The International Journal of Business and Finance Research
Vol. 11, No. 1, 2017, pp. 49-63
ISSN: 1931-0269 (print)
ISSN: 2157-0698 (online)

IBFR
www.theIBFR.com

THE INCREMENTAL INFORMATION CONTENT OF SALES IN EXPLAINING STOCK RETURNS: A CROSS-INDUSTRY STUDY

Taewoo Park, Georgia Gwinnett College

ABSTRACT

In this paper we examine the industry specific determinants of the information content of sales incremental to earnings in explaining stock returns. We find that across industries the information content of sales beyond earnings in explaining contemporaneous return is significantly associated with the timeliness of earnings and sales information to the market. We find evidence of income smoothing which can arise from firms' accounting and operating decisions. The increase in R^2 due to sales in explaining returns varies widely across industries and is with and due to adding sales in addition to earnings with mean 57% after controlling for the effects of the timeliness of sales and earnings.

JEL: M21, M40

KEYWORDS: Information Content, Stock Returns, Sales, Earnings

INTRODUCTION

Sales information is the most commonly used item next to earnings by both financial analysts and managers. Sales are the principal source of a firm's revenue and investors and managers pay a great deal of attention to how a firm's sales are generated and change over time. Changes in a firm's sales and their expectations would thus be closely related to its current and future earnings and equity price, and studies have shown that there is information content in sales and sales forecasts incremental to earnings and earnings forecasts. However, studies show that earnings is a much better summary measure than sales in explaining stock returns. The purpose of this paper is twofold. First, we reexamine if there is information content of sales incremental to earnings in explaining stock returns. Second, we investigate the factors that influence the information content of sales.

This paper is different from most other existing studies that have similar purposes in that we actively utilize cross-industry differences for both purposes of our study. We use the increase in R^2 due to adding sales in return regressions (after a monotonic transformation into a zero-one interval: see Section 2.1) as our measure of the incremental information content of sales for each industry. Using 80,698 firm-year observations from 44 industries used by Fama and French (1997), we find that the increase in R^2 due to adding sales and the earnings and sales interaction in return regressions is 30% for the full sample. Separate industry regressions show wide differences across industries and a distinctively greater increase in R^2: the mean increase in R^2 is 57% (the median is 38%) for 44 industries. This suggests that the incremental information content of sales gleaned from a return regression on a pooled sample provides insufficient information about the informational value of sales if there are significant differences across industries in how sales and earnings are related to each other and to stock returns. In a pooled regression, interesting differences across industries are averaged out and, as a result, the information content of sales seems underestimated.

Given that there is significant information content of sales incremental to earnings, we search for the factors that influence the information content of sales from cross-industry differences. The results of separate return regressions for industries on earnings, sales, and an earnings-sales interaction term show that the sales term and the earnings-sales interaction term are both significantly positively associated with returns for most industries. This implies that sales have a positive effect on returns after controlling for its effect through earnings, and this effect is greater for higher earnings. We then link the industry measure of the information content of sales to how differently sales affect future earnings in different industries. It is natural to examine future earnings because stock returns reflect the realization of current earnings and also changes in expectations of future earnings. We first investigate how current sales are associated with immediate future earnings by regressing year *t+1* earnings on year *t* earnings, sales and the interaction of the two for each industry. The choice of immediate future earnings is made from our conjecture that they would be an important part of all future earnings due to their proximity and relatively low uncertainty. We find that in most industries the interaction term is positively associated with *t+1* earnings but current sales are not significantly associated with *t+1* earnings.

A positive coefficient on the interaction term implies that the impact of sales on immediate future earnings is more positive if current earnings are higher. This result can arise through direct income smoothing by means of accounting decisions such as discretionary cost allocation. For example, in a year when sales are strong, a firm can allocate more cost to the year, which favorably affects the next year's earnings. The result can also be obtained through purely operational decisions. For example, a firm can choose to initiate a measure related to its production, marketing, or administration that results in a reduction in earnings in the year of adoption but increases in earnings from the next year. This type of smoothing may be prevalent and even necessary for the survival of a firm.

The results show that the factors that influence the information content of sales are the timeliness of sales and earnings. The timeliness of sales (earnings) is the fraction of the sales (earnings) information that is impounded into stock price during the year when sales (earnings) are recognized in the firm's books. Timeliness affects information content because, unless the sales information is new to the market, sales would not have information content regardless of other factors. By the same token, as the timeliness of earnings decreases, current returns reflect less of the information contained in current earnings, and there is more room for sales to convey new information to the market. Adding these two timeliness measures to the regression of the information content of sales, we find that the timeliness of earnings and sales is significantly associated with the information content of sales.

We find that the mean timeliness of sales is 70% and the mean timeliness of earnings is 83%. In other words, 30% of the sales information, but only 17% of earnings information, are released to the market before the beginning of the year when the sales and earnings are recognized. This asymmetric timeliness between sales and earnings would affect our measure of the information content of sales that uses the market as the benchmark, because current returns reflect a smaller fraction of the current sales information than the current earnings information. There are two contribution of this study. First, we have shown that there is significant information content of sale incremental to earnings, which is on average 57% increase in R^2 across industries. Second, we have also shown that the information content of sales is significantly associated with the *timeliness* of current sales and earnings information.

This timeliness is the most fundamental factor that affects stock returns, but has never been considered in the sales-earnings research. Most prior research documents that earnings change supported by the sales change has more information content in explaining stock returns (for example, Hopwood and McKeown, 1985, Ghosh, Gu and Jain, 2005, Etimur, Livnat and Martikainen, 2003), or sales is more informative than earnings in explaining returns in certain industries, such as internet industries (Davis, 2002). This paper is organized as follows: we explain our research design in Section 2, describe sample and its statistics in Section 3, present and interpret our empirical results in Section 4, and conclude in Section 5.

LITERATURE REVIEW

Since Ball and Brown (1968) and Beaver (1968), voluminous literature has studied the empirical association between accounting earnings and stock returns. The most popular approach is to relate stock returns to unexpected earnings. Studies on the earnings-return relationship have later been extended to the usefulness of the non-earnings information from financial statements. For example, Penman (1992) demonstrated that financial statements provide relevant information in addition to earning changes. Some components of earnings, such as sales and expenses, are found to be correlated to stock returns. Nissim and Penman (2001) also adopted several financial ratios and analyzes equity valuation. Most of prior research on information content of sales documents that earnings change supported by the sales change has more information content in explaining stock returns. Hopwood and McKeown (1985) examined the association between quarterly returns and firms' sales and expenses, and concluded that expenses but not sales have incremental information content. Swaminathan and Weinthrop (1991) examined the same issue in a short-window event study and provide evidence that sales do have incremental information content. Kim, Lim and Park (2009) examined how sales affect earnings and in turn the stock price using a model in which sales contribute to earnings by a fixed sales margin rate and the stock price responds more sensitively to sales-induced earnings than to non-sales-induced earnings. Fairfield and Yohn (2001) documented that disaggregating the change in return on assets into the change in asset turnover and the change in profit margin is useful in forecasting future.

