in the earnings announcement window of the quarter following the surprise quarter.

and, in particular, consistent with the idea that earnings surprises derived from more persistent earnings components (e.g., revenues) will result in exacerbated mispricing. Given that our analysis shows that the incremental predictive power of revenue surprises for future returns diminishes when we control for gross profit (i.e., revenues minus cost of sales) surprises, we are interested in seeing whether gross profit surprises can incrementally predict one-quarter-ahead earnings surprises, relative to earnings and revenue surprises of the current quarter.

Ex ante, we believe it is reasonable to expect gross profit surprises to provide information incremental to both earnings and revenue surprises for future earnings. While Livnat and Jegadeesh (2006) suggest earnings surprises driven by revenue surprises in the same direction are more likely to persist than earnings surprises driven by reduction in expenses, we argue that because cost of sales expenses are most directly matched to revenues in the period in which sales are recognized, the persistence of cost of sales is likely to track the persistence of revenues closer than other expense components. Furthermore, the matching of cost of sales to revenues (as captured by gross profit) likely provides a more reliable signal about the sustainability of earnings growth relative to the signal provided by revenue in isolation since the matching process implicitly reveals the maximum potential "return" on sales to investors.[7] As such, we expect gross profit surprises to have a positive association with one-quarter-ahead earnings surprises after controlling for surprises in current quarter revenue and earnings.

[7] Of course, in practice firms incur routine operating expenses (e.g., SG&A expenses) that will cut into what we term to be "maximal returns" to investors. We are simply arguing here that generating sales necessarily entails some costs (i.e., reported cost of sales) that cut into a theoretical maximal amount accruing to investors. The extent to which realized returns approach maximal amounts will depend on factors such as a firm's operating efficiency or employee compensation practices.

To test our expectation, we present Fama-MacBeth regression results in Table 5 for full and nested forms of the following model, which we run (*without* rank-transforming our variables) using a subset of our base sample that has one-quarter-ahead earnings surprise information:

$$SUE_{i,t+1} = \beta_0 + \beta_1 SUGP_{i,t} + \beta_1 SUE_{i,t} + \beta_1 SUREV_{i,t} + \varepsilon_{i,t+1} \qquad (4)$$

In column 1 of Table 5, we examine *SUGP*'s association with next quarter's *SUE* incremental to current quarter *SUE*. The coefficient on *SUGP* is 0.127 and highly significant (t-stat = 10.73), while the corresponding coefficient on *SUE* is 0.291 and also highly significant (t-stat = 19.13). Therefore, gross profit surprises appear to help predict next quarter's earnings surprise. In column 2, we provide analysis similar to Livnat and Jegadeesh (2006) to see whether revenue surprises predict next quarter's earnings surprise incremental to the current quarter earnings surprise for our sample. Indeed, we find that the coefficient on *SUREV* is positively and significantly associated with next quarter's earnings surprise (coefficient = 0.016, t-stat = 5.41). Finally, we run the full specification of equation (4) and present results in column 3. The coefficient on *SUGP* is 0.146 and remains highly significant (t-stat = 11.04), while the coefficient on *SUREV* is now negative and significant (coefficient = -0.012, t-stat = -3.84). Taken together, these results suggest growth in earnings driven by expansion in gross profitability is likely to be more persistent than earnings growth driven by revenue growth alone or by reduction of expenses below cost of sales. When considered alongside our earlier analysis documenting the incremental capacity of gross profit surprises to predict future returns, these results suggest the sustainability of the components giving rise to the earnings surprise conveys information about the extent of mispricing at the time earnings news is released.

VI. Conclusion

We show that seasonally-differenced gross profit predicts future returns incremental to earnings surprises and other variables with predictive power for firm-quarters spanning 1977-2010. A hedge portfolio strategy that invests long in the largest decile and short in the smallest decile of *SUGP* (our proxy for gross profit "surprise") can generate mean abnormal returns comparable to those generated by a *SUE* (i.e., standardized unexpected earnings) hedge strategy over our sample period. Further, our portfolio tests show the returns to a *SUGP* hedge strategy are not redundant with respect to a *SUE* hedge strategy, implying that gross profit surprises convey information incremental to that of earnings surprises for future returns. Finally, our Fama-MacBeth regressions show that the predictive power of revenue surprises for future returns documented in Livnat and Jegadeesh (2006) is subsumed by gross profit surprises, which may reflect gross profit surprises' superior ability to map into one-quarter-ahead earnings surprises (as documented in Table 5).

