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Ji Li
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W.P. Carey School of Business
Arizona State University

will discuss

"The Use of DuPont Analysis by Market Participants"

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The Use of DuPont Analysis by Market Participants

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Replicated by Ji Li, Ph.D. Student

Arizona State University

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Abstract

This paper replicates Mark Soliman's (2008) paper entitled with "The Use of DuPont Analysis by Market Participants." DuPont analysis, as a form of financial statement analysis, decomposes return on net operating assets into two multiplicative components: profit margin and asset turnover. This paper investigates the information effects of individual DuPont component on the capital market from three perspectives. Firstly, this paper confirms that the information content of individual DuPont components is incremental to the reported aggregate accounting signals in predicting future earnings. Second, by examining the immediate and future equity return responses to the disclosure of DuPont components the author explores equity investors' use of such information in the market. Finally, to further confirm the usefulness of the decomposition of DuPont ratios the author also investigates analysts' usage of DuPont information via examining the contemporaneous forecast revision as well as future forecast errors in response to the availability of such ratios. The resulting associations between the DuPont components and stock returns as well as analyst forecast revisions indicate the usefulness of such information to both equity investors and analysts. However, predictable future abnormal returns and future forecast errors lend support to the market participants' incomplete information compounding of DuPont components.

1. Introduction

A DuPont analysis decomposes a firm's return on net operating assets (*RNOA*) into profit margin (*PM*) and asset turnover (*ATO*) where *RNOA=PM*ATO*. The argument is that *PM* and *ATO*, as accounting signals, measure different aspects about a firm's operations. Profit margin (*PM*) is an indicator of a company's pricing strategies and reflects how well it controls costs and pricing power in the market. Differences in competitive strategy and product mix cause the profit margin to vary across different companies. However, asset turnover (*ATO*) measures the efficiency of a company's asset utilization in generating sales revenue or sales income for the company. *ATO* thus reflects the efficient use of property, plant, and equipment, efficient inventory control and effective working capital management. High profit margins attracts competitors and are relatively easy to be drawn back to normal levels by new entrants to the market or by imitations of the new ideas from existing rivals. Conversely, efficient deployment of assets is a more challenging task to the manager and it requires implementation of a carefully executed long-term management process; consequently, it is harder to be imitated by the competitors. In addition, prior studies document that these two components have explanatory power in predicting changes in future profitability of the firms. Empirical research also has shown that asset turnover is more persistent than profit margin and that changes in *ATO* are predictive of future changes in *RNOA* after controlling for *RNOA* (e.g. Fairfield and Yohn 2001; Nissim and Penman 2001; Penman and Zhang 2003). Soliman (2008) begins with a replication of Fairfield and Yohn (2001) to investigate whether this finding is robust after considering existing earnings predictors and controlling for the fundamental signals from Abarbanell and Bushee (1997) and accrual decomposition from Richardson et al. (2005). He finds that change in *ATO* is still significant in explaining future changes in *RNOA*. Hence changes in *ATO* provide additional information in predicting future changes in *RONA*.

An interesting research question follows immediately: If *PM* and *ATO* provide incremental explanatory power with respect of future earnings, then do main market participants; *i.e.*, the equity analysts and investors, use such information in their decisions? The paper then proceeds to offer a comprehensive examination on investor and financial analyst reactions to the availability of DuPont components disclosure.

To address investors' response to the availability of DuPont ratios, both a long- and a short-window association tests are conducted to study the association between stock market returns and the disclosure of DuPont components. The long-window association tests show that the DuPont components are incremental to earnings and earnings changes in explaining contemporaneous returns. The short-window test shows that changes in the DuPont components are informative to the investors and incremental to the earnings surprises upon disclosure. These results suggest that DuPont components provide incremental information on values to the investors and are associated with market reactions within a small window around the earnings announcement. In a long-window future return test the information in the change of *ATO* was found to be associated with an average annual abnormal return of about 2 percent, which implies that the market does not seem to fully use such information upon disclosure.

To test the usefulness of such information on analysts' forecast, the author proposes tests to examine the associations between the DuPont ratios and analysts' current forecast revisions and future forecast errors. The argument is quite straightforward: if such information is relevant and pertinent to analysts, then it should be incorporated into analysts' decisions in formulating the future forecasts or forecast revisions. Soliman (2008) first examines analyst forecast revision which measures the change in the forecast of next year's earnings immediately before and after the current year's earnings announcement and its association with the changes in *ATO*. He finds that analysts' revision is positively associated with changes in *ATO* after controlling for the earnings surprise. He then looks at the future forecast errors of year *t+1* earnings and examine whether analyst fully understand the implications of the DuPont components for future profitability. Soliman finds that although analysts appear to revise their forecasts of future earnings consistent with the information in these DuPont components, predictable association between future forecast errors and DuPont components seems to suggest that the revisions were incomplete. Though the information is relevant to valuation, the finding suggests that neither equity investors nor analysts fully utilize the information of DuPont components upon disclosures.

The main objective of this exercise is to replicate the study of Soliman (2008). The original research of Soliman (2008) requires data sets that pool from CRSP, COMPUSTAT and I/B/E/S. As a first year doctoral student, I believe that such a replication exercise allows me more opportunities to be exposed to three of the most important dataset for the empiricists in accounting research. My genuine interest in managerial accounting research is also consistent with the spirit of the paper which focuses on studying the value relevancy of inventory or capital asset management of the firms. The paper is organized as follows. Section II describes the predictions and research design. Section III provides the replications on empirical analyses. Section IV outlines a rough idea on my future research pertinent to this replication exercise.

2. Predictions and Research Design

Exploring the association between returns and earnings and predicting the cross sectional returns based on firm profitability measures have long been keen interests for financial researchers. Since the seminal work of Ball and Brown (1968) and Beaver (1968), a large number of studies investigate how earnings and returns are connected. Lipe (1986) and Kormendi and Lipe (1987) find that more transitory components have a smaller association with stock returns by decomposing earnings into six components.