Studies show that forecasts of sales are also informative. Rees and Sivaramakrishnan (2007) reported that errors of financial analysts' revenue forecasts significantly affect stock returns. They documented a significant increase in the market premium to meeting earnings forecasts when the revenue forecast is also met and the market penalty to missing earnings forecasts is significantly attenuated when the revenue forecast is met. Also, Trueman, Wong and Zhang (2000 and 2001) documented the insignificant association between bottom-line net income and firms' market prices on internet firms' stocks, but gross profits are positively and significantly associated with prices when the net income is decomposed into its components (also, Penman 2001). Davis (2002) examined the relation between revenue and market value of internet firms, for which sales information is presumably very important compared to non-internet firms. Ertimur, Livnat and Martikainen (2003) also provided evidence that revenue forecast errors bear a significant association with announcement period returns. They showed that earnings surprises emanating from revenue surprises are more influential than earnings surprises resulting from expense surprises. Curtis, Lundholm and McVay (2014) modeled the relation between the firm's current period disclosures and future sales and examine how well their model works in the retail industry. They analyzed the relation between current period sales data and a logical forecast of future sales.

Etimur and Livnat (2002) showed that market reactions are generally positive and statistically different from zero for growth companies only when both earnings and revenues increase. Ghosh, Gu and Jain (2005) showed evidence that earnings growth sustained through revenue increases is valued more than earnings growth through cost reduction. They documented that firms reporting sustained increases in both earnings and revenues have higher quality earnings and larger earnings response coefficients in comparison to firms reporting sustained increases in earnings alone. This paper adopts a cross-industry analysis, by following industry classification by Fama and French (1997). Many accounting studies also performed empirical analyses by industry. For example, Biddle and Seow (1991) tested the associations between accounting earnings and stock returns by examining relationships between earnings response coefficients and industry structure characteristics. Bhojraj, Lee and Oler (2003) demonstrated that the Global Industry Classification Standard classifications are significantly better at explaining stock return co-movements and cross-sectional variations.

DATA AND METHODOLOGY

Measuring the Incremental Information Content of Sales

In this paper we examine the extent to which sales are useful in addition to earnings in explaining stock returns, and investigate factors that differently influence the degree of the usefulness of sales across industries. It is thus critical to use a measure of the incremental information content of sales for industries that is comparable across industries and efficiently captures the informational usefulness of sales. We choose a measure similar to the percentage increase in the R^2 of the regression of returns due to the use of sales as a source of extra independent variables. That is, for each industry we first regress yearly stock returns (R_t) on contemporaneous earnings changes (ΔY_t) :

$$R_t = \alpha_o + \alpha_1 \Delta Y_t + \varepsilon \quad (1)$$

We denote the R^2 of this regression by R^2_Y. If sales change (ΔS_t) becomes available as another observable, it creates two additional independent variables:

$$R_t = \alpha_0 + \alpha_1 \Delta Y_t + \alpha_2 \Delta S_t + \alpha_3 \Delta Y_t \Delta S_t + \varepsilon \quad (2)$$

The interaction term in the above regression becomes useful if the association between returns and sales is influence by the magnitude of earnings. Denoting the R^2 of this regression by R^2_{YS}, our measure of the incremental information content of sales, denoted by I, is defined by:

$$I \equiv \frac{R^2_{IS} - R^2_I}{R^2_{IS}} \quad (3)$$

The measure I is similar to but different from the percentage incremental R^2 of sales: in equation (3) the increase in R^2 is divided by R^2_{YS} instead of R^2_Y. While I is a monotonic transformation of the percentage increase in R^2 by adding sales to return-earnings regression, the advantage of I is that it is a normalized between 0 and 1 and is thus statistically more stable (especially when R^2_Y is very small). This measure I can be interpreted as the percentage of information recovered due to using sales as a source of information, because the market already uses the sales information in addition to earnings in forming price. The quantitative measure of the informational usefulness of sales developed above (i.e., I) provides us a well-defined dependent variable of which we investigate relevant factors. In particular, given the number of industries (44), it allows us to use the regression method in searching for factors that influence the information content of sales.

The Incremental Impact of Sales on Future Earnings

We reason that the incremental information content of sales arises mainly because sales have impact on future earnings as well as current earnings. If current sales influence current earnings and also alter the expectations of future earnings, the coefficients on sales and the earnings-sales interaction term in equation (2) are likely to be non-zero and I positive. Since the expectations of future earnings are not observable, we use the realized immediate future earnings as an imperfect but valuable surrogate for the expectations of future earnings. First, for each industry we first regress year $t+1$ earnings changes on year t earnings changes:

$$\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \varepsilon \quad (4)$$

We denote the $R^2$of this regression by Q^2_Y. Similarly to the return regression, we then use additional independent variables containing year *t* sales changes:

$$\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \beta_2 \Delta S_t + \beta_3 \Delta Y_t \, \Delta S_t + \varepsilon \quad (5)$$

Denoting the R^2 of this regression by Q^2_{YS}, we define a measure of the incremental information content of sales in explaining immediate future earnings, denoted by *H*, as:

$$H \equiv \frac{Q^2_{YS} - Q^2_{Y}}{Q^2_{YS}} \quad (6)$$

In equations (4) to (6), *H* would be positive if the estimates of β_2 and/or β_3 (call them b_2 and b_3, respectively) are significantly different from zero. In particular, b_2 measures the degree to which current sales influence the next year's earnings independently of current earnings. Current sales influence future earnings in many ways. Firstly, several studies in the literature point out that sales are sticky (persistent) so that current sales are a good indicator of future sales which in turn would increase future earnings. Secondly, a current sales influence future earnings through firms' decisions such as changes in product plans, production and marketing strategies, and accounting decisions. For example, a significant increase in sales prompts a firm to adopt an aggressive production plan (e.g., purchasing a more efficient machine or moving to a different plant or to a foreign country) which reduces the earnings of the immediate future periods but promote sales further or reduce costs in the long-run.

The coefficient b_3 captures the impact of current sales on the next year's earnings that depends on the magnitude of current earnings. If b_3 is positive, it implies that current sales and the next year's earnings tend to be more positively (or less negatively) associated if current earnings are higher. Income smoothing can be an explanation for this result. Suppose income smoothing occurs and smoothing changes the variance but not the ordering. That is, if unsmoothed income is higher for firm *A* than firm *B*, then smoothed income is also higher for firm *A* than firm *B*, but the two incomes are closer to each other after smoothing. Under this assumption, smoothing will cause b_3 to be positive, because if unsmoothed income shows an increase, smoothed income will also show an increase of lesser degree. Lowering current period's earnings is likely to have a positive effect on the next year's income. A negative b_3, on the other hand, is consistent with anti-smoothing such as big-baths.

That is, if there is a tendency among firms to choose the timing of big-baths when sales are low, the low sales would be associated with the higher earnings in the next period that results in the bag-baths. This can also occur for reasons unrelated to income smoothing through accounting means. For example, if firms tend to adopt a change in operations to reduce earnings in the immediate future years as the firms have high current earnings (and thus more cash, perhaps), a negative b_3 will result. Several studies in the literature (e.g., Etimur, Livnat and Martikainen, 2003) suggest that sales may be subject to manipulation to a lesser degree because it is more difficult to manipulate sales than expenses and because the penalty when detected is stiffer for sales manipulation. If firms tend to smooth earnings and sales are relatively free from these manipulations, we expect that b_3 is positive for most industries.