Our results contribute to the accounting anomaly literature by showing that surprises in gross profit, a component of earnings generally known at the time of news release, contain information related to future earnings that investors do not immediately and fully impound into stock prices. While Livnat and Jegadeesh (2006) draw similar conclusions with respect to revenue surprises, our results suggest cost of sales expenses likely moderate the sustainability of top-line growth, providing a more-direct summary of the firm's value generating activity for investors than what is conveyed by revenue alone.

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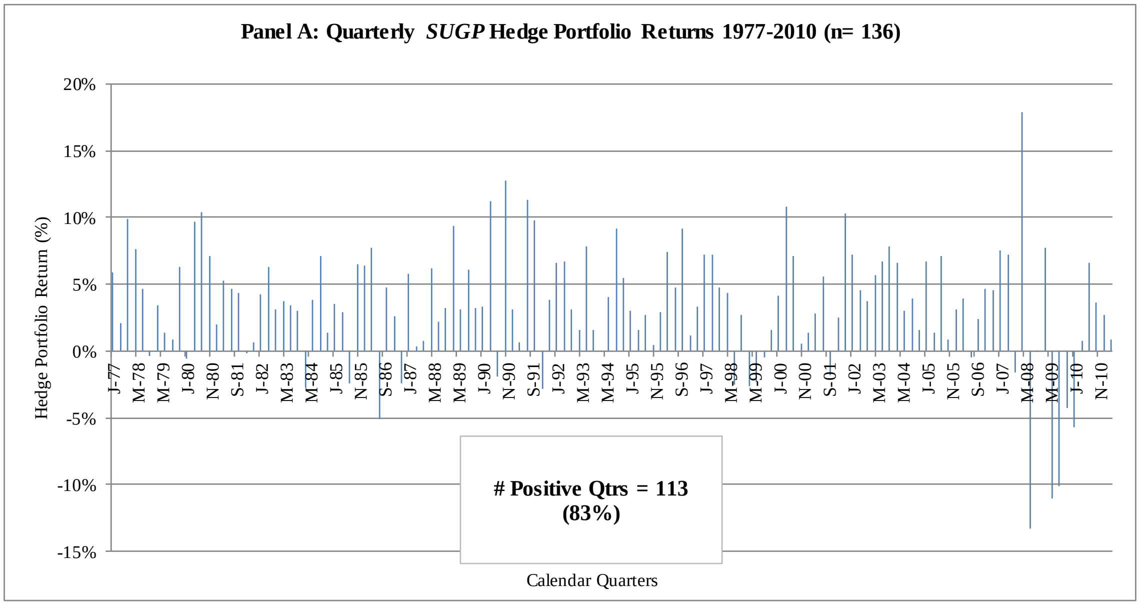
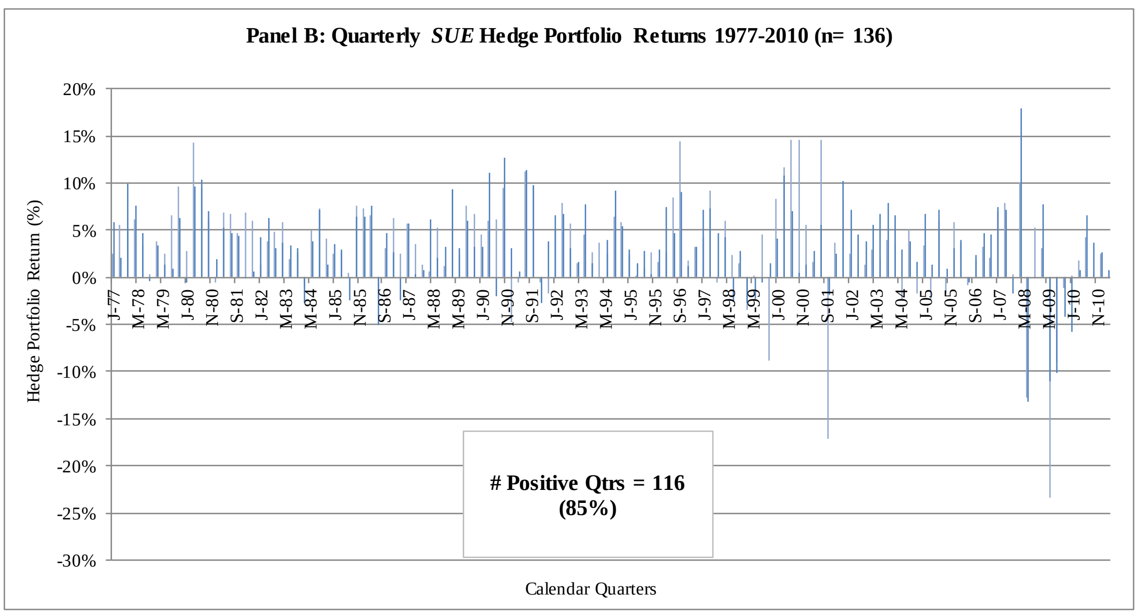
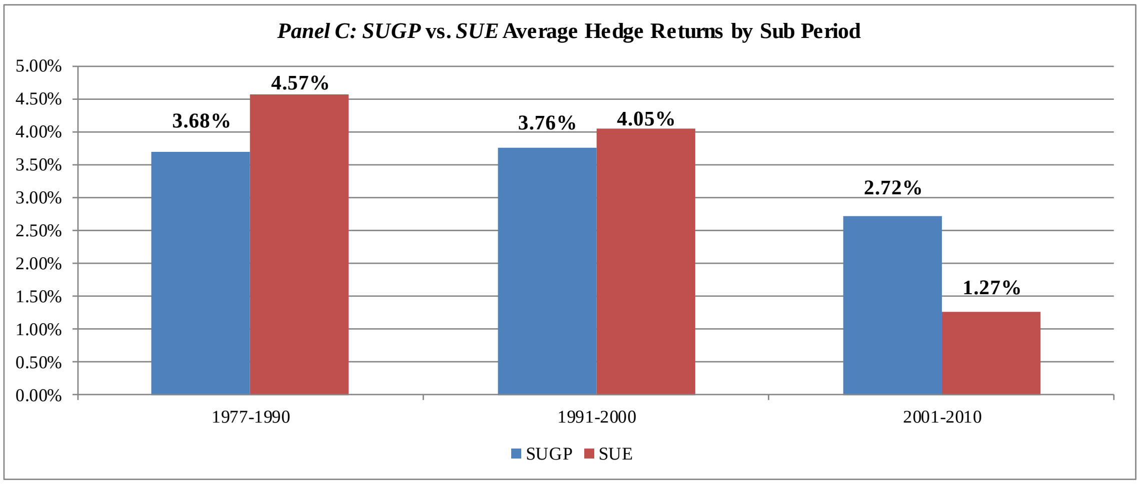
FIGURE 1