In order to help to predict future earnings, researchers have conducted fundamental analyses to find current financial statement information (Penman 1992; Lee 1999). Ou and Penman (1989) summarize a large number of financial ratios into one summary measure and estimate its association with future stock returns. Sloan (1996) decomposes earnings into cash flows from operations and operating accruals, and finds that firms with high accruals underperform firms as compared to low accruals in the U.S. He finds that stocks with large positive accruals in a given year tend to have low returns in subsequent years. Work by Fairfield and Yohn (2001) shows that disaggregating the change in return on assets into the change in profit margin and the ΔATO is useful in forecasting the ΔRNOA one year ahead, while disaggregating return on assets into asset turnover and profit margin does not provide incremental information. Nissim and Penman (2001) demonstrated that *RNOA* seem to have been driven more by *ATO* than *PM* during the period of 1963-1984, whereas, from 1984 to 1999 RNOA is mainly driven by PM.

However, median ATO stays reasonably constant within this subsample period. Penman and Zhang (2003) show that ∆ATO rather than ∆PM adds explanatory power to the ∆RNOA.

Abarbanell and Bushee (1997, 1998) extend the work of Lev and Thiagarajan (1993) by examining the correspondence of a group of financial ratios with contemporaneous long-window stock returns. They find that some variables can predict future earnings changes and returns, and are employed by analysts in practice. Richardson *et. al.* (2005) find that investing accruals are more effective than operating accruals in predicting future earnings and returns. With a variety of methods predicting future earnings and equity returns, there is no a unifying framework guiding the process. Therefore, this paper intends to investigate the role of the DuPont components in predicting future earnings and returns, while controlling accruals and a group of financial ratios.

2.1. Predictions of Future RNOA Using DuPont Components

The first section of the analysis examines whether the earlier findings of Fairfield and Yohn (2001) are incremental and robust to other earnings predictors. Fairfield and Yohn (2001) find that ∆ATO is positively associated with future ∆RNOA. Conversely, PM and ATO add no explanatory power on the ∆RNOA. Increases in ATO imply the increase of the usage efficiency of invested capital and can bring in more sales from assets. Thus, profitability from ATO increase tends to persist. Two groups of control variables are included in the examination. First, Abarbanell and Bushee (1997) reveal that some earnings prediction signals are incrementally associated with contemporaneous stock returns and are significantly helpful in predicting future earnings, so those fundamental signals are included as a group of control variables. Second, to examine whether accruals are related to the information in the DuPont information, three components of total accruals, working capital accruals (*WC*), noncurrent operating accruals (*NCO*) and financing accruals (*FIN*), are included following Richardson *et al.* (2005). Soliman first estimates the following level regression of the ΔRNOA on the DuPont components.

$$\Delta RNOA_{t+1} = \rho_0 + \rho_1 RNOA_t + \rho_2 PM_t + \rho_3 ATO_t + \rho_4 \Delta RNOA_t + \rho_5 \Delta NOA_t + \upsilon_{t+1} \quad (1)$$

Next, to examine whether the explanatory power for predicting future ΔRNOA comes from ΔPM and ΔATO or $\Delta RNOA$, Soliman estimates the following changes regression similar to Fairfield and Yohn's (2001), but includes $\Delta RNOA$ to explore whether changes in the DuPont components are incremental.

$$\Delta RNOA_{t+1} = \rho_0 + \rho_1 RNOA_t + \rho_2 \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4 \Delta RNOA_t + \rho_5 \Delta NOA_t + \upsilon_{t+1} \quad (2)$$

Because pooled regressions are subject to estimated biases due to cross-sectional correlation in the residuals, all the regression analyses in this paper are conducted by using the Fama-MacBeth regression approach. In addition, because of the serial correlation in the annual coefficient estimates, the standard errors are adjusted by using Newey and West standard errors (Newey and West, 1987). Therefore, employing Fama-MacBeth regression coupled with Newey and West standard errors adjusts for cross-sectional correlation in the residuals and serial correlation in the annual coefficient estimates.

2.2. Use of Information by Equity Investors

If the information in the components of DuPont analysis is robust, then do stock market participants impound such information in predicting future earnings? Particularly, do they utilize *ΔATO* in their decision making? In this section, to examine the association between such information and equity returns, Soliman uses long- and short-window return tests.

Soliman explores whether the DuPont components are incrementally useful to investors by examining the contemporaneous relation between earnings and market equity returns. In the specification of returns-earnings regression, many papers include both level and change of earn (Amir and Lev 1996; Francis and Schipper 1999). In light of the importance of ROE (algebrally equivalent to RNOA) in valuation (Ohlson 1995), RNOA and ΔRNOA are added into the model, regression (3) is setup to examine whether RNOA is incrementally informational to earnings and whether the DuPont components are incrementally informational to both RNOA and earnings.

$$R_t = \rho_0 + \rho_1 EARN_t + \rho_2 \Delta EARN_t + +\rho_3 RNOA_t + +\rho_4 \Delta RNOA_t + \rho_5 PM_t + \rho_6 ATO_t + \rho_7 \Delta PM_t + \rho_8 \Delta ATO_t + \epsilon_t \quad (3)$$

where:

R_t = stock returns are measured using compounded buy-hold market-adjusted returns (raw returns minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's first fiscal year and ending at the end of the fiscal year *t*.

$EARN_t = EPS_t/P_{t-1}$; earnings before extraordinary items per share in year *t*, deflated by the equity price per share at the end of fiscal year *t-1*;

$\Delta EARN_t = \Delta EPS_t/P_{t-1}$; the change of earnings before extraordinary items per share from year *t-1* to year *t*, deflated by the equity price per share at the end of fiscal year *t-1*.

In light of the finding that prices lead earnings (Beaver et al. 1980), future earnings are included as independent variables (Warfield and Wild 1992; Fama 1990). Thus, in the spirit of Kothari and Sloan (1992) and Collins et al. (1994), future levels of RNOA, PM and ATO are included in the model as control variables for returns.

$$R_t = \rho_0 + \rho_1 EARN_t + \rho_2 \Delta EARN_t + +\rho_3 RNOA_t + \rho_4 \Delta RNOA_t + \rho_5 PM_t + \rho_6 ATO_t + \rho_7 \Delta PM_t + \rho_8 \Delta ATO_t + \rho_9 RNOA_{t+1} + \rho_{10} PM_t + \rho_{11} ATO_{t+1} + \epsilon_t \quad (4)$$

2.2.1. Short-window Return Tests

To address whether DuPont components add timely information to market participants, the author further conducts a short window analysis on the association between five-day return and changes in DuPont components. We would be able to find whether the source of earnings useful to market investors around the time of the earnings announcements. Thus, short-window return test examines unexpected return reaction to the changes in DuPont components as well as earnings surprise and change in RNOA.

$$UR_t = \rho_0 + \rho_1 SUR_t + \rho_2 \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4 \Delta RNOA_t + \epsilon_t \quad (5)$$

Where UR_t = compounded buy-hold market-adjusted returns inclusive of dividends and other distributions computed over the five-day window surrounding the earnings announcement beginning two days before and ending two days after the annual earnings announcement for fiscal year *t*;

SUR_t = Annual Earnings Surprise; the most recent median forecast of annual earnings for year t deflated by the equity price at the end of year *t-1*.