Factors that Influence the Information Content of Sales

Given the two sets of regressions described by equations (1) to (6), we want to understand how the incremental information content of sales measured by *I* is determined by how sales are related to future (in this case, the next year's) earnings. For this purpose, we regress *I* on the regression coefficients obtained from regressions of equation (5) and, as extra independent variables, the timeliness measures of earnings and sales. That is:

$$I = \gamma_0 + \gamma_1 b_1 + \gamma_1 b_1 + \gamma_1 b_1 + \gamma_4 TLS + \gamma_5 TLY + \varepsilon \quad (7)$$

where *TLS* and *TLY* are measures of timeliness of sales and earnings, respectively. The timeliness of sales (or earnings) is measured as the R^2 of the regression of sales (or earnings) changes on contemporaneous returns divided by the R^2 of the regression of the same on two immediate past years' returns. These measures the information contained in sales (or earnings) that becomes known to the market in the current year relative to the information that is impounded into price over three recent years including the current year. The above regression is run across the sample industries, with the number of observations being the number of industries. Assuming that b_2 and b_3 are positive for most industries, we expect that c_2 and c_3 (the estimates of γ_2 and γ_3, respectively) are also positive, because the information content of sales incremental to earnings is derived from investors' ability to infer future earnings from sales, represented here by b_2 and b_3. We also expect c_4 to be positive because the information content of sales is limited to what the market does not know at the beginning of the year. To the extent that the market already knows the year's sales figure at the beginning of the year, the sales-related information is already impounded in the stock price at the beginning the year and does not affect stock return during the year. On the contrary, we expect c_5 to be negative, because the more current returns reflect current earnings information, there is less room for sales to be incrementally informative.

Sample and Descriptive Statistics

We use firms with annual accounting and stock return information available since 1980. From the Compustat industrial and research database, we select all firms with major income statement data including sales revenue and income before extraordinary items. We include the Compustat research database to minimize any survivorship bias in our empirical tests. Also, annual stock return should be available from the CRSP database. Our data go back to 1980, but actual return tests are performed from 1983, for we use the lagged regression model to estimate industry-specific relationship between accounting variables and contemporaneous or lagged return. To avoid undue influence of extreme observations, we eliminate observations with the smallest and the largest 1% of earnings and stock returns. We adopt cross-industry empirical tests since we test whether the information content of sales on earnings and stock prices differ across industries. Sample firms are classified into 48 industries based on Fama and French (1997). Out of 48 Fama-French industries, 4 industries are excluded since those industries have less than 100 observations, and our industry-specific tests are based on the remaining 44 industries. Our final sample for the return tests consists of 80,698 observations over the period of 1983 through 2010.

Table 1 reports sample distributions. The first two columns report the industry names. Next three columns of the Table report the industry characteristics. In our sample, the banking industry has the largest number of observations (7,807). On average, 44 industry groups have $1.76 billion of market capitalization, and their average sales volume is $1.86 billion. The last column reports average earnings deflated by the beginning market value of equity. Out of 44 industries, five reported average losses during the test periods.

Table 1: Sample Statistics by Industry

Industry Name					
Short	**Long**	**Number of Observations**	**Market Value**	**Net Sales**	**Earning (%)**
Aero	Aircraft	497	3,911.7	5,273.8	4.99
Agri	Agriculture	234	796.9	703.2	2.66
Autos	Automobiles and Trucks	1,148	1,676.8	6,071.2	6.60
Banks	Banking	7,807	2,191.9	1,533.9	8.83
BldMt	Construction Materials	1,699	954.0	968.0	5.48
Books	Printing and Publishing	751	1,736.0	1,156.2	5.16
Boxes	Shipping Containers	247	1,017.2	1,851.1	5.40
BusSv	Business Services	6,481	1,882.9	876.6	0.10
Chems	Chemicals	1,583	2,159.1	2,449.0	5.72
Chips	Electronic Equipment	4,791	1,841.5	1,102.0	0.34
Clths	Apparel	1,081	659.8	778.2	5.60
Cnstr	Construction	896	609.5	1,357.4	6.58
Comps	Computers	3,022	2,227.3	1,439.5	-1.64
Drugs	Pharmaceutical Products	3,476	4,211.6	1,401.9	-4.77
ElcEq	Electrical Equipment	1,011	1,027.4	1,396.2	3.75
Enrgy	Petroleum and Natural Gas	3,332	3,954.3	5,732.3	2.35
FabPr	Fabricated Products	360	120.7	219.2	4.63
Fin	Financial Trading	4,255	1,111.4	606.1	6.36
Food	Food Products	1,376	2,387.5	3,279.5	7.60
Fun	Entertainment	982	735.0	520.2	0.21
Gold	Precious Metals	584	1,123.1	327.9	-3.05
Guns	Defense	188	2,055.6	3,482.4	3.81
Hlth	Healthcare	1,062	593.8	672.0	1.58
Hshld	Consumer Goods	1,333	2,458.1	1,679.7	4.04
Insur	Insurance	2,743	3,010.6	3,189.9	8.77
LabEq	Measuring and Control Eq	2,018	506.6	316.6	1.00
Mach	Machinery	2,938	982.7	969.8	2.24
Meals	Restaurants, Hotel, Motel	1,389	1,055.6	739.2	1.92
MedEq	Medical Equipment	2,373	935.1	350.2	-0.22
Mines	Nonmetalic Mining	420	1,087.5	1,554.1	14.73
Misc	Miscellaneous	651	8,238.0	4,356.6	-0.73
Paper	Business Supplies	1,367	1,887.4	2,203.8	6.13
PerSv	Personal Services	651	820.6	512.8	1.15
RlEst	Real Estate	799	322.1	174.1	0.52
Rtail	Retail	6,266	1,767.6	3,250.8	4.87
Rubbr	Rubber and Plastic Products	767	296.5	380.6	3.72
Ships	Shipbuilding, Railroad Eq	178	1,712.7	2,523.0	3.40
Soda	Candy and Soda	142	1,946.8	3,355.0	11.88
Steel	Steel Works, etc	1,195	1,171.8	2,012.2	6.16
Telcm	Telecommunications	1,772	5,975.4	4,718.25	7.09
Toys	Recreational Products	614	693.2	1,660.6	3.38
Trans	Transportation	1,891	1,596.5	1,919.8	6.53
Txtls	Textiles	494	309.4	591.4	4.34
Util	Utilities	3,834	1,821.6	2,008.6	9.65
	Mean	1,834	1,763.2	1,856.0	4.07

Table 1 shows descriptive statistics. Sample firms are classified into 44 industries, following the industry classification by Fama and French (1997). Last three columns of the Table show, by industry, average market capitalization at the beginning of the year, net sales amount, both at millions of dollars, and net income before extraordinary items as a percentage of beginning market value.

RESULTS AND DISCUSSION

The Incremental Information Content of Sales

For each industry, we run separate regressions described by equations (1) and (2), and additionally one on sales changes alone. Table 2 shows the results. Panel A reports the results for the full sample. The regression on earnings, sales, and the interaction, shows a 30% (I=23.1) increase in R^2 over the regression on earnings alone, though regressing on earnings shows a distinctively greater R^2 over the regression on sales alone. Panel B shows that out of 44 industries 6 exhibit more than 50% increases in R^2 due to sales. For 5 of these 6 industries the R^2 from the regression on sales alone is higher than that from the regression on earnings alone. Panel C shows results for 32 industries for which the increases in R^2 due to sales are between 10% and 50%, and 6 industries show less than 10% increases in R^2 in Panel D. Two things are notable from Table 2. First, the incremental information content of sales is significant. The median increase in R^2 due to sales is 38% (I=27.7%), which is greater than the full sample figure of 30%. Second, there are significant differences in the magnitude of the information content of sales across industries as mentioned above. Panel E shows the coefficients estimates for regression (2). Among 44 industries, the estimate of α_1 is positive for all industries with mean 0.61 (median 0.58), the estimate of α_2 is positive for 43 industries with mean 0.12 (median 0.11), and the estimate of α_3 is positive for 31 industries with mean 0.06 (median 0.08). This implies that for most industries returns are positively affected by earnings and sales, and the two effects are complementary to each other.