(Continued)

FIGURE 1 *Continued*



This figure reports quarterly hedge returns to *SUGP* and *SUE* strategies over our sample period spanning 1977-2010 (=136 quarters). In Panel A (Panel B), we report the hedge return in each calendar quarter to taking a long position in stocks in the highest decile and a short position in stocks of the lowest decile of *SUGP* (*SUE*) as reported at the end of each quarter. Hedge returns are compounded starting at the beginning of the fourth month and ending at the end of the sixth month subsequent to the quarter-end date. Panel C graphs the mean of the quarterly hedge returns to the *SUGP* and *SUE* strategies over three different subperiods: 1977-1990, 1991-2000, and 2001-2010. *SUGP* is quarter t gross profit minus quarter t-4 gross profit, scaled by market value of equity at quarter-end; *SUE* is quarter t earnings before extraordinary items minus quarter t-4 earnings before extraordinary items, scaled by market value of equity at quarter-end. See Table 1 for more detailed variable definitions.

TABLE 1

Descriptive Statistics

Panel A: Univariate Statistics

Variable[A,B]	N[C]	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
RET_{t+1}	269,967	0.033	0.240	-0.088	0.023	0.138
SUGP	269,967	0.007	0.039	-0.003	0.007	0.019
SUE	269,967	-0.001	0.039	-0.005	0.002	0.007
GP	269,967	0.107	0.103	0.046	0.079	0.135
SUREV	269,967	0.028	0.107	-0.001	0.015	0.047
SalesGr	269,967	0.171	0.422	-0.008	0.095	0.236
E	269,967	0.012	0.034	0.006	0.015	0.024
BM	269,967	0.638	0.434	0.338	0.555	0.837
MV	269,967	2,063.070	6,912.410	86.751	307.743	1,158.040
MOM	269,967	0.091	0.358	-0.105	0.054	0.230
ACC	186,664	-0.032	0.079	-0.070	-0.024	0.001
OCF	186,667	0.052	0.112	0.005	0.038	0.089

