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The Implications of Accounting Distortions and Growth for Accruals and Profitability

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ABSTRACT: Following Sloan (1996), numerous studies document that the accrual component of earnings is less persistent than the cash flow component of earnings. Disagreement exists, however, as to the explanation for this result. One stream of literature follows Sloan's lead in arguing that this result is attributable to accounting distortions (Xie 2001; Dechow and Dichev 2002; Richardson et al. 2005). A second stream of literature argues that this result is attributable to a more general growth effect and that growth-related factors such as diminishing returns to new investment explain the lower persistence of accruals (e.g., Fairfield et al. 2003a; Cooper et al. 2005). We provide new evidence indicating that temporary accounting distortions are a significant contributing factor to the lower persistence of the accrual component of earnings. Our evidence indicates that the lower persistence of accruals extends to accruals that are unrelated to sales growth and that extreme accruals are systematically associated with alleged cases of earnings manipulation.

Keywords: *accruals; earnings management; conservative accounting; aggressive accounting.*

Data Availability: *The data used in this study are available from the sources identified in the study.*

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I. INTRODUCTION

Understanding the properties of accruals is arguably one of the most important goals of financial accounting research. The primary objective of financial accounting is to provide information that is useful to investors. Accrual accounting has emerged as the accepted method of achieving this objective. Accrual accounting centers on the identification and measurement of assets and liabilities, with accruals representing changes in noncash assets and liabilities. A natural goal for financial accounting research is to investigate how accruals facilitate investor decision making. In an attempt to address this question, Dechow (1994) provides evidence that accrual accounting earnings are superior to cash accounting earnings at summarizing firm performance. In follow-up research, Sloan (1996) shows that the accrual component of earnings is less persistent than the cash component of earnings. Sloan's (1996) results suggest that while accrual accounting is superior to cash accounting, the accrual component of earnings should receive a lower weighting than the cash component of earnings in evaluating firm performance. He attributes this result to the greater subjectivity involved in the estimation of accruals. Sloan (1996) also finds that investors do not appear to assign a lower weighting to accruals, leading to significant security mispricing. He concludes that investors do not fully comprehend the greater subjectivity involved in the estimation of accruals, causing them to make flawed investment decisions.

Subsequent research extends Sloan's (1996) work on the lower persistence of the accrual component of earnings. This research can be classified into two broad streams. The first stream of research builds on Sloan's (1996) conjecture that the lower persistence of the accrual component of earnings arises because the estimation of accruals involves greater subjectivity. For example, Xie (2001) shows that the lower persistence of the accrual component of earnings is attributable to the "abnormal" component of accruals, defined using the modified Jones (1991) model of normal accruals. He concludes that the lower persistence of accruals is primarily attributable to opportunistic managerial discretion. Dechow and Dichev (2002) and Richardson et al. (2005) (hereafter, RSST) show that the lower persistence of accruals is consistent with the existence of estimation error in accruals. These papers conclude that the lower persistence of the accrual component of earnings is attributable to temporary accounting distortions arising from accrual estimation error. Note that such distortions could arise both from unintentional errors in forecasting future benefits and obligations and from intentional managerial manipulation.

The second stream of research argues that accruals are correlated with economic characteristics, such as firm growth, and that these correlated economic characteristics are responsible for the lower persistence of the accrual component of earnings. In particular, Fairfield et al. (2003a) (hereafter, FWY) show that the lower persistence of the accrual component of earnings extends from the working capital accruals considered by Sloan (1996) to growth in noncurrent balance sheet accounts. They suggest that the lower persistence of the accrual component of earnings arises from the interaction of firm growth with the lower rates of economic profits associated with diminishing marginal returns to increased investment. Variants of this explanation are embraced by Titman et al. (2004), Anderson and Garcia-Feijoo (2006), and Cooper et al. (2005). FWY also propose that the lower persistence of the accrual component of earnings may result from the interaction of firm growth with the conservative bias in generally acceptable accounting principles.