Table 2 : Regressions of Return on Contemporaneous Sales and Income

Models:		
	Income Regression Model:	$R_t = \alpha_0 + \alpha_1\Delta Y_t + \varepsilon$
	Income-Sales Regression Model:	$R_t = \alpha_0 + \alpha_1\Delta Y_t + \alpha_2\Delta S_t + \alpha_3\Delta Y_t\,\Delta S_t + \varepsilon$
	Sales Regression Model:	$R_t = \alpha_0 + \alpha_1\Delta S_t + \varepsilon$

Panel A: Pooled Cross-Sectional Sample

	Income			Income-Sales				Sales	
	I	ΔY	R^2	ΔY	ΔS	ΔYΔS	R^2	ΔS	R^2
All	0.2313	0.6109	0.0452	0.5580	0.1073	0.0382	0.0588	0.1394	0.0214

Panel B: Industries with R^2 Increase by More Than 50%

	Income			**Income-Sales**				**Sales**	
Industry	**I**	**ΔY**	**R^2**	**ΔY**	**ΔS**	**ΔYΔS**	**R^2**	**ΔS**	**R^2**
Boxes	0.8386	0.2065	0.0100	0.2795	0.1224	-0.1914	0.0617	0.1501	0.0419
PerSv	0.5874	0.4160	0.0220	0.4317	0.2381	-0.1446	0.0534	0.2320	0.0292
Mines	0.5687	0.3474	0.0267	0.1949	0.2629	-0.1239	0.0619	0.2570	0.0546
RlEst	0.5454	0.2253	0.0137	0.2021	0.0880	0.1377	0.0301	0.1121	0.0167
Fun	0.5155	0.3708	0.0148	0.3432	0.1117	0.1042	0.0305	0.1201	0.0163
Hlth	0.5007	0.5337	0.0307	0.5228	0.2152	0.0144	0.0615	0.2195	0.0319

Panel C: Industries with R^2 Increase by More Than 10%

	Income			**Income-Sales**				**Sales**	
Industry	**I**	**ΔY**	**R^2**	**ΔY**	**ΔS**	**ΔYΔS**	**R^2**	**ΔS**	**R^2**
Aero	0.4551	0.8048	0.0730	0.7503	0.2151	0.4824	0.1339	0.2767	0.0692
Telcm	0.4452	0.3119	0.0229	0.2967	0.1564	-0.0778	0.0412	0.1686	0.0246
Toys	0.4308	0.7244	0.0754	0.7076	0.1874	0.0285	0.1325	0.2002	0.0621
Hshld	0.4265	0.7666	0.0618	0.7543	0.1942	0.2065	0.1078	0.2454	0.0514
Cnstr	0.3810	0.7553	0.0789	0.6252	0.0857	0.2527	0.1274	0.1432	0.0570
Food	0.3717	0.9792	0.0730	0.7645	0.1166	0.2525	0.1161	0.1483	0.0545
MedEq	0.3631	0.7415	0.0439	0.6490	0.2532	0.1380	0.0689	0.3287	0.0353
Rtail	0.3490	0.7074	0.0458	0.6583	0.0865	0.0968	0.0703	0.1056	0.0292
Agri	0.3318	0.7598	0.0814	0.4712	0.2023	0.3187	0.1218	0.3380	0.0727
Guns	0.3315	0.8387	0.0676	0.6539	0.1136	0.2154	0.1011	0.1955	0.0654
Util	0.3279	0.4343	0.0308	0.4427	0.0751	-0.1353	0.0458	0.0741	0.0162
Drugs	0.3269	0.5354	0.0151	0.4746	0.2265	-0.0971	0.0224	0.2470	0.0107
ElcEq	0.3234	0.6570	0.0525	0.5947	0.1566	-0.0067	0.0776	0.1858	0.0359
Books	0.3087	0.5598	0.0466	0.6244	0.1344	0.0921	0.0674	0.1402	0.0164
Comps	0.2934	0.6428	0.0501	0.5741	0.2143	0.0130	0.0709	0.2647	0.0320
FabPr	0.2905	1.1117	0.1211	1.0737	0.1146	0.5166	0.1706	0.1918	0.0556
BusSv	0.2635	0.6061	0.0388	0.5819	0.1193	0.1189	0.0526	0.1568	0.0173
Steel	0.2555	0.4960	0.0516	0.3907	0.0830	0.0875	0.0693	0.1290	0.0322
Paper	0.2548	0.5178	0.0468	0.4420	0.0843	0.0510	0.0628	0.1223	0.0282
Fin	0.2458	0.5011	0.0474	0.4235	0.1415	0.0283	0.0628	0.2026	0.0305
Txtls	0.2404	0.6711	0.0829	0.7326	0.0478	0.2477	0.1091	0.1026	0.0231
Chems	0.2344	0.5381	0.0366	0.5034	0.1101	-0.0359	0.0478	0.1244	0.0157
Autos	0.2309	0.6253	0.0470	0.5296	0.0578	0.1320	0.0611	0.1087	0.0259
Clths	0.2281	0.6038	0.0474	0.5880	0.0798	0.1262	0.0614	0.1138	0.0184
Misc	0.2147	0.5099	0.0650	0.4881	0.1060	-0.1073	0.0827	0.0977	0.0185
BldMt	0.2058	0.9607	0.0969	0.8161	0.0900	0.1133	0.1220	0.1571	0.0523
Mach	0.1907	0.6641	0.0543	0.5720	0.1031	0.0981	0.0672	0.1603	0.0273
Chips	0.1806	0.7057	0.0526	0.6148	0.1498	0.0281	0.0642	0.2272	0.0269
Trans	0.1702	0.5722	0.0481	0.5480	0.0700	0.0906	0.0579	0.0820	0.0105
LabEq	0.1668	0.9083	0.0785	0.7791	0.2073	0.1118	0.0942	0.3518	0.0402
Rubbr	0.1439	0.7975	0.1089	0.7140	0.0810	0.0699	0.1272	0.1241	0.0393
Ships	0.1059	0.7295	0.0771	0.8257	-0.0662	0.0951	0.0863	-0.0025	0.0000

Panel D: Industries with R^2 Increase by Less Than 10%									
	Income			**Income-Sales**				**Sales**	
Industry	**I**	**ΔY**	**R^2**	**ΔY**	**ΔS**	**ΔYΔS**	**R^2**	**ΔS**	**R^2**
Insur	0.0929	0.6259	0.0501	0.6163	0.0674	-0.0451	0.0552	0.0763	0.0079
Banks	0.0843	0.8265	0.0525	0.7951	0.0955	-0.0845	0.0573	0.1190	0.0086
Enrgy	0.0841	0.5252	0.0504	0.4978	0.0525	0.0484	0.0550	0.0895	0.0095
Meals	0.0808	0.6907	0.0796	0.6919	0.0821	0.0027	0.0866	0.0813	0.0068
Soda	0.0667	1.3233	0.2158	2.0742	0.0501	-0.8309	0.2313	0.1836	0.0397
Gold	0.0011	0.4952	0.0499	0.4947	0.0121	-0.0108	0.0500	0.0410	0.0005
Panel E: Summary of Industry-Specific Regressions									
	Income			**Income-Sales**				**Sales**	
	I	**ΔY**	**R^2**	**ΔY**	**ΔS**	**ΔYΔS**	**R^2**	**ΔS**	**R^2**
Mean	0.2967	0.6437	0.0576	0.6093	0.1226	0.0552	0.0804	0.1635	0.0309
Median	0.2770	0.6344	0.0502	0.5850	0.1109	0.0787	0.0673	0.1492	0.0287