Panel B: Correlation matrix (Pearson correlations are shown above the main diagonal and Spearman correlations are shown below)[D]

	RET_{t+1}	*SUGP*	*SUE*	*GP*	*SUREV*	*SalesGr*	*E*	*BM*	*MV*	*MOM*	*ACC*	*OCF*
RET_{t+1}		**0.04**	**0.01**	**0.06**	**0.02**	**-0.01**	**0.04**	**0.04**	**-0.02**	**0.02**	**-0.05**	**0.06**
SUGP	**0.05**		**0.50**	**0.28**	**0.59**	**0.37**	**0.38**	**-0.04**	**-0.02**	**0.12**	**0.04**	**0.02**
SUE	**0.05**	**0.60**		**0.07**	**0.20**	**0.13**	**0.57**	**-0.08**	**0.01**	**0.15**	**0.09**	**0.06**
GP	**0.08**	**0.31**	**0.14**		**0.26**	**-0.06**	**0.25**	**0.49**	**-0.11**	**0.01**	**-0.01**	**0.18**
SUREV	**0.03**	**0.66**	**0.37**	**0.26**		**0.43**	**0.24**	**0.04**	**-0.04**	**0.04**	**0.07**	**-0.02**
SalesGr	**0.00**	**0.61**	**0.36**	**-0.06**	**0.81**		**0.05**	**-0.18**	**-0.01**	**0.07**	**0.10**	**-0.09**
E	**0.10**	**0.35**	**0.47**	**0.43**	**0.29**	**0.12**		**0.12**	**0.01**	**0.13**	**0.04**	**0.16**
BM	**0.06**	**-0.01**	**-0.04**	**0.49**	**0.03**	**-0.23**	**0.28**		**-0.15**	**-0.09**	**0.04**	**0.18**
MV	**0.02**	**-0.06**	**0.01**	**-0.27**	**-0.07**	**0.03**	**-0.02**	**-0.33**		**-0.01**	**-0.07**	**0.02**
MOM	**0.02**	**0.16**	**0.22**	**0.02**	**0.08**	**0.09**	**0.25**	**-0.07**	**0.03**		**-0.01**	**0.08**
ACC	**-0.07**	**0.02**	**0.03**	**-0.03**	**0.04**	**0.05**	**-0.02**	**0.07**	**-0.16**	**-0.06**		**-0.60**
OCF	**0.08**	**0.05**	**0.09**	**0.24**	**0.03**	**-0.09**	**0.32**	**0.22**	**0.10**	**0.13**	**-0.76**	

(Continued)

TABLE 1 *Continued*

Panel C: Properties of deciles based on gross profit surprise (SUGP)

		Mean Decile Ranks for									
		SUE	*GP*	*SUREV*	*SalesGr*	*E*	*BM*	*MV*	*MOM*	*ACC*	*OCF*
SUGP Deciles	*SUGP*	1	2	3	4	5	6	7	8	9	10
D1	-6.21%	1.45	4.67	1.66	1.42	2.46	6.12	3.25	3.25	4.58	4.33
D2	-1.38%	2.38	4.18	2.35	2.13	3.54	5.03	4.17	3.81	4.73	4.29
D3	-0.36%	3.19	3.76	2.94	2.89	4.01	4.37	4.66	4.11	4.61	4.28
D4	0.15%	3.89	3.52	3.49	3.77	4.26	3.81	5.15	4.42	4.36	4.30
D5	0.52%	4.45	3.66	4.12	4.52	4.48	3.59	5.32	4.60	4.23	4.34
D6	0.87%	4.93	4.02	4.77	5.14	4.67	3.61	5.17	4.77	4.25	4.29
D7	1.29%	5.34	4.54	5.40	5.58	4.87	3.86	4.82	4.90	4.36	4.37
D8	1.91%	5.84	5.20	6.06	5.95	5.16	4.24	4.40	5.01	4.53	4.47
D9	3.00%	6.34	5.99	6.85	6.40	5.49	4.70	3.93	5.03	4.65	4.62
D10	7.35%	6.99	7.27	7.62	6.77	5.91	5.50	3.26	5.05	4.92	4.89

[A] Variable definitions (items in parentheses are Compustat quarterly data items unless otherwise indicated):

RET_{t+1} = Three-month buy-and-hold stock returns beginning in the fourth month after fiscal quarter end (from CRSP monthly files).