The objective of this paper is to provide additional evidence on the role of accounting distortions in explaining the lower persistence of the accrual component of earnings. We begin with a series of numerical examples that illustrate the impact of accounting distortions on accruals and earnings. The key insight emerging from these examples is that the observed empirical relation between accruals and earnings persistence is consistent with the existence of temporary accounting distortions arising from accrual estimation error. Next, we provide two sets of empirical tests examining the role of temporary accounting distortions. First, we decompose accruals into a "growth" component and an "efficiency" component. The growth component reflects accruals that are attributable to growth in output, while the efficiency component reflects accruals that are unrelated to growth in output. The effects of diminishing marginal returns to increased investment should be captured by the growth component of accruals. Our results indicate that both the growth and efficiency components contribute to the lower persistence of earnings. These results indicate that diminishing marginal returns do not provide a complete explanation for the lower persistence of the accruals, suggesting that accounting distortions play a significant role.

Our second set of tests examines the association between accruals and SEC enforcement actions for alleged earnings manipulations. We show that firms subject to SEC enforcement actions have abnormally high accruals at the time of the alleged earnings manipulations and unusually low accruals following the alleged earnings manipulations. These results are consistent with the opportunistic use of managerial discretion to generate accounting distortions that temporarily inflate accruals and earnings.

Overall, our analysis and results suggest that temporary accounting distortions provide the most compelling explanation for the lower persistence of the accrual component of earnings. Moreover, our SEC enforcement action tests suggest that some of these distortions arise from the opportunistic use of managerial discretion. At the same time, we cannot rule out a supplementary role for growth-related explanations, such as diminishing marginal returns to new investment.

Our findings have important implications for financial accounting, because they indicate that the lower persistence of accruals is at least partially attributable to distortions arising from accrual accounting. Accrual accounting involves a trade-off between the increased relevance associated with accruing future benefits and obligations and the reduced reliability associated with estimating the amounts of these future benefits and obligations. Our results suggest that the reduced reliability associated with accrual accounting results in temporary accounting distortions that have a significant impact on earnings persistence. The current push by accounting standard setters toward "fair value" accounting is likely to increase the frequency and magnitude of accounting distortions, leading to a reduction in the persistence and reliability of earnings.

The remainder of the paper is organized as follows. Section II provides a more detailed discussion of accruals and their implications for earnings persistence. Section III develops numerical examples that illustrate the effects of accounting distortions on the properties of accruals and earnings. Section IV describes our data, Section V presents our results, and Section VI concludes.

II. RESEARCH DESIGN

Alternative Explanations for the Lower Persistence of the Accrual Component of Earnings

Our objective in this paper is to discriminate between alternative explanations for the lower persistence of the accrual component of accounting earnings (where earnings are deflated by an appropriate measure of invested capital and thus expressed as an accounting rate of return). Formally, this result states that $\gamma_2 < 0$ in the following equation:

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 ACC_t + \upsilon_{t+1} \tag{1}$$

where:

$RNOA_{t+1}$ = accounting rate of return for period $t+1$;
$RNOA_t$ = accounting rate of return for period t;
ACC_t = accrual component of the accounting rate of return for period t; and
υ_{t+1} = period $t+1$ innovation in $RNOA_{t+1}$ (assumed to be mean zero and uncorrelated with $RNOA_t$ and ACC_t).

From an intuitive perspective, this result manifests itself in the form of the following empirical regularity:

Empirical Regularity: Firms with high (low) accruals in the current period tend to have a high (low) accounting rate of return in the current period, but tend to experience significant reductions (increases) in their accounting rate of return in the subsequent period.

Panels A and B of Figure 1 illustrate this empirical regularity using our sample and variable definitions (we detail our sample formation and variable definitions later in the paper). This figure reports event-time plots for firm-years belonging to extreme accrual deciles in event-year 0. Panel A of Figure 1 plots the mean value of the accrual component of earnings for each of the extreme accrual deciles. This plot illustrates that the accrual component of earnings is rapidly mean reverting. Panel B of Figure 1 plots the mean value of the accounting rate of return for the extreme accrual deciles. This plot illustrates that firms in the high (low) accrual decile tend to have a high (low) accounting rate of return in event period 0, but tend to experience significant reductions (increases) in their accounting rate of return in the subsequent period. This is the regularity that we seek to explain in this paper. This regularity has proven to be robust across a variety of samples and variable definitions (see Sloan 1996; FWY; RSST).

Existing research offers two broad classes of explanations for the lower persistence of the accrual component of earnings. Following Sloan (1996), one line of research argues that it results from accounting distortions associated with the lower reliability of the accrual component of earnings. Following FWY, a second line of research argues that it is more likely to result from economic factors associated with growth in real investment and less likely to result from accounting distortions. The primary goal of our paper is to provide additional evidence that accounting distortions are a significant contributing factor to this empirical regularity.