2.2.2. Future Return Tests

A stream of literature shows that market participants sometimes could not understand the implications of current earnings mapping into future earnings (see Bernard and Thomas 1989; Sloan 1996; Doyle et al. 2003). To examines whether investors understand the future implications of *ΔRNOA* on stock prices, the author proposes regressing future returns on current changes in $RNOA_t$ and DuPont components

$$R_{t+1} = \rho_0 + \rho_1 \Delta RNOA_t + \rho_2 \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4\, RSST\ Controls + \rho_5\, RNOA_t + \rho_6 PM_t + \rho_7 ATO_t + \rho_8 Fama\_French\ Risk\ Factors + \epsilon_{t+1} \quad (6)$$

R_{t+1} =stock returns are measured using compounded buy-hold market-adjusted returns (raw returns minus the corresponding value-weighted return), inclusive of dividends and other distributions beginning four months and ending sixteen months after the end of the fiscal year *t*.

The Fama-French risk factors of book-to-market (BM), firm size (MVE), and β (beta) (Fama and French 1993) are included in the model to control for risk. In addition, the accrual variables such as working capital (WC), noncurrent operating (NCO) and financing (FIN) have been shown to be strong predictors of future abnormal returns (Richardson *et al.*, 2005). Consequently, these variables are included in the model as part of the control variables. In the original paper, rank regressions are used in the tests where the continuous value of the independent variable is replaced with its annual decile rank. In creating decile ranks, all the continuous variables are sorted annually into ten equal-sized groups numbered 0 to 9 and then divided by 9. The advantage of this rank regression allows for easy interpretation of the absolute value of the coefficient estimate as the hedge value moving between the extreme deciles (Bernard and Thomas 1989). If market investors fully appreciate the predictive power of the DuPont variables, then their coefficients are expected to be zero.

2.3. Use of Information by Equity Analysts

A primary task of equity analyst is to predict future earnings, and it is expected that their forecasts contain all relevant information. However, some studies show that analysts do not fully incorporate relevant accounting information available at the time of their forecast decision making. Lys and Sohn (1990), Klein (1990), and Abarbanell (1991) all find that analysts underreact to past information reflected in prices. Another stream of research investigates whether market anomalies can be attributable to the way equity analysts process accounting information. Abarbanell and Bernard (1992) find that analyst forecasts under-react to earnings, but the biases are not large enough to explain the post-earnings announcement drift thoroughly. Bradshaw et al. (2001) find that equity analysts do not fully understand the lower persistence of accruals, either. Abarbanell and Bushee (1998) find that equity analysts do not fully incorporate the information in the fundamental variables.

However, another stream of research indicates that it is the equity investors that inefficiently utilize analysts' earnings forecasts in predicting future earnings. Mendenhall (1991), Walther (1997) and Elgers et al. (2001, 2003) document that investors underweigh analysts' forecasts. Therefore, tests of stock returns and analysts' forecasts are different tests and both necessary. In order to test whether analysts fully comprehend the implications of DuPont components, Soliman considers two approaches of analyst tests. They are complementary and provide two levels of examination of analysts' use of information. The analyst revision regression tests whether analysts use the information in revising forecasts, while the future forecast error regression tests whether analysts fully capture all the information in the components.

The first approach is to examine whether the DuPont components information is linked with analyst revision of their prior forecast. Soliman tests whether the DuPont components are associated with analyst forecast revisions of future earnings of period *t+1* immediately before and after the earnings announcement of year *t*. This test is used to tell whether the DoPont information is associated with analysts revising their prior forecasts. It is anticipated that significant coefficients on the DuPont components indicate that these ratios are informative for analysts to revise their priors about the future earnings forecasts of the firm.

$$ANAL\_REV_t = \rho_0 + \rho_1 SUR_t + \rho_{27} \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4 \Delta RNOA_t + \epsilon_t$$

(7)

where $ANAL\_REV_t$ = analyst revision to the consensus analyst forecast of year t+1 earnings after year t earnings are announced. It is the difference of the first median

I/B/E/S consensus and the last median consensus of one-year-ahead forecast surrounding the announcement of year t earnings, deflated by share price at the end of fiscal year t-1.

The second approach (equation 8) examines whether analysts completely use the DuPont components to predict future profitability by testing whether future forecast errors for period *t+1* are predictable, according to the research design of Bradshaw, Richardson, and Sloan (2001). If analysts fully capture the information in the DuPont components when forecasting earnings, then the coefficients on DuPont components are expected to be zero.

$$FE_{t+1} = \rho_0 + \rho_1 \Delta RNOA_t + \rho_2 PM_t + \rho_3 ATO_t + \rho_4 \Delta PM_t + \rho_5 \Delta ATO_t + \epsilon_{t+1}$$

(8)

Where FE_{t+1} = forecast error is the realized earnings for year *t+1* minus the median forecast earnings from the month prior to the announcement of *t+1* earnings, scaled by the stock price at the end of the month of the earnings announcement for year t.

3. Empirical Results

3.1 Sample and Variables

The sample period in Soliman's paper is from 1984 to 2002. Financial statement information is retrieved from the Compustat annual database, stock returns are extracted from the Center for Research in Security Prices (CRSP) stock returns files, and analyst forecast data are drawn from I/B/E/S. Financial companies are deleted from the sample since DuPont analysis does not apply to these firms. Firm-years with negative NOA and operating income are excluded from the sample as well. After constructing all the variables needed in the analysis, the final sample contains 18,689 firm-years.