SUGP = Gross profit surprise, calculated as quarter t gross profit (SALEQ-COGSQ) minus quarter t-4 gross profit, divided by market value of equity (CSHOQ x PRCCQ) at the end of quarter t.

SUE = Standardized unexpected earnings, calculated as quarter t earnings before extraordinary items (IBQ) minus quarter t-4 earnings before extraordinary items, divided by market value of equity at the end of quarter t.

GP = Level of gross profit, calculated as quarter t gross profit, divided by market value of equity at the end of quarter t.

SUREV = Revenue surprise, calculated as quarter t revenue (SALEQ) minus quarter t-4 revenue, divided by market value of equity at the end of quarter t.

SalesGr = Percentage growth in sales, calculated as quarter t revenue minus quarter t-4 revenue, divided by quarter t-4 revenue.

E = Level of earnings, calculated as quarter t earnings before extraordinary items, divided by market value of equity at the end of quarter t.

BM = Book-to-market ratio, calculated as quarter t book value of equity (CEQQ), divided by market value of equity at the end of quarter t.

MV = Market value of equity at the end of quarter t.

MOM = Momentum, calculated as the buy-and-hold six-month stock return leading up to two months after a firm’s fiscal quarter end

ACC = Accruals, calculated as quarter t earnings before extraordinary items minus net cash flows from operating activities (OANCF), divided by market value of equity at the end of quarter t.

OCF = Operating cash flows, calculated as quarter t net cash flows from operating activities, divided by market value of equity at the end of quarter t.

[B] All variables (except returns) are Winsorized at the 1% and 99% level by calendar quarter.

[C] The reduction in observations for *ACC* and *OCF* is due to the unavailability of cash flow statement data prior to 1988.

[D] All correlations are significant at the 1% level.

TABLE 2

Future Returns for Different Surprise Deciles Based on Gross Profit, Earnings and Revenue

Panel A: Raw Returns

	Ten Portfolios Sorted by *SUGP*	Ten Portfolios Sorted by *SUE*	Ten Portfolios Sorted by *ResSUGP*	Ten Portfolios Sorted by *ResSUE*	Ten Portfolios Sorted by *SUREV*
	1	2	3	4	5
D1	0.020	0.018	0.025	0.028	0.027
D2	0.024	0.019	0.026	0.030	0.027
D3	0.026	0.023	0.028	0.029	0.029
D4	0.028	0.027	0.029	0.029	0.031
D5	0.030	0.033	0.032	0.031	0.034
D6	0.034	0.036	0.035	0.032	0.035
D7	0.037	0.042	0.036	0.035	0.037
D8	0.040	0.042	0.037	0.039	0.040
D9	0.046	0.044	0.044	0.041	0.040
D10	0.055	0.052	0.047	0.045	0.046
D10-D1	0.035	0.034	0.022	0.017	0.019
t-stat	(9.18)	(7.68)	(5.39)	(4.10)	(5.29)

Panel B: Carhart (1997) Four-Factor Model Returns

	Ten Portfolios Sorted by *SUGP*	Ten Portfolios Sorted by *SUE*	Ten Portfolios Sorted by *ResSUGP*	Ten Portfolios Sorted by *ResSUE*	Ten Portfolios Sorted by *SUREV*
	1	2	3	4	5
D1	-0.570	-0.540	-0.410	-0.240	-0.380
D2	-0.280	-0.440	-0.220	-0.160	-0.210
D3	-0.140	-0.270	-0.120	-0.120	-0.040
D4	-0.060	-0.060	-0.060	-0.080	0.060
D5	-0.020	0.070	0.050	0.010	0.130
D6	0.100	0.150	0.100	-0.010	0.130
D7	0.140	0.270	0.100	0.100	0.110
D8	0.110	0.210	0.070	0.150	0.170
D9	0.240	0.200	0.210	0.130	0.040
D10	0.380	0.320	0.200	0.130	0.120
D10-D1	0.950	0.860	0.610	0.370	0.500
t-stat	(8.49)	(7.27)	(5.55)	(3.49)	(4.60)