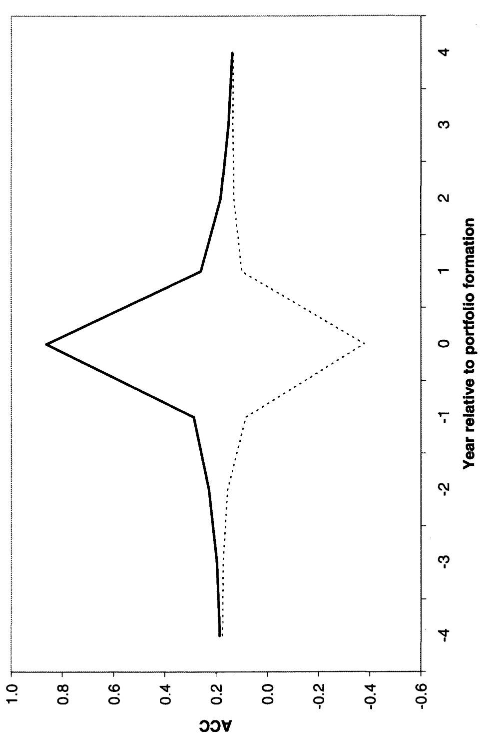
Existing evidence relating to alternative explanations is indirect and inconclusive. Papers claiming to provide evidence in support of the accounting distortion explanation include Xie (2001), Dechow and Dichev (2002), and RSST. Xie decomposes accruals into "normal" and "abnormal" accruals using the modified Jones model (see Dechow et al. 1995). He finds that the lower persistence of earnings is primarily attributable to abnormal accruals. Based on this evidence, he concludes that the lower persistence of accruals is attributable to accounting distortions arising from earnings management. Dechow and Dichev (2002) attempt to isolate temporary accounting distortions by extracting the residuals from regressions of accruals on past, present, and future cash flows. They demonstrate that the lower persistence of the accrual component of earnings is concentrated in these residuals. RSST decompose accruals along broad balance sheet classifications and rank

FIGURE 1

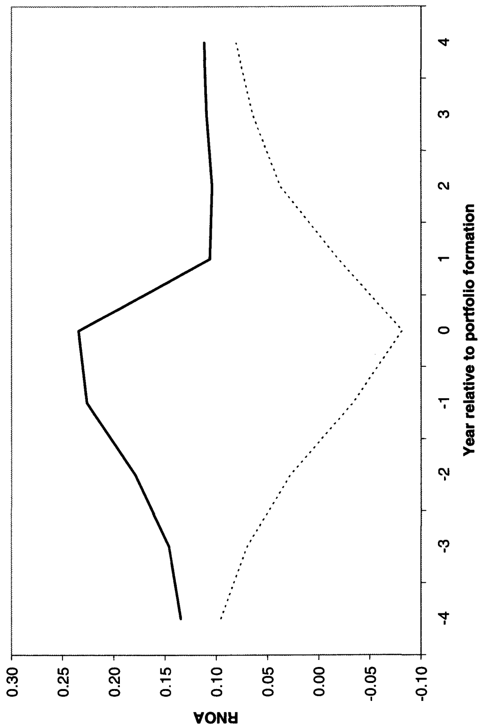
Event-Time Plots of the Mean Values of Accruals (*ACC*), Accounting Rate of Return (*RNOA*), Sales Growth (*SG*), and Change in Asset Turnover (Δ*AT*) for Extreme Accrual (*ACC*) Deciles

Year 0 Represents the Accrual Ranking Year. The solid (dashed) line represents the highest (lowest) accrual decile.

Panel A: Accruals (*ACC*)