In addition to the variables described in section 2, other control variables are also included in the model. Return of net operating asset (*RNOA*) is the operating income before interest divided by average net operating assets. *RNOA* is decomposed into multiplicative components of *PM*, which is operating income divided by sales and *ATO*, which is sales divided by average *NOA*. Net operating asset (*NOA*) is operating assets minus operating liabilities. Operating assets is total assets less cash and short-term investments. Operating liabilities is total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest. Growth in net operating assets is the change of *NOA* from year t-1 to year t, scaled by *NOA* at year *t-1*. According to Soliman, all financial variables are winsorized at 1 percent and 99 percent to dampen the effect of outliers on the regression analysis.

Descriptive statistics are shown in Table 1. As to *PM* and *ATO*, overall their means are larger than the medians, suggesting positive skewness. This is probably due to the fact that the required coverage by I/B/E/S are on average larger firms; in addition analysts tend to follow larger and more profitable firms (McNichols and O’Brien 1997). Pearson correlations and Spearman correlations between the variables of interest are shown in Table 2. We notice that there is a strong negative correlation between *PM* and *ATO* for both Pearson and Spearman correlations, consistent with Soliman’s result.

3.2 Future RNOA changes

Table 3 shows the prediction of future changes in RNOA. The four models in Panel A employ levels of PM and ATO. Model 1, replicating Fairfield and Yohn (2001), uses changes in RNOA and NOA as control variables. The fundamental signals from Abarbanell and Bushee (1997) for earnings prediction are included in model 2. Model 3 controls for the changes of working capitals, NCO and FIN from Richarson et al. (2005), and model 4 includes all the control variables from model 2 and model 3. In all the four models, consistent with prior literature, neither PM nor ATO predicts future changes in RNOA except that in the model 1, ATO positively predicts future increases in RNOA. All of the fundamental signals are consistent in sign and significance in my replication compared to Abarbanell and Bushee's paper. In general, the significance of RSST variables is consistent with Soliman's work with one exception. Variable ΔFIN is insignificant only in Soliman's model 4, but in my replication it is insignificant in both model 3 and model 4.

Panel B of Table 3 presents the results of changes speciation. All four models show that ΔATO is positive and significant in predicting future changes in RNOA. After controlling for all the earnings predictors in Abarbanell and Bushee (1998) and Richardson et al. (2005), the predictive power of the ΔATO remains statistically significant. This indicates that changes in asset turnover reflect that innovations in ATO represent increases in the efficiency of asset usage in generating revenues, thus bringing in new information in predicting future changes in profitability. Therefore, ΔATO captures changes in firm operating efficiency.

3.3 Stock Return Tests

The results of the long-window association tests of Equation (3) are shown in Table 4. My replication results show that both EARN and ΔEARN are significant in explaining returns, while Soliman finds that only ΔEARN is significant in explaining returns, whereas EARN is not. However, my findings are consistent with prior literature that indicates variable *EARN* to be significant (e.g., Amir and Lev 1986). RNOA and ΔRNOA are added to the Model 2 as different measures of profitability, and they are found significant in the association with market adjusted abnormal returns. RNOA is viewed as a better measure of economic performance (e.g., Penman and Zhang, 2003; Fairfield and Yohn 2001; Nissim and Penman 2001; Richardson et al. 2006; Fairfield et al. 2003). Adding these two measures increases the adjusted R^2 by more than 11% and an F-test shows that this increase in statistically significant.

In model 3, PM and ATO are added to the regression model, and both components are not significant, which is contrary to Soliman's findings. However, significant RNOA seems to have captured the information contained in its parts. Then when DuPont component changes are added in the model 4, ΔATO is significant and positive, but ΔRNOA is still significant. The results show that both ΔATO and ΔPM drive the predictive power of ΔRNOA in models 2 and 3, while Soliman considers only ΔATO as the driver. Table 4 highlights several findings. First, ΔATO and ΔRNOA are significantly associated with contemporaneous returns, which is consistent with the earnings prediction results. Second, adding RNOA to EARN significantly increases the explanatory power of the return regression. Lastly, both ΔPM and ΔATO are significant in explaining contemporaneous returns.

Regarding the analysis of whether future levels of PM and ATO in year t+1 are associated with contemporaneous returns in year t, Table 5 reports the results. Significant coefficient on ATO_{t+1} indicates that this future component is significant and incremental to current and future earnings. Again, this finding confirms the importance of asset turnover as an informative ratio on the performance of the firm. RNOA remains significant after adding the current and future levels of its components, PM and ATO. Market investors positively price current and future ATO and the efficient deployment of capital.

Table 6 investigates the short-window return reactions to DuPont components. In model 1, the coefficient on annual earnings surprise (*SUR*) is positive and significant as expected, which suggests that abnormal return moves in the same direction as annual earnings surprises goes. The adjusted R^2 0.8% is as four times as the R^2 in the original paper. In model 2, both ΔPM and ΔATO are significant and positive, consistent with the results of future earnings forecast in Panel B of Table 3. Changes in *ATO* and abnormal returns are positively related around the earnings announcement, which holds after controlling for the change of profitability ($\Delta RNOA$).

Table 7 explores a trading strategy. The untabulated results of rank regression turn out to be insignificant. Two reasons can explain this. First, after converting all the independent variables into its annual decile rank, the new independent variables are not different enough to capture the association with the dependent variable. Second, transforming the independent variable into rank numbers may lose some information. Therefore, I also run the Fama-MacBeth regression and the results are presented by Table 7.

Model 1 shows positive association between *ΔATO* and future abnormal stock returns, which indicates that market investors do not seem to fully appreciate the predictive power of *ΔATO* for future changes in profitability. The coefficient of *ΔATO* suggests that a trading strategy optimizing the information in *ΔATO* would result in a hedge return of about 2.4 percent for every one unit increase of asset turnover after controlling for *ΔRNOA* and the three Fama and French risk factors. Therefore, it is inference that market investors do not fully comprehend the persistent characteristic of the changes of asset efficiency measured by *ΔATO*.