Table 2 shows return regressions by industry such that $R_t = \alpha_0 + \alpha_1\Delta Y_t + \alpha_2\Delta S_t + \alpha_3\Delta Y_t\Delta S_t + \varepsilon$, where R_t is the stock return during the year t, ΔS_t is the sales change and ΔY_t is the contemporaneous income change. Panel A shows the regression results from the pooled cross sectional sample. The first two columns report industry name and I measure. I measure is computed as 1 – R^2(income model)/ R^2(income-sales model). The third and fourth columns report the estimated slope coefficient and R^2 from the income model. Next four columns (the last two columns) report results from the income-sales (sales) model. Panel B (C and D) lists industries with increase in R^2 by more than 50% (more than 10%, and less than 10% each) between the income regression and the income-sales regression

Regression of Future Earnings

Table 3 shows the results of the regressions of year *t+1* earnings on year *t* earnings and sales. Panel A shows the full sample result: there is 7.48% (*H*=7.0%) increase in R^2 due to sales, the estimates of β_1 (b_1) and β_2 (b_2) are negative and significant, and the estimate of β_3 (b_3) is positive and significant. Panel B shows that the separate industry regressions show much greater overall incremental explanatory power of sales and again wide differences across industries. The median increase in R^2 due to sales is 19.3% (*H*=16.1%), which are much greater than the full sample result of 7.0%. This seems to be a result of significant heterogeneity across industries. The standard deviation of *H* is 0.230 which is much greater than the standard deviation 0.166 of *I*. The value of *H* ranges from 0.5% for transportation industry to 97.5% for defense industry. Panel B also shows the coefficients estimates for regression (5). Among 44 industries, the estimate of β_1 (b_1) is predominantly negative and is in general very significant with mean -0.22 (median -0.21). This is expected because it mainly reflects the negative autocorrelation of earnings changes. The estimate of β2 (b2) is positive for 20 industries and negative for 24 industries. The mean b2 is -0.008 (median -0.003). The result that the mean b2 is close to zero is disappointing but it shows the heterogeneity across industries in the association between current sales and future earnings.

Table 3: Predictions of Future Income by Industry

Model 1: $\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \varepsilon$												
Model 2: $\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \beta_2 \Delta S_t + \beta_3 \Delta Y_t\, \Delta S_t + \varepsilon$												
Panel A: Pooled Cross-Sectional Sample												
			Model 1						**Model 2**			
	I	H	**ΔYt**	**t-value**	**R2**	**ΔYt**	**t-value**	**ΔSt**	**t-value**	**ΔYt ΔSt**	**t-value**	**R^2**
	0.231	0.070	-0.216	-58.35***	0.041	-0.218	-58.32***	-0.008	-6.01***	0.051	15.91***	0.044
Panel B: By Industry												
	Model 1					**Model 2**						
	I	**H**	**ΔYt**	**t-value**	**R^2**	**ΔYt**	**t-value**	**ΔSt**	**t-value**	**ΔYt ΔSt**	**t-value**	**R^2**
Boxes	0.839	0.049	-0.230	-4.38***	0.073	-0.240	-4.26***	0.019	0.98	0.021	0.46	0.076
PerSv	0.587	0.160	-0.188	-4.67***	0.033	-0.198	-4.86***	-0.028	-1.40	0.061	1.66**	0.039
Mines	0.569	0.801	0.101	2.19**	0.011	-0.006	-0.11	0.036	1.10	0.159	2.81***	0.057
RlEst	0.545	0.069	-0.332	-9.46***	0.101	-0.325	-9.06***	0.003	0.18	0.095	2.52***	0.108
Fun	0.516	0.105	-0.191	-5.08***	0.026	-0.192	-5.11***	0.018	1.58	-0.032	-0.84	0.029
Hlth	0.501	0.053	-0.323	-9.61***	0.080	-0.318	-9.38***	-0.026	-1.88	-0.046	-1.06	0.085
Aero	0.455	0.179	-0.340	-6.94***	0.089	-0.297	-5.87***	-0.026	-1.48	0.189	3.04***	0.108
Telcm	0.445	0.419	-0.160	-6.58***	0.024	-0.211	-7.86***	0.057	4.24***	0.045	2.26**	0.041
Toys	0.431	0.566	-0.133	-3.4***	0.019	-0.101	-2.54***	-0.033	-2.62***	0.107	3.67***	0.043
Hshld	0.427	0.392	-0.227	-8.69***	0.054	-0.183	-6.88***	-0.059	-6.08***	0.143	5.07***	0.088
Cnstr	0.381	0.201	-0.322	-8.74***	0.079	-0.347	-9.22***	0.010	1.16	0.098	3.81***	0.099
Food	0.372	0.544	-0.121	-4.32***	0.013	-0.154	-5.28***	0.022	4.50***	0.026	1.24	0.029
MedEq	0.363	0.052	-0.257	-12.79***	0.065	-0.266	-13.11***	0.025	2.27**	0.023	0.86	0.068
Rtail	0.349	0.018	-0.257	-18.58***	0.052	-0.255	-18.33***	-0.003	-1.21	-0.017	-1.86**	0.053
Agri	0.332	0.277	-0.165	-2.19**	0.020	-0.192	-2.20**	-0.035	-0.88	0.125	1.25	0.028
Guns	0.332	0.975	-0.048	-0.54	0.002	0.087	0.87	-0.060	-2.52***	0.177	2.83***	0.061
Util	0.328	0.210	-0.164	-10.24***	0.027	-0.192	-11.47***	0.003	0.66	0.057	4.66***	0.034
Drugs	0.327	0.043	-0.185	-10.74***	0.032	-0.193	-10.96***	0.022	2.00**	0.001	0.05	0.034
ElcEq	0.323	0.015	-0.229	-7.21***	0.049	-0.240	7.01***	0.003	0.27	0.022	0.88	0.050
Books	0.309	0.715	-0.089	-2.1**	0.006	-0.148	-3.16***	-0.013	-0.68	-0.111	-2.66***	0.021
Comps	0.293	0.100	-0.287	-14.99***	0.069	-0.280	-14.45***	-0.030	-2.90***	0.092	4.72***	0.077
FabPr	0.291	0.326	-0.207	-3.62***	0.035	-0.175	-3.00***	-0.026	-1.71**	0.149	2.24**	0.052
BusSv	0.264	0.180	-0.193	-15.67***	0.037	-0.180	-14.51***	-0.030	-6.03***	0.077	5.93***	0.045
Steel	0.256	0.255	-0.138	-4.67***	0.018	-0.167	-5.29***	0.009	0.84	0.052	2.39***	0.024
Paper	0.255	0.135	-0.237	-9.25***	0.059	-0.243	-9.20***	0.029	3.39***	-0.050	-2.51***	0.068
Fin	0.246	0.204	-0.195	-11.7***	0.031	-0.210	-12.18***	-0.015	-1.59	0.095	5.88***	0.039
Txtls	0.240	0.051	-0.376	-7.85***	0.111	-0.350	-6.81***	-0.027	-1.79**	0.044	0.98	0.117
Chems	0.234	0.138	-0.133	-5.5***	0.019	-0.137	-5.63***	0.010	1.11	-0.051	-2.17**	0.022
Autos	0.231	0.248	-0.275	-7.7***	0.049	-0.267	-7.16***	-0.019	-2.13**	0.108	4.34***	0.066
Clths	0.228	0.039	-0.242	-7.86***	0.054	-0.252	-8.01***	0.009	0.92	-0.046	-1.50	0.056
	I	**H**	**ΔYt**	**t-value**	**R^2**	**ΔYt**	**t-value**	**ΔSt**	**t-value**	**ΔYt ΔSt**	**t-value**	**R^2**
Misc	0.215	0.035	-0.292	-7.27***	0.075	-0.290	-7.16***	-0.019	-1.16	0.034	1.18	0.078
BldMt	0.206	0.135	-0.312	-10.99***	0.066	-0.313	-10.62***	-0.017	-2.37***	0.078	4.27***	0.077
Mach	0.191	0.115	-0.229	-11.7***	0.045	-0.217	-10.67***	-0.024	-3.41***	0.053	2.89***	0.050
Chips	0.181	0.354	-0.196	-12.67***	0.032	-0.191	-12.01***	-0.036	-4.74***	0.140	9.24***	0.050
Trans	0.170	0.005	-0.146	-5.93***	0.018	-0.145	-5.87***	-0.003	-0.42	0.000	0.01	0.018
LabEq	0.167	0.333	-0.263	-11.19***	0.059	-0.212	-8.72***	-0.108	-7.94***	0.082	3.22***	0.088
Rubbr	0.144	0.299	-0.294	-7.32***	0.065	-0.340	-8.27***	0.016	1.51	0.141	4.40***	0.093
Ships	0.106	0.130	-0.329	-4.00***	0.083	-0.379	-4.26***	0.033	1.44	-0.057	-0.60	0.096
Insur	0.093	0.163	-0.186	-9.71***	0.033	-0.200	-10.31***	0.007	1.09	0.046	3.33***	0.040
Banks	0.084	0.112	-0.188	-13.64***	0.023	-0.185	-13.28***	-0.014	-2.74***	0.064	4.70***	0.026
Enrgy	0.084	0.089	-0.175	-9.60***	0.027	-0.185	-9.98***	0.016	2.05	0.023	1.19	0.030
Meals	0.081	0.109	-0.268	-9.71***	0.064	-0.276	-9.99***	-0.002	-0.14	-0.069	-3.11***	0.071
Soda	0.067	0.758	-0.167	-3.10***	0.064	-0.200	-1.53	0.100	6.12***	-0.069	-0.55	0.266
Gold	0.001	0.312	-0.336	-8.07***	0.101	-0.333	-8.15***	-0.155	-4.78***	0.208	2.88***	0.146
Mean	0.297	0.238	-0.217	-7.90	0.048	-0.220	-7.47	-0.008	-0.57	0.052	1.910	0.065
Median	0.277	0.161	-0.217	-7.86	0.047	-0.210	-7.94	-0.003	-0.55	0.053	2.250	0.055