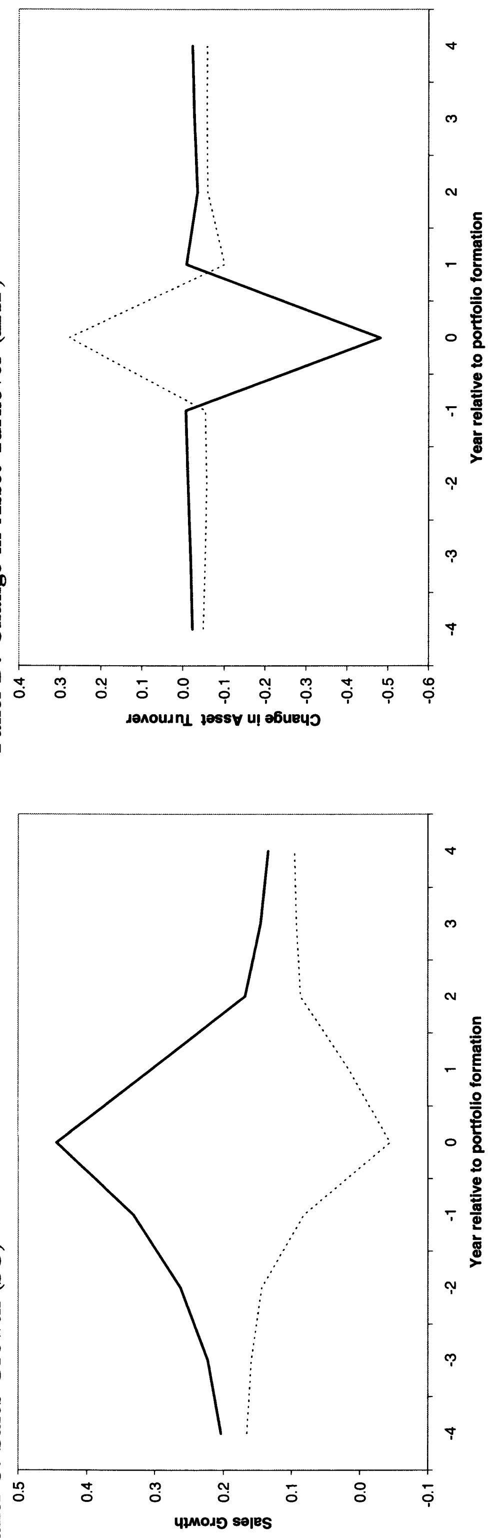


Panel B: Accounting Rates of Return (*RNOA*)



(continued on next page)

FIGURE 1 (continued)



Panel C: Sales Growth (*SG*)

Panel D: Change in Asset Turnover (*ΔAT*) these classifications based on their assessment of the reliability of the underlying accrual categories. They show that the lower persistence of the accrual component of earnings is primarily attributable to accrual categories that they deem to be less reliable.

Papers proposing economic explanations for the lower persistence of the accrual component of earnings include FWY, Cooper et al. (2005), and Khan (2005). FWY show that the lower persistence of the accrual component of earnings extends from the working capital accruals considered by Sloan (1996) to growth in noncurrent operating assets. They suggest that the lower persistence of the accrual component of earnings arises from the interaction of investment growth with the lower rates of return from diminishing marginal returns to increased investment. In follow up research, Cooper et al. (2005) show that FWY's results extend to the growth rate in total assets. Following FWY, they also conclude that diminishing marginal returns to new investment is the most likely explanation. Finally, recent research by Khan (2005) and Zach (2005) argues that accruals proxy for risk. Khan (2005) argues that firms with high accruals better enable investors to smooth intertemporal consumption patterns, while firms with low accruals expose investors to distress risk. Accordingly, firms with high (low) accruals earn lower (higher) equilibrium profits and stock returns.

FWY also propose another possible explanation that combines both accounting distortions and economic growth. They argue that the widespread use of conservative accounting methods combines with growth in real investment to cause the lower persistence of the accrual component of earnings. We refer to this type of accounting distortion as a permanent accounting distortion, because it results from the consistent application of biased accounting methods. An example of such an accounting method would be the requirement to immediately and consistently expense research and development costs. Such permanent accounting distortions are subtly different from the previously discussed temporary accounting distortions. Temporary accounting distortions arise from transitory estimation error in accruals. Accruals represent estimates of future benefits and obligations. As such, they are more prone to estimation error than actual cash receipts or disbursements. An example of accrual estimation error would be the accrual of the allowance for uncollectible accounts on credit sales. A range of possible amounts could be feasibly booked, but only one of these amounts will reflect subsequent uncollectibles. All other amounts will contain transitory estimation error that is reversed once actual collections are known. We refer to this type of error as a temporary accounting distortion, because it results from transitory estimation error rather than the consistent application of biased accounting methods.