3.4 Analyst Forecast Revision Tests

Table 8 presents the examination that whether analyst forecast revisions are associated with the DuPont components. The estimate coefficient of earnings surprise is positive and significant, which implies that analyst revise their future earnings forecast consistent with the change of the earnings surprise. When the DuPont components are added, *ΔATO* is the only DuPont component that is positive and significant, implying that changes in *ATO* positively predict future changes in profitability. Therefore, analysts are revising their forecasts in a way consistent with the predictive properties of *ΔATO*.

Table 9 shows the results of explaining future forecast errors. Both *ΔPM* and *ΔATO* are statistically significant. Both the levels and changes of the components have power on predicting future profitability. The positive coefficient on *ΔATO* implies that analysts' forecast errors seem to be predicted by *ΔATO* on average. It lends support to the idea that analysts do not fully impound the information in this variable.

4. Implications and Future Research

Soliman (2008) provides strong evidences on the value relevancy of DuPont components. From managerial accounting's perspective, business strategies and management practices often are long-term oriented; consequently it could be a challenging task to measure or quantify such management practices in a periodic report of earnings. However, as subtle as it could be, all managerial accounting decisions (whether they are about cost reduction efforts or revenue enhancing strategies) will surely leave traces and be imbedded in the details of the balance sheet and/or periodic income statement reported. I speculate that in some circumstances that a balance sheet which reports the cumulative past activities of a firm could be relatively more "informative" than the typical periodic income statement.

As evidenced by Soliman's work on asset turnover (*ATO*) to future value study, I plan to further explore how past managerial decisions and activities may help us better understand the linkage between managerial accounting decisions and valuation implications in the market. As an example, majority of accrual accounting researches in financial accounting focus exclusively in studying the "abnormal accruals" and its linkage to future returns or accrual reversals. In such studies, researchers mainly correlated the current changes in accruals (abnormal) to future returns (abnormal). From managerial accounting's perspective, accruals are simply "outcomes" of real management (not necessarily earnings management) decisions. A firm's inventory strategy, changes in supplier partnerships and strategic alignments with suppliers and customers could have a far more drastic impact on "long-term" consequences of inventory turnovers then simple "earnings management". Similarly, changes in profit margin and sales are driven by explicit business strategies of a firm and consequently affect the patterns of receivable and payables in financial accounting. An annual change in “accruals” accounts will not be able to properly reflect such a “long-term” business decision made by mangers. Can we envision a design that is possibly able to discern or characterize some of the managerial practices patterns and then consequently mapping such patterns to changes in value in the future? In other words, can we provide a vehicle that can bridge the gap between managerial and financial accounting research? I believe Soliman’s work gives a window of opportunity in pursuit of such research.

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TABLE 1
Descriptive Statistics

	Mean	Std. Dev.	25^{th} Pctl	Median	75^{th} Pctl
NOA_t	1685.33	6399.66	75.167	241.838	950.105
$RNOA_t$	0.267	0.375	0.121	0.181	0.293
PM_t	0.129	0.092	0.065	0.106	0.171
ATO_t	2.586	2.638	1.209	1.999	3.085
$\Delta RNOA_t$	-0.018	0.256	-0.045	-0.004	0.028
ΔPM_t	-0.002	0.039	-0.015	0.000	0.013
ΔATO_t	-0.118	1.430	-0.226	-0.024	0.115
$ANAL\_REV_t$	0.046	5.161	-0.001	0.000	0.000
SUR_t	-0.282	35.803	-0.001	0.000	0.001
R_t	0.093	0.656	-0.222	-0.001	0.258
$EARN_t$	0.066	0.240	0.036	0.062	0.091
$\Delta EARN_t$	0.007	0.291	-0.016	0.003	0.019

The sample size is 18,689 firm-year observations from 1984-2002. Variables are winsorized at the 1 percent and 99 percent levels.

Variable definitions:

NOA	Net operating asset = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM	Profit Margin = Opearating Income/Total Sales.
ATO	Asset Turnover = $Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t$ - $RNOA_{t-1}$).
ΔPMt	Change in *Profit Margin* = PM_t - PM_{t-1}
ΔATO_t	Change *Asset turnover* = ATO_t - ATO_{t-1}
$ANAL\_REV_t$	*Analyst revision* of one-year-ahead earnings forecasts measured as the revision to the consensus analyst forecast of year *t*+1 earnings made just after year t earnings are announced. Specifically, it is the first median *I/B/E/S* consensus one-year-ahead forecast of year *t*+1 earnings minus the last median consensus of year *t*+1 earnings made directly before the announcement of year *t* earnings, all scaled by share price at the end of fiscal year *t*-1.
SUR_t	*Annual earnings surprise.* Calculated as annual *I/B/E/S* earnings – the most recent median forecast of annual earnings for year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
R_t	Stock returns are measured using compounded buy-hold market-adjusted returns (raw return minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's fiscal year and ending at the end of the fiscal year *t*.
$EARN_t$	EPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
$\Delta EARN_t$	ΔEPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* minus its annual earnings per share in year *t*-1 deflated by the market value of equity per share at the end of fiscal year *t*-1.

TABLE 2

Correlation Matrix: Pearson Correlation is shown above diagonal and Spearman Correlation is shown below diagonal

	$\Delta RNOA_{t+1}$	$\Delta RNOA_t$	PM_t	ATO_t	$RNOA_t$	$ANAL\_REV_t$	SUR_t	ΔPM_t	ΔATO_t	R_t
$\Delta RNOA_{t+1}$		0.032	-0.090	-0.175	-0.256	-0.001	-0.002	-0.043	0.055	0.033
$\Delta RNOA_t$	0.088		0.044	0.086	0.195	0.002	-0.001	0.360	0.716	0.191
PM_t	-0.178	0.138		-0.271	0.303	-0.002	0.002	0.216	0.017	0.083
ATO_t	-0.109	0.051	-0.473		0.538	-0.002	0.004	0.050	0.027	0.100
$RNOA_t$	-0.291	0.186	0.384	0.550		-0.001	0.003	0.137	0.084	0.137
$ANAL\_REV_t$	0.143	0.191	0.069	0.074	0.140		0.017	0.001	0.003	0.005
SUR_t	0.030	0.182	0.062	0.048	0.118	0.280		-0.001	-0.002	-0.002
ΔPM_t	-0.023	0.754	0.205	0.079	0.272	0.192	0.195		0.095	0.299
ΔATO_t	0.169	0.678	0.042	-0.006	0.021	0.104	0.082	0.235		0.097
R_t	0.055	0.413	0.159	0.103	0.264	0.249	0.140	0.409	0.229	

The sample size is 18,689 firm-year observations from 1984-2002. Variables are winsorized at the 1 percent and 99 percent levels.