*Table 3 reports results of income prediction models such as Model 1 : $\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \varepsilon$, and Model 2 : $\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \beta_2 \Delta S_t + \beta_3 \Delta Y_t \Delta S_t + \varepsilon$ where ΔY_t is the income change at period t and ΔS_t is the income change at period t. The first column lists industry, sorted by the size of I measure as in Table 2. H measure in the third column is computed similarly to the I measure, such that $H = 1 - R^2(\text{model 1})/ R^2(\text{model 2})$. Fourth to sixth column reports estimated slope coefficient, t-value and R^2 from the model 1. Next seven columns reports results for the model 2. The significance level is not directly marked in the Table due to narrow columns. *** (**) significant at 1% (5%) confidence level*

The estimate of β_3 (b_3) is positive for 34 industries and negative for 10 industries. The mean b_3 is 0.052 (median 0.053). This shows that for a majority of industries, b_3 is positive and significant. As discussed in Section 2, this result can be interpreted as evidence of income smoothing, either though accounting means or through operational decisions such as choosing the timing of adopting a measure in relation to current earnings.

Table 4: Timeliness of Sales and Income Information

Model: R^2's from (1) Δs_t or $\Delta y_t = \Delta_0 + \delta_1 R_t + E$ Vs. (2) Δs_t or $\Delta y_t = \Delta_0 + \delta_1 R_{t-1} + \delta_2 R_{t-2} + E$							
		R^2 from ΔS_t on			R^2 from ΔY_t on.		
Industry	**I**	**R_t**	**R_{t-1} and R_{t-2}**	**TLS**	**R_t**	**R_{t-1} and R_{t-2}**	**TLY**
Boxes	0.8386	0.0419	0.0068	0.8600	0.0100	0.0125	0.4442
PerSv	0.5874	0.0292	0.0071	0.8039	0.0220	0.0047	0.8240
Mines	0.5687	0.0546	0.0230	0.7036	0.0267	0.0103	0.7212
RlEst	0.5454	0.0167	0.0143	0.5382	0.0137	0.0001	0.9905
Fun	0.5155	0.0163	0.0049	0.7698	0.0148	0.0115	0.5631
Hlth	0.5007	0.0319	0.0019	0.9428	0.0307	0.0106	0.7432
Aero	0.4551	0.0692	0.0231	0.7501	0.0730	0.0263	0.7350
Telcm	0.4452	0.0246	0.0054	0.8190	0.0229	0.0008	0.9661
Toys	0.4308	0.0621	0.0050	0.9249	0.0754	0.0049	0.9393
Hshld	0.4265	0.0514	0.0279	0.6481	0.0618	0.0154	0.8007
Cnstr	0.3810	0.0570	0.0143	0.7996	0.0789	0.0048	0.9430
Food	0.3717	0.0545	0.0008	0.9864	0.0730	0.0125	0.8534
MedEq	0.3631	0.0353	0.0035	0.9101	0.0439	0.0124	0.7797
Rtail	0.3490	0.0292	0.0053	0.8475	0.0458	0.0034	0.9314
Agri	0.3318	0.0727	0.0030	0.9606	0.0814	0.0321	0.7172
Guns	0.3315	0.0654	0.0006	0.9903	0.0676	0.0015	0.9777
Util	0.3279	0.0162	0.0010	0.9403	0.0308	0.0002	0.9953
Drugs	0.3269	0.0107	0.0005	0.9594	0.0151	0.0044	0.7746
ElcEq	0.3234	0.0359	0.0136	0.7248	0.0525	0.0135	0.7956
Books	0.3087	0.0164	0.0135	0.5490	0.0466	0.0052	0.8995
Comps	0.2934	0.0320	0.0095	0.7711	0.0501	0.0140	0.7816
FabPr	0.2905	0.0556	0.0093	0.8565	0.1211	0.0123	0.9078
BusSv	0.2635	0.0173	0.0047	0.7864	0.0388	0.0124	0.7578
Steel	0.2555	0.0322	0.0329	0.4947	0.0516	0.0311	0.6239
Paper	0.2548	0.0282	0.0419	0.4027	0.0468	0.0038	0.9256
Fin	0.2458	0.0305	0.0052	0.8547	0.0474	0.0014	0.9713
Txtls	0.2404	0.0231	0.0463	0.3329	0.0829	0.0029	0.9660
Chems	0.2344	0.0157	0.0049	0.7634	0.0366	0.0172	0.6803
Autos	0.2309	0.0259	0.0350	0.4250	0.0470	0.0120	0.7972
Clths	0.2281	0.0184	0.0338	0.3520	0.0474	0.0129	0.7856
Misc	0.2147	0.0185	0.0041	0.8184	0.0650	0.0318	0.6717
BldMt	0.2058	0.0523	0.0201	0.7224	0.0969	0.0060	0.9413
Mach	0.1907	0.0273	0.0231	0.5420	0.0543	0.0097	0.8491
Chips	0.1806	0.0269	0.0071	0.7915	0.0526	0.0166	0.7606
Trans	0.1702	0.0105	0.0032	0.7651	0.0481	0.0066	0.8791
LabEq	0.1668	0.0402	0.0127	0.7596	0.0785	0.0038	0.9542
Rubbr	0.1439	0.0393	0.0103	0.7932	0.1089	0.0174	0.8620
Ships	0.1059	0.0000	0.0308	0.0004	0.0771	0.0122	0.8634
Insur	0.0929	0.0079	0.0070	0.5309	0.0501	0.0049	0.9115
Banks	0.0843	0.0086	0.0013	0.8728	0.0525	0.0033	0.9407
Enrgy	0.0841	0.0095	0.0113	0.4582	0.0504	0.0112	0.8175
Meals	0.0808	0.0068	0.0149	0.3127	0.0796	0.0082	0.9062
Soda	0.0667	0.0397	0.0027	0.9361	0.2158	0.0295	0.8800
Gold	0.0011	0.0005	0.0072	0.0702	0.0499	0.0084	0.8560
Mean	0.2967	0.0309	0.0126	0.7009	0.0576	0.0108	0.8338