In order to provide evidence on the role of accounting distortions, our research design employs three complementary approaches. First, to illustrate the effects of accounting distortions on accruals and profitability, we develop a series of numerical examples. These examples assume constant marginal returns to investment, and so help us to isolate the impact of accounting distortions on accruals and profitability. They also allow us to determine which combinations of accounting distortions and growth are consistent with empirical regularities in accruals and profitability. Second, to discriminate between accounting distortions and diminishing marginal returns to new investment, we decompose accruals into a component attributable to growth in real investment ("growth component") and a component attributable to changes in the efficiency with which existing investments are employed ("efficiency component"). The effects of diminishing marginal returns should be limited to the growth component. Thus, to the extent that the efficiency component drives the observed properties of accruals, we infer that accounting distortions explain these properties. Third, to investigate the possibility that temporary accounting distortions are generated by managerial manipulation, we examine the relation between accruals and SEC enforcement actions for alleged earnings manipulations. The SEC issues an enforcement action in cases where it believes management has intentionally manipulated earnings in a manner that violates GAAP. Hence, evidence of a relation between SEC enforcement actions and accruals is consistent with temporary accounting distortions resulting from managerial manipulation.

Defining Accruals

Following Healy (1985), most academic research defines accruals as the change in noncash working capital less depreciation expense (e.g., Sloan 1996; Xie 2001; Thomas and Zhang 2001; FWY). This definition, however, omits accruals relating to noncurrent operating assets/liabilities and financial assets/liabilities. RSST propose a broader definition of accruals that incorporates all differences between GAAP earnings and cash earnings. They argue that in the absence of accrual accounting, only cash and owner's equity would appear on the balance sheet, because all other accounts are manifestations of the accrual accounting process. Under their definition, changes in all noncash asset and liability accounts represent accruals of expected future benefits or obligations. Total accruals therefore include working capital accruals (related to changes in noncash current operating asset/liability accounts), noncurrent operating accruals (related to changes in noncurrent operating asset/liability accounts), and financing accruals (related to changes in noncash financial asset/liability accounts).

RSST's expanded definition of accruals contrasts sharply with the definition of accruals used by FWY. FWY follow the established convention of referring only to working capital accruals as "accruals," and label noncurrent operating accruals as a generic form of "growth." FWY show that the change in net operating assets, which combines working capital accruals and noncurrent operating accruals, best captures the low-persistence component of earnings. They offer this result as their primary evidence against accounting-based explanations. The key difference, however, between working capital accruals and noncurrent operating accruals is that the future benefits and obligations associated with the latter usually take longer to be realized. Both are manifestations of the accrual accounting process, involving subjective estimates of future benefits and obligations. Moreover, as illustrated by the accounting debacle at WorldCom, noncurrent accruals are susceptible to earnings manipulation.[1] Thus, FWY's evidence does not help discriminate between accounting and economic-based explanations, because it is consistent with both.

RSST argue that both working capital accruals and noncurrent operating accruals are of low reliability and, hence, particularly prone to temporary accounting distortions. Consistent with these arguments, they show that the working capital and noncurrent operating accrual components of earnings are less persistent than the cash flow and financing accrual components of earnings. Thus, RSST reinterpret FWY's growth in net operating asset variable as a more comprehensive measure of accruals and FWY's results as a manifestation of temporary accounting distortions in accruals. Following RSST, we incorporate noncurrent operating assets into our definition of accruals, and we refer to the sum of working capital accruals and noncurrent operating accruals as total operating accruals. Thus, our definition of accruals includes all operating accruals, but excludes the more reliable financing accruals.

[1] WorldCom overstated its net income by more than $10 billion between 2000 and 2001, primarily by capitalizing line-operating costs in property, plant, and equipment. Dechow and Schrand (2004) and Nelson et al. (2003) also document evidence of earnings management through the inappropriate capitalization of operating costs. Surveys of earnings restatements by Huron Consulting Group also indicate that inappropriate capitalization of costs has been a major reason for restatements in recent years.

For expositional ease, we simply refer to this construct as the accrual component of earnings (denoted *ACC*) throughout the remainder of the paper. Note that given this definition of accruals, the corresponding definition of cash flows (i.e., the difference between earnings and accruals) is the standard finance textbook definition of free cash flow.[2] Exact variable definitions in terms of Compustat items are provided in Section IV.

Growth versus Efficiency Decomposition

FWY argue that diminishing marginal returns to new investment contribute to the lower persistence of the accrual component of earnings. In support of this argument, they provide a reference to Stigler (1963, 54). In this reference, Stigler asserts that:

> There is no more important proposition in economic theory than that, under competition, the rate of return on investment tends toward equality in all industries. Entrepreneurs will seek to leave relatively unprofitable industries and enter relatively profitable industries, and with competition, there will be neither public nor private barriers to these movements.