Variable definitions:

NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM	(Profit Margin) = Opearating Income/Total Sales.
ATO	(Asset Turnover) = $Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t - RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$
$ANAL\_REV_t$	*Analyst revision* of one-year-ahead earnings forecasts measured as the revision to the consensus analyst forecast of year *t*+1 earnings made just after year t earnings are announced. Specifically, it is the first median *I/B/E/S* consensus one-year-ahead forecast of year *t*+1 earnings minus the last median consensus of year *t*+1 earnings made directly before the announcement of year *t* earnings, all scaled by share price at the end of fiscal year *t*-1.
SUR_t	*Annual earnings surprise*. Calculated as annual *I/B/E/S* earnings – the most recent median forecast of annual earnings for year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
R_t	Stock returns are measured using compounded buy-hold market-adjusted returns (raw return minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's fiscal year and ending at the end of the fiscal year *t*.

TABLE 3

Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Future One-Year-Ahead Change in RNOA ($\Delta RNOA_{t+1}$) on the DuPont Components

Panel A: Levels of DuPont Components

$$\Delta RNOA_{t+1}=\rho_0+\rho_1 RNOA_t+\rho_2 PM_t+\rho_3 ATO_t+\rho_4 \Delta RNOA_t+\rho_5 \Delta NOA_t +RSST\ Controls+AB\ Controls+v_{t+1}$$

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	0.028***	0.030***	0.032***	0.031***
	(10.86)	(10.47)	(9.22)	(10.67)
$RNOA_t$	-0.183***	-0.168***	-0.167***	-0.168**
	(-11.73)	(-9.65)	(-9.84)	(-9.30)
PM_t	-0.005	-0.038	-0.042	-0.036
	(-0.31)	(-1.31)	(-1.38)	(-1.17)
ATO_t	0.003***	0.002	0.001	0.002
	(2.97)	(1.56)	(1.22)	(1.27)
$\Delta RNOA_t$	0.116***	0.125***	0.094***	0.118***
	(10.65)	(8.74)	(6.47)	(8.71)
ΔNOA_t	-0.000***			
	(-9.34)			
ΔWC_t			-0.201***	-0.143***
			(-7.71)	(-8.05)
ΔNCO_t			-0.096*	-0.087*
			(-1.99)	(-2.01)
ΔFIN_t			-0.046	-0.037
			(-0.23)	(-0.20)
AB Controls	Not Included	Included	Not Included	Included
Adjusted R^2	15.4%	16.2%	15.5%	16.4%

Panel B: Changes in DuPont Compoents

$$\Delta RNOA_{t+1}=\rho_0+\rho_1 RNOA_t+\rho_2 \Delta PM_t+\rho_3 \Delta ATO_t+\rho_4 \Delta RNOA_t+\rho_5 \Delta NOA_t +RSST\ Controls+AB\ Controls+v_{t+1}$$

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	0.029***	0.030***	0.030***	0.031***
	(10.80)	(12.59)	(12.04)	(12.39)
$RNOA_t$	-0.161***	-0.158***	-0.158***	-0.158***
	(-13.86)	(-13.66)	(-13.07)	(-13.35)
ΔPM_t	-0.187***	-0.167***	-0.229***	-0.173***
	(-4.82)	(-3.07)	(-3.59)	(-3.12)
ΔATO_t	0.026***	0.028***	0.027***	0.028***
	(6.52)	(4.57)	(5.34)	(5.25)
$\Delta RNOA_t$	0.056***	0.055	0.043	0.050
	(3.47)	(1.59)	(1.68)	(1.66)
ΔNOA_t	-0.000***			
	(-10.49)			
ΔWC_t			-0.185***	-0.109***
			(-6.41)	(-6.89)
ΔNCO_t			-0.082*	-0.075*
			(-2.06)	(-2.08)
ΔFIN_t			-0.039	-0.026
			(-0.37)	(-0.57)
AB Controls	Not Included	Included	Not Included	Included
Adjusted R^2	16.6%	17.8%	17.2%	18.0%

*, **, and *** denote 10%, 5% and 1% significance level, respectively.

NOA	*Net operating asset*. It is measured as operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM	*Profit Margin*. It is calculated as Operating Income/Total Sales.
ATO	*Asset Turnover* = $Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t - RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$
$ANAL\_REV_t$	*Analyst revision* of one-year-ahead earnings forecasts measured as the revision to the consensus analyst forecast of year *t*+1 earnings made just after year t earnings are announced. Specifically, it is the first median *I/B/E/S* consensus one-year-ahead forecast of year *t*+1 earnings minus the last median consensus of year *t*+1 earnings made directly before the announcement of year *t* earnings, all scaled by share price at the end of fiscal year *t*-1.
SUR_t	*Annual earnings surprise*. Calculated as annual *I/B/E/S* earnings – the most recent median forecast of annual earnings for year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
R_t	Stock returns are measured using compounded buy-hold market-adjusted returns (raw return minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's fiscal year and ending at the end of the fiscal year *t*.
ΔWC_t	$WC_t - WC_{t-1}$. *WC* is calculated as Current Operating Assets (*COA*) - Current Operating Liabilities (*COL*), and *COA* = Current Assets - Cash and Short-Term Investments (*STI*), and *COL*=Current Liabilities - Debt in Current Liabilities.
ΔNCO_t	Change in net non-current operating assets is defined as $NCO_t - NCO_{t-1}$. NCO is calculated as Non-Current Operating Assets (*NCOA*) - Non-Current Operating Liabilities (*NCOL*), and *NCOA* = Total Assets - Current Assets - Investments and Advances , and *NCOL* = Total Liabilities - Current Liabilities – Long-Term Debt.
ΔFIN_t	Change in net financial assets is defined as $FIN_t - FIN_{t-1}$ and *FIN* = Financial Assets (*FINA*) - Financial Liabilities (*FINL*). *FINA* = Short-Term Investments (*STI*) + Long-Term Investments (LTI), and *FINL*= Long-Term Debt + Debt in Current Liabilities + Preferred Stock.