(Continued)

TABLE 2 *Continued…*

This table reports mean future three-month stock returns, beginning the fourth month after fiscal quarter end, across ten deciles based on gross profit surprise ($SUGP$), earnings surprise (SUE), residual gross profit surprise after controlling for earnings surprise ($ResSUGP$), residual earning surprise after controlling for gross profit surprise ($ResSUE$), and revenue surprise ($SUREV$). $ResSUGP$ is calculated as the residual from regressing $SUGP$ on SUE in each quarter. For the third column, we estimate these regressions across all firms when calculating $ResSUGP$. Each calendar quarter, we sort firms into ten deciles based on $SUGP$, SUE, $ResSUGP$, $ResSUE$, $SUREV$ and portfolio returns are average stock returns of firms in each decile. The sample period includes 136 quarters from 1977:I to 2010:IV. In Panel A, the portfolio returns are the average of quarterly mean returns over 136 quarters. Panel B reports the intercept of the four-factor model for monthly returns for each of the ten gross profit surprise (SUGP), earnings surprise (SUE), residual gross profit surprise (ResSUGP), residual earnings surprise (ResSUE), and revenue surprise (SUREV) deciles. The four factor model estimated is:

$$R_{it} - Rf_t = a + b_{iM}(RM_t - Rf_t) + s_i SMB_t + h_i HML_t + m_i MOM_t + \varepsilon_{it},$$

where $RM_t - Rf_t$, SMB, and HML are as defined in Fama and French (1996), and MOM is the momentum factor as defined in Carhart (1997). Portfolio returns are average stock returns of firms in each decile. The sample period includes 360 months from July 1977 to June 2011. Fama-Macbeth t-statistics in both panels are reported in parentheses.

TABLE 3

Buy-and-hold three month stock returns for portfolios formed on SUGP, SUE and SUREV

Panel A: Two-way independent sorts on SUGP and SUE

		***SUGP* quintile**					*High SUGP - Low SUGP*	
		1 (Low SUGP)	*2*	*3*	*4*	*5 (High SUGP)*		
	1 (Low SUE)	-0.016	-0.011	-0.016	-0.007	-0.009	**0.007**	*1.42*
	2	-0.009	-0.011	-0.007	-0.004	0.006	**0.015**	*3.41*
***SUE* quintile**	*3*	-0.001	0.000	-0.001	0.005	0.009	**0.010**	*2.04*
	4	0.001	0.006	0.007	0.008	0.018	**0.017**	*3.81*
	5 (High SUE)	0.002	0.003	0.006	0.007	0.024	**0.022**	*4.70*
High SUE - Low SUE		**0.018**	**0.014**	**0.022**	**0.014**	**0.033**		
	t-stat	*4.35*	*2.23*	*3.58*	*2.51*	*5.97*		

Panel B: Two-way independent sorts on SUREV and SUE

		SUREV quintile					*High SUREV - Low SUREV*	
		1 (Low SUREV)	*2*	*3*	*4*	*5 (High SUREV)*		
	1 (Low SUE)	-0.015	-0.021	-0.010	-0.012	-0.012	**0.003**	*0.75*
	2	-0.009	-0.010	-0.007	-0.004	-0.003	**0.006**	*1.27*
SUE quintile	*3*	0.003	-0.001	0.002	0.002	0.004	**0.001**	*0.28*
	4	0.003	0.006	0.009	0.009	0.012	**0.009**	*2.14*
	5 (High SUE)	0.003	0.007	0.010	0.013	0.023	**0.020**	*4.73*
High SUE - Low SUE		**0.018**	**0.028**	**0.020**	**0.025**	**0.035**		
	t-stat	*4.92*	*5.21*	*3.29*	*5.26*	*7.68*		

The table reports mean three month buy-and-hold returns to portfolios formed based on two way independent sorts of *SUGP* and *SUE* (Panel A) and *SUREV* and *SUE* (Panel B). Each quarter, firms are sorted into one of five sorting variable quintiles based on the rank of a particular sorting variable. We form 25 (5x5) portfolios using stocks belonging to the intersection of quintile portfolios of our sorting variables. Hedge portfolios are formed by taking long (short) positions in stocks sharing a quintile rank in one sorting variable that belong to the highest (lowest) quintile of the other sorting variable. We test the significance of our hedge returns using Fama-Macbeth t-statistics.