Note that FWY measure growth at the firm level while Stigler's (1963) arguments apply at the industry level. FWY's argument therefore requires that firm-level growth has a significant influence on industry-level output. This would only be the case if either the firm produces a significant proportion of industry output, or growth is strongly correlated across firms in the same industry.

In order to investigate the diminishing returns to new investment explanation in more detail, we decompose accruals into a "growth" component and an "efficiency" component. Accruals can increase either because of real investment growth (whereby more operating assets lead to increased production and sales), or because of reduced efficiency (whereby more operating assets are required to generate the same level of production and sales). Diminishing marginal returns to new investment will be reflected in the growth component of accruals. The efficiency component of accruals, in contrast, will pick up either accounting distortions or less efficient use of existing capital (see also, Jansen and Yohn 2003). For example, assume that inventories increase without corresponding increases in sales or payables. This increase will manifest itself as a decrease in the efficiency component of accruals. The two most likely explanations for such an increase are that inventories are overstated (i.e., a temporary accounting distortion) or that the firm is managing physical inventories less efficiently.

Existing research recognizes that real investment growth necessitates increased operating assets and so will be associated with higher accruals (e.g., Jones 1991). Such accruals are often termed "nondiscretionary" or "normal" in the academic literature. Nondiscretionary (discretionary) accruals are traditionally modeled as the fitted values (residuals) from regressions of accruals on measures of growth in operating activities, such as sales growth.[3] Recent studies by Xie (2001) and Chan et al. (2006) find that the lower persistence of the accrual component of earnings is primarily attributable to the discretionary component of accruals. However, the statistically oriented decompositions used in these studies are subject to misspecification. First, they impose an *ad hoc* linear structure on a nonlinear

[2] Recall that free cash flow equals earnings, plus noncash charges such as depreciation, less changes in working capital, less investment expenditures. These adjustments to earnings correspond to the current and noncurrent operating accruals that we incorporate in our definition in accruals.

[3] See Dechow et al. (1995) for a more detailed discussion of the efficacy of models used for isolating the discretionary and nondiscretionary components of accruals.

relation. Second, they require the estimation of key parameters (e.g., the sensitivity of accruals to sales growth). We use a parsimonious algebraic decomposition of accruals that mitigates these problems.

The starting point for our growth versus efficiency decomposition is our measure of total operating accruals (*ACC*), defined as the change in net operating assets deflated by lagged operating assets. Net operating assets (*NOA*) is defined as the difference between noncash operating assets and operating liabilities. This definition corresponds to FWY's "growth in net operating assets" variable and RSST's "total operating accrual' variable."[4]

$$ACC_t = (NOA_t - NOA_{t-1})/NOA_{t-1}. \tag{2}$$

We next define efficiency using the standard net operating asset turnover ratio (*AT*):

$$AT_t = Sales_t/NOA_t. \tag{3}$$

The following decomposition then follows with some simple algebra:[5]

$$\begin{aligned} ACC_t &= \Delta NOA_t/NOA_{t-1} \\ &= \underbrace{\Delta \mathrm{Sales}_t/Sales_{t-1}}_{\substack{\text{Sales}\\ \text{Growth}}} - \underbrace{\Delta AT_t/AT_t}_{\substack{\text{Change in}\\ \text{Efficiency}}} - \underbrace{(\Delta Sales_t/Sales_{t-1})^*(\Delta AT_t/AT_t)}_{\text{Interaction}}. \end{aligned} \tag{4}$$

Note that this decomposition is an algebraic identity that does not require the estimation of any additional parameters. The decomposition highlights the two determinants of operating accruals. First, accruals are directly related to sales growth. If asset efficiency remains unchanged, then sales growth will lead to proportional increases in accruals. Second, accruals are negatively related to efficiency. In the absence of sales growth, reductions in asset efficiency lead to proportional increases in accruals. The decomposition also contains an interaction term, indicating that a simple linear decomposition is not appropriate when sales growth and efficiency changes are correlated. A nonzero correlation is a distinct possibility. Economies of scale imply a positive correlation between sales growth and change in efficiency. Alternatively, diminishing marginal returns to new investment imply a negative correlation between sales growth and change in efficiency (because increased sales lead to lower sales prices, which lead to lower turnover).

In line with the discussion at the beginning of this section, growth in