AB Controls are comprised of the following 7 variables:

AB_INV	= ΔInventory - ΔSales;
AB_AR	=ΔAccounts Receivable - ΔSales;
AB_CAPEX	=Average of ΔIndustry Capex - ΔFirm Capex ;
AB_GM	=ΔSales - ΔGross Margin ;
AB_ETR	= Effective Tax Rate $[(\frac{1}{3}\sum_{\tau=1}^{3} \mathrm{ETR}_{t-\tau}) - \mathrm{ETR}_t] * \Delta$EARNt, where ETRt $=\frac{\mathrm{TaxExpense}}{\mathrm{EBT}}$
AB_SandA	=ΔSelling and Admin Expenses - ΔSales;
AB_LF	=(Past Sales/past Employees – Sales/Employees)/(past Sales/past Employees).

TABLE 4

Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Contemporaneous Returns on DuPont Components

OLS Regression for Market-Adjusted Returns

$$R_t=\rho_0+\rho_1 EARN_t+\rho_2\Delta EARN_t+\rho_3 RNOA_t+\rho_4\Delta RNOA_t+\rho_5 PM_t+\rho_6 ATO_t + \rho_7\Delta PM_t+\rho_8\Delta ATO_t+\varepsilon_t$$

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	-0.058***	-0.123***	-0.114***	-0.084***
	(-3.28)	(-5.88)	(-4.12)	(-2.94)
$EARN_t$	2.109***	1.924***	1.978***	1.982***
	(9.42)	(10.33)	(10.85)	(10.79)
$\Delta EARN_t$	1.311***	0.594***	0.569***	0.226
	(11.09)	(3.48)	(3.14)	(1.19)
$RNOA_t$		0.363***	0.387***	0.386***
		(15.11)	(17.41)	(17.85)
$\Delta RNOA_t$		1.011***	1.009***	0.611***
		(13.70)	(13.38)	(7.35)
PM_t			-0.160	-0.325***
			(-1.54)	(-3.27)
ATO_t			0.001	-0.003
			(0.17)	(-0.91)
ΔPM_t				2.486***
				(8.89)
ΔATO_t				0.010***
				(2.83)
Adjusted R^2	15.0%	26.2%	26.8%	28.4%

R_t	Stock returns are measured using compounded buy-hold market-adjusted returns (raw return minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's fiscal year and ending at the end of the fiscal year *t*.
$EARN_t$	EPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
$\Delta EARN_t$	ΔEPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* minus its annual earnings per share in year *t*-1 deflated by the market value of equity per share at the end of fiscal year *t*-1.
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t $((NOA_t+NOA_{t-1})/2)$
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t - RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$

TABLE 5
Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Contemporaneous Returns of Future DuPont Components

OLS Regressions for Market-Adjusted Returns

$$R_t=\rho_0+\rho_1 EARN_t+\rho_2\Delta EARN_t+\rho_3 RNOA_t+\rho_4\Delta RNOA_t+\rho_5 PM_t+\rho_6 ATO_t$$
$$+\rho_7\Delta PM_t+\rho_8\Delta ATO_t+\rho_9 RNOA_{t+1}+\rho_{10}PM_{t+1}+\rho_{11}ATO_{t+1}+\varepsilon_t$$

Independent Variables	Model 1		Model 2	
Intercept	-0.096***	(-3.53)	-0.102***	(-3.63)
$EARN_t$	2.045***	(10.71)	2.081***	(10.48)
$\Delta EARN_t$	0.195	(1.11)	0.189	(1.13)
$RNOA_t$	0.049	(0.68)	0.165***	(3.28)
$\Delta RNOA_t$	0.609***	(7.42)	0.576***	(6.93)
PM_t	-0.355***	(-3.81)	-1.346***	(-4.91)
ATO_t	-0.006*	(-1.93)	0.017**	(2.11)
ΔPM_t	2.549***	(8.96)	2.609***	(8.84)
ΔATO_t	-0.006	(-0.49)	0.005	(0.37)
$RNOA_{t+1}$	0.437***	(4.54)	0.278***	(4.78)
PM_{t+1}			1.099***	(3.50)
ATO_{t+1}			0.022**	(2.67)
Adjusted R^2	29.7%		30.3%	

R_t	Stock returns are measured using compounded buy-hold market-adjusted returns (raw return minus the corresponding value-weighted return), inclusive of dividends and other distributions computed over the 12 months beginning in the first month of the firm's fiscal year and ending at the end of the fiscal year *t*.
$EARN_t$	EPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
$\Delta EARN_t$	ΔEPS_t / P_{t-1}. The firm's earnings before extraordinary items per share in year *t* minus its annual earnings per share in year *t*-1 deflated by the market value of equity per share at the end of fiscal year *t*-1.
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t - RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$

TABLE 6
Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Short-Window Unexpected Returns on the DuPont Components

$$UR_t = \rho_0 + \rho_1 SUR_t + \rho_2 \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4 \Delta RNOA_t + \epsilon_t$$

Independent Variables	Model 1	Model 2	Model 3
Intercept	0.008*** (6.46)	0.009*** (7.22)	0.009*** (7.11)
SUR_t	0.545*** (5.68)	0.526*** (5.18)	0.528*** (5.29)
ΔPM_t		0.058*** (3.17)	0.028 (0.88)
ΔATO_t		0.004** (2.60)	0.002** (2.14)
$\Delta RNOA_t$			0.015 (1.71)
Adjusted R^2	0.8%	1.0%	1.0%

UR_t	compounded buy-hold market-adjusted returns inclusive of dividends and other distributions computed over the five-day window surrounding the earnings announcement beginning two days before and ending two days after the annual earnings announcement for fiscal year t;
SUR_t	*Annual earnings surprise*. Calculated as annual *I/B/E/S* earnings – the most recent median forecast of annual earnings for year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$.
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t - RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$

TABLE 7

Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Future Forecast Errors on the DuPont Components

$$R_{t+1}=\rho_0+\rho_1\Delta RNOA_t+\rho_2\Delta PM_t+\rho_3\Delta ATO_t+\rho_4 RSST\ Contrals+\rho_5 RNOA_t+\rho_6 PM_t+\rho_7\Delta ATO_t+\rho_8 Fama\text{-}French\ Risk\ Factors_{+}\ \epsilon_{t+1}$$