TABLE 4

Regressions of Future Returns on Gross Profit Surprise and Control Variables

	1	2	3	4	5	6	7	8	9
SUGP	1.656***	1.701***	1.683***		1.683***	1.206***	1.107***	0.900***	1.341**
	(7.69)	(5.40)	(8.97)		(7.78)	(5.52)	(4.57)	(4.72)	(2.06)
SUE		1.197***		2.196***				0.270	1.143**
		(5.17)		(7.12)				(0.68)	(2.06)
SUREV			-0.004	0.198***				0.027	-0.054
			(-0.03)	(2.71)				(0.36)	(-0.39)
SalesGr					-0.008			-0.063**	0.045
					(-0.33)			(-2.05)	(0.89)
GP						0.702***		0.576***	0.561***
						(4.68)		(4.02)	(2.82)
E							2.880***	2.520***	1.287*
							(5.08)	(3.77)	(1.74)
ACCR									-1.188***
									(-3.99)
OCF									0.243*
									(1.92)
MV	-0.007	-0.009	-0.007	-0.008	-0.007	-0.004	-0.007	-0.006	-0.007
	(-0.48)	(-0.57)	(-0.72)	(-0.47)	(-0.77)	(-0.14)	(-1.18)	(-1.08)	(-0.25)
BM	0.126**	0.124**	0.113**	0.117**	0.114**	0.063	0.081*	0.027	0.018
	(2.28)	(2.32)	(2.26)	(2.28)	(2.23)	(1.34)	(1.75)	(0.76)	(0.35)
MOM	0.171**	0.153*	0.144*	0.162**	0.143*	0.135	0.117	0.054	0.036
	(2.06)	(1.83)	(1.78)	(2.05)	(1.74)	(1.58)	(1.41)	(0.67)	(0.33)

This table reports regressions of three-month future stock returns, beginning in the fourth month subsequent to fiscal quarter-end (RET_{t+1}), on gross profit surprises (*SUGP*) and control variables. The values of each regressor are transformed into decile ranks that vary in ascending order from zero to one. *SUGP* is gross profit in quarter t minus gross profit in quarter t-4, scaled by ending market value of equity (all subsequent regressors are scaled by ending market value of equity pre-transformation unless otherwise noted). *SUE* is quarter t income before extraordinary items minus quarter t-4 income before extraordinary items; *SUREV* is quarter t revenue minus quarter t-4 revenue; *SalesGr* is quarter t revenue minus quarter t-4 revenue scaled by quarter t-4 revenue; *GP* is the level of gross profit; *E* is the level of earnings before extraordinary items; *ACCR* is accruals, computed as income before extraordinary items minus net cash flows from operating activities; *OCF* is net cash flows from operating activities; *MV* is ending market value of equity; *BM* is the book-to-market ratio; *MOM* is the 6-month return ending at the end of the 2nd month subsequent to quarter end. See Table 1 for more detailed variable definitions. The sample period includes 136 quarters from 1977:I to 2010:IV. The coefficient estimates are the average of quarterly estimates over 136 quarters; t-statistics in parentheses are Fama-MacBeth t-statistics.

TABLE 5

Regressions of Future Earnings Surprise on Surprises in Gross Profit, Earnings, and Revenue

	Dependent Variable: SUE_{t+1}		
	1	2	3
SUGP	0.127***		0.146***
	(10.73)		(11.04)
SUE	0.291***	0.359***	0.286***
	(19.13)	(20.49)	(19.10)
SUREV		0.016***	-0.012***
		(5.41)	(-3.84)

This table reports results of Fama and MacBeth (1973) regressions of one-quarter ahead standardized unexpected earnings (SUE_{t+1}) on surprises in gross profit (*SUGP*), earnings (*SUE*), and revenue (*SUREV*). All regressors are scaled by market value of equity at quarter-end. *SUGP* is quarter t gross profit minus quarter t-4 gross profit; *SUE* is quarter t earnings before extraordinary items minus quarter t-4 earnings before extraordinary items; *SUREV* is quarter t revenue minus quarter t-4 revenue. See Table 1 for more detailed variable definitions. The sample period includes 136 quarters from 1977:I to 2010:IV. The coefficient estimates are the average of quarterly estimates over 136 quarters; t-statistics in parentheses are Fama-MacBeth t-statistics.