Table 4 reports the timeliness measure by industry. The first and the second columns list industry name and I measure. The third column reports R^2 from the contemporaneous regression of $\Delta S_t = \delta_0 + \delta_1 R_t + \varepsilon$, where ΔS_t is the sales change at year t and R_t is the return of year t. The fourth column reports R^2 from the lagged regression of $\Delta S_t = \delta_0 + \delta_1 R_{t-1} + \delta_2 R_{t-2} + \varepsilon$. TLS in the next column is the timeliness measure of sales as estimated by the contemporaneous R^2 as a ratio of total of the contemporaneous R^2 and the lagged R^2. Last three columns report the timeliness measure of income changes. Similarly to TLS, R^2 is estimated from the regression models of $\Delta Y_t = \delta_0 + \delta_1 R_t + \varepsilon$ and $\Delta Y_t = \delta_0 + \delta_1 R_{t-1} + \delta_2 R_{t-2} + \varepsilon$, and TLY is the R^2 of the contemporaneous model as a ratio of total of the contemporaneous R^2 and the lagged R^2.

The Timeliness of Sales and Earnings

Table 4 shows the estimates of the timeliness of sales and earnings for industries. Our timeliness measure is the R^2 of the regression of sales (or earnings) changes on contemporaneous return R_t as a ratio the R^2 of the regression of sales (or earnings) on lagged returns, R_{t-1} and R_{t-2}. This measure represents the degree of freshness of sales (or earnings) information to the market. For example, the sales timeliness measure becomes zero if the sales number is already known to investors before the year of the earnings recognition, and is one if sales become known only as they are realized and thus recognized in firms' books. Table 4 shows that while on average 83% of earnings information is incorporated into price in the current year, only 70% of sales information is learned by the market in the current year. In other words, 30% of the sales information is known to the market before the beginning of the year whereas only 17% of the earnings information is known in advance. This asymmetric timeliness of sales and earnings would result in a decrease in the information content of sales incremental to earnings as discussed in Section 3.

Factors That Influence the Information Content of Sales

Table 5: Correlations Among the Industry-Specific Estimates (N=44)

Variables	I	H	a_1	a_2	a_3	b_1	b_2	b_3	TLS	TLY
I		0.041	-0.437	0.552	0.097	0.162	0.152	0.088	0.414	-0.389
		0.790	0.003	0.001	0.530	0.294	0.325	0.571	0.005	0.009
H	0.039		0.306	0.136	-0.140	0.644	-0.018	0.273	0.213	0.208
	0.801		0.043	0.379	0.365	<.0001	0.900	0.073	0.166	0.177
a_1	-0.382	0.182		-0.223	-0.283	-0.056	0.166	-0.136	0.107	0.268
	0.010	0.238		0.145	0.063	0.721	0.283	0.380	0.489	0.079
a_2	0.643	0.130	-0.160		0.080	0.318	-0.110	0.240	0.591	-0.241
	<.001	0.400	0.300		0.608	0.036	0.478	0.120	<.0001	0.116
a_3	0.142	0.094	0.381	-0.016		-0.085	-0.410	0.379	-0.108	0.081
	0.357	0.543	0.011	0.920		0.584	0.006	0.011	0.484	0.601
b_1	0.137	0.429	-0.100	0.273	-0.094		0.015	0.133	0.417	-0.036
	0.374	0.004	0.519	0.073	0.545		0.923	0.388	0.005	0.816
b_2	0.051	-0.174	-0.203	-0.202	-0.286	-0.043		-0.544	0.158	-0.115
	0.740	0.260	0.186	0.191	0.060	0.784		0.001	0.307	0.460
b_3	0.152	0.483	0.041	0.231	0.302	0.05	-0.566		0.143	0.092
	0.324	0.001	0.789	0.131	0.046	0.748	<.001		0.354	0.552
TLS	0.402	0.166	0.029	0.482	-0.104	0.327	-0.021	0.111		-0.080
	0.007	0.281	0.852	0.001	0.503	0.030	0.890	0.475		0.606
TLY	-0.179	0.210	0.309	-0.324	0.117	-0.112	-0.086	0.114	0.007	
	0.244	0.171	0.042	0.032	0.449	0.468	0.578	0.461	0.964	

Table 5 reports the Pearson correlation coefficients above diagonal, and the Spearman rank correlation coefficients below diagonal, followed by p-values below. I is computed as $1 - R^2$(Income Regression)/ R^2(Income-Sales Regression) from the contemporaneous return regression models as in Table 2. H is measured such that $H = 1 - R^2$(model 1)/ R^2(model 2) from the future income prediction models as in Table 3. a_1, a_2 and a_3 are estimated slope coefficients from the return regression model on contemporaneous income and change in Table 2: $R_t = \alpha_0 + \alpha_1 \Delta Y_t + \alpha_2 \Delta S_t + \alpha_3 \Delta Y_t\, \Delta S_t + \varepsilon$ where R_t is the stock return during the year t, ΔS_t is the sales change and ΔY_t is the income change at year t. b_1, b_2 and b_3 are estimated slope coefficients from the future income prediction model of $\Delta Y_{t+1} = \beta_0 + \beta_1 \Delta Y_t + \beta_2 \Delta S_t + \beta_3 \Delta Y_t\, \Delta S_t + \varepsilon$. TLS and TLY are the estimated timeliness measure of ΔS_t and ΔY_t.

Table 5 shows the correlations among our major variables of interest, namely, the R^2 and coefficients of the return and future earnings regressions, *I, H,* a_1, a_2, a_3, b_1, b_2, b_3 and the timeliness of sales and earnings, *TLS* and *TLY*. We are mainly interested in this paper in how our measure of the incremental information content, *I*, is associated with the way sales are related to immediate future earnings, namely, b_2 and b_3, and the timeliness of sales and earnings, *TLS* and *TLY* . We first consider b_2 and b_3. First, note from Table 2 that a_2 and a_3 are both significantly positive and from Table 5 that a_2 is significantly positively correlated with *I*. If year *t+1* earnings are related with current earnings and sales in a similar way that returns are related to current earnings and sales, *I* will be positively associated with b_2 and b_3. From Table 5 we see that a_2 and *TLS* are significantly positively correlated with each other, while a_2, b_3 and *TLY* are not significantly correlated.