Independent Variables	Model 1	Model 2	Model 3
Intercept	0.007 (0.45)	0.006 (0.43)	-0.004 (-0.26)
$\Delta RNOA_t$	-0.131 (-1.50)	-0.109 (-1.25)	-0.104 (-1.09)
ΔPM_t	0.288* (1.88)	0.260 (1.60)	0.262 (1.28)
ΔATO_t	0.024* (1.95)	0.020* (1.75)	0.020* (1.98)
ΔWC_t		-0.310** (-2.58)	-0.227** (-2.07)
ΔNCO_t		-0.139** (-2.39)	-0.098 (-1.09)
ΔFIN_t		-0.032 (-0.00)	0.025 (0.21)
$RNOA_t$			-0.021 (-0.59)
PM_t			0.066 (0.57)
ATO_t			0.003 (1.44)
Adjusted R^2	1.0%	1.6%	3.6%

R_{t+1}	stock returns are measured using compounded buy-hold market-adjusted returns (raw returns minus the corresponding value-weighted return), inclusive of dividends and other distributions beginning four months and ending sixteen months after the end of the fiscal year t
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t ((NOA_t+NOA_{t-1})/2)
$RNOA_t$	*Return on Net Operating Assets =* $PM_t * ATO_t$.

$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t*. ($RNOA_t$ - $RNOA_{t-1}$).
ΔPM_t	Change in *Profit Margin* = PM_t - PM_{t-1}
ΔWC_t	WC_t - WC_{t-1}. *WC* is calculated as Current Operating Assets (*COA*) - Current Operating Liabilities (*COL*), and *COA* = Current Assets - Cash and Short-Term Investments (*STI*), and *COL*=Current Liabilities - Debt in Current Liabilities.
ΔNCO_t	Change in net non-current operating assets is defined as NCO_t - NCO_{t-1}. NCO is calculated as Non-Current Operating Assets (*NCOA*) - Non-Current Operating Liabilities (*NCOL*), and *NCOA* = Total Assets - Current Assets - Investments and Advances, and *NCOL* = Total Liabilities - Current Liabilities – Long-Term Debt.
ΔFIN_t	Change in net financial assets is defined as FIN_t - FIN_{t-1} and *FIN* = Financial Assets (*FINA*) - Financial Liabilities (*FINL*). *FINA* = Short-Term Investments (*STI*) + Long-Term Investments (LTI), and *FINL*= Long-Term Debt + Debt in Current Liabilities + Preferred Stock.

TABLE 8

Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Analysts Forecast Revisions on the DuPont Components

$$ANAL\_REV_t = \rho_0 + \rho_1 SUR_t + \rho_2 \Delta PM_t + \rho_3 \Delta ATO_t + \rho_4 \Delta RNOA_t + \varepsilon_t$$

Independent Variables	Model 1	Model 2	Model 3
Intercept	-0.001***	-0.001***	-0.001***
	(-6.65)	(-6.43)	(-6.39)
SUR_t	0.121***	0.115***	0.115***
	(5.50)	(5.40)	(5.42)
ΔPM_t		0.016***	0.015***
		(11.69)	(9.16)
ΔATO_t		0.001**	0.001**
		(2.80)	(2.44)
$\Delta RNOA_t$			0.000
			(0.65)
Adjusted R^2	6.4%	7.4%	7.4%

$ANAL\_REV_t$	*Analyst revision* of one-year-ahead earnings forecasts measured as the revision to the consensus analyst forecast of year *t*+1 earnings made just after year t earnings are announced. Specifically, it is the first median *I/B/E/S* consensus one-year-ahead forecast of year *t*+1 earnings minus the last median consensus of year *t*+1 earnings made directly before the announcement of year *t* earnings, all scaled by share price at the end of fiscal year *t*-1.
SUR_t	*Annual earnings surprise.* Calculated as annual *I/B/E/S* earnings – the most recent median forecast of annual earnings for year *t* deflated by the market value of equity per share at the end of fiscal year *t*-1.
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
ΔNOA	$(NOA_t - NOA_{t-1})/NOA_{t-1}$
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t $((NOA_t+NOA_{t-1})/2)$
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t.* ($RNOA_t - RNOA_{t-1}$)
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$

TABLE 9

Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Future Forecast Errors on the DuPont Components

$$FE_{t+1}=\rho_0+\rho_1\Delta RNOA_t+\rho_2 PM_t+\rho_3 ATO_t+\rho_4\Delta PM_t+\rho_5\Delta ATO_t+\epsilon_{t+1}$$

Independent Variables	Model 1	Model 2	Model 3
Intercept	-0.005***	-0.002***	-0.005***
	(-3.85)	(-4.50)	(-3.79)
$\Delta RNOA_t$	0.002	-0.004*	-0.003*
	(1.28)	(-1.89)	(-1.98)
PM_t	0.013***		0.012***
	(3.22)		(3.11)
ATO_t	0.001***		0.001***
	(3.45)		(3.36)
ΔPM_t		0.025**	0.017*
		(2.43)	(2.02)
ΔATO_t		0.001*	0.001*
		(1.84)	(2.08)
Adjusted R^2	1.0%	0.8%	1.4%

FE_{t+1}	forecast error is the realized earnings for year *t+1* minus the median forecast earnings from the month prior to the announcement of *t+1* earnings scaled by the stock price at the end of the month of the earnings announcement for year t.
NOA	(Net operating asset) = operating assets minus operating liabilities. Operating assets is calculated as total assets less cash and short-term investments. Operating liabilities is calculated as total assets, less the long- and short-term portions of debt, less book value of total common and preferred equity, less minority interest.
PM_t	Operating Income/Total Sales
ATO_t	$Sales_t$/Average NOA_t $((NOA_t+NOA_{t-1})/2)$
$RNOA_t$	*Return on Net Operating Assets* = $PM_t * ATO_t$
$\Delta RNOA_t$	Change in *RNOA* from year *t-1* through *t.* ($RNOA_t - RNOA_{t-1}$)
ΔPM_t	Change in *Profit Margin* = $PM_t - PM_{t-1}$
ΔATO_t	Change *Asset turnover* = $ATO_t - ATO_{t-1}$