Table 6: Multiple Regression for I Measure (N=44)

Model : I = $\Gamma_0 + \Gamma_1 b_1 + \Gamma_2 b_2 + \Gamma_3 b_3 + \Gamma_4 tls + \Gamma_5 tly$ + E		
Variables	Coefficient	t-value
Intercept	0.520	2.64***
b_1	-0.037	-0.13
b_2	0.555	1.76**
b_3	0.317	0.88
TLS	0.244	2.28**
TLY	-0.497	-2.66***
Adjusted R^2	22.59%	

*Table 6 reports the regression results of I measure on several estimates. I is estimated as 1 – $R^2(\Delta Y)/R^2(\Delta Y$ and $\Delta S)$ from the return regressions as in Table 2. H is computed from the future income prediction model as in Table 3. b_1, b_2 and b_3 are estimated coefficients from the regression model of $\Delta Y_{t+1} = \beta_0 + \beta_1\Delta Y_t + \beta_2\Delta S_t + \beta_3\Delta Y_t\,\Delta S_t + \varepsilon$. TLS and TLY are the estimated timeliness measure of ΔS_t and ΔY_t. *** (**) significant at 1% (5%) confidence level*

Table 6 shows the result of the multivariate regression of *I* on b_1, b_2, b_3, *TLS*, and *TLY* in equation (7). It shows that the estimate of γ_2 (the coefficient on b_2) is significantly related to the *I* measure after controlling the timeliness of sales and earnings. It also shows that b_3 is not significantly associated with *I*. This implies that the significantly positive b_3, which we interpreted as consistent with income smoothing, is not a factor of the information content of sales incremental to earnings. The coefficient on *TLS* is positive and significant at the 1% level (one-tail) as expected. It implies that the sales information adds more explanatory power on return beyond earnings when the current sales have not been known to the market during previous years. On the contrary, the coefficient on *TLY* is negative and significant at the 1% level (one-tail) as expected, implying that the more current returns reflect current earnings information, there is less room for sales to be incrementally informative.

CONCLUDING COMMENTS

The purpose of this study is to examine the industry specific determinants of the information content of sales incremental to earnings in explaining stock returns. We use firms with annual accounting and stock return information available at the Compustat since 1980. We perform cross-industry study by classifying sample firms into 48 industries following and French (1997). We show that adding sales to earnings in return regressions results in an average increase in the explanatory power of accounting variable(s) by 57% across industries. Considering the moderate explanatory power of sales alone, this suggests that the informational use of sales is intimately related to earnings. Moreover, we show evidence that the way sales are related to earnings and influence stock returns are significantly different from one industry to another. There are thus reasons to believe that research in this direction would be fruitful in learning how investors use accounting information.

Empirical results imply that when sales are strong (weak), firms make operational or accounting decisions that result in a decrease (increase) in the immediately following period's earnings relative to earnings of more remote future periods independently of current earnings. This study, among other things, provides strong evidence that the incremental power of sales in explaining return beyond the earnings information depends on the timeliness of earnings and sales. The incremental R^2 in industry specific return regressions, i.e. the *I* measure, is positively related to the timeliness of sales and negatively to the timeliness of earnings. Future studies may research industry-specific characteristics that determine the explanatory power of sales beyond earnings information.

REFERENCES

Ball, R. and Brown, P. (1968) "An Empirical Evaluation of Accounting Income Numbers." *Journal of Accounting Research* 6, 159-178.

Beaver, W. (1968) "The information content of annual earnings announcements." *Journal of Accounting Research* 6, 67-92.

Bhojraj, S., Lee, C. and Oler, D., (2003) "What's My Line? A Comparison of Industry Classification Schemes for Capital Market Research" *Journal of Accounting Research* 41, 745-774.

Biddle, G. and Seow, G. (1991) "The Estimation and Determinants of Associations between Returns and Earnings: Evidence from Cross-Industry Comparisons." *Journal of Accounting, Auditing and Finance* 6, 183-232.

Curtis, A. B., Lundholm, R. L., and McVay, S. E. (2014) "Forecasting Sales: A Model and Some Evidence from Retail Industry." *Contemporary Accounting Research* 31. 581-608.

Davis, A. (2002) "The Value Relevance of Revenue for Internet Firms: Does Reporting Grossed-up or Barter Revenue Make a Difference?" *Journal of Accounting Research* 40 No. 2, 445-477.

Etimur Y. and Livnat, J. (2002) "Confirming or Conflicting Sales and Earnings Signals." *The Journal of Portfolio Management,* 45-56.

Etimur Y., Livnat, J., and Martikainen, M. (2003) "Differential Market Reactions to Revenue and Expense Surprises." *Review of Accounting Studies* 8, 185-211.

Fairfield, P. and Yohn, T. (2001) "Using Asset Turnover and Profit Margin to Forecast Changes in Profitability." *Review of Accounting Studies 6*, 371–385.

Fama, E. and French, F. (1997) "Industry Cost of Equity." *Journal of Financial Economics* 43, 153-193.

Ghosh A., Gu, Z., and Jain, P. (2005) "Sustained Earnings and Revenue Growth, Earnings Quality, and Earnings Response Coefficients." *Review of Accounting Studies.* 33-57.

Hopwood, W. and McKeown, J. (1985) "The Incremental Information Content of Interim Expenses over Interim Sales." *Journal of Accounting Research* 23, 161-174.

Kim, O., Lim, S., and Park, T. (2009) "Measuring the Impact of Sales on Earnings and Equity Price." *Review of Quantitative Finance and Accounting* 32, 145-168.

Nissim, D. and Penman, S. (2001) "Ratio Analysis and Equity Valuation." *Review of Accounting Studies* 6, 109–154.

Penman, S. (1992). "Financial Statement Information and the Pricing of Earnings Changes." *The Accounting Review* 67, 563–577.

Penman, S. (2001). "Discussion of 'Back to Basics: Forecasting the Revenues of Internet Firms' and 'A Rude Awakening: Internet Shakeout in 2000'" *Review of Accounting Studies* 6, 361-364.

Rees L. and Sivaramakrishnan, K. (2007) “The Effect of Meeting or Beating Revenue Forecasts on the Association Between Quarterly Returns and Earnings Forecast Errors.” *Contemporary Accounting Research* 24, 259-290.

Swaminathan, S. and J. Weinthrop. (1991) “The Information Content of Earnings, Revenues, and Expenses.” *Journal of Accounting Research* 29, 418-427.

Trueman, B. Wong, M., and Zhang, X. (2000) “The Eyeballs Have It: Searching for the Value in Internet Stocks.” *Journal of Accounting Research* 38, 137-162.

Trueman, B., Wong, M., and Zhang, X. (2001). “Back to Basics: Forecasting the Revenues of Internet firms.” *Review of Accounting Studies* 6, 305–329.

ACKNOWLEDGEMENT

I would like to thank the journal editor and two anonymous referees for their insightful comments. Any remaining errors are my own.

BIOGRAPHY

Dr. Taewoo Park is an Assistant Professor at Georgia Gwinnett College. His research appears in journals such as *Journal of Accounting and Economics, Journal of Accounting and Public Policy, Journal of Accounting, Auditing and Finance, Review of Quantitative Finance and Accounting* and etc. He can be contacted at: School of Business, Georgia Gwinnett College, 1000 University Center Lane, Lawrenceville GA 30043. Phone: (404) 413-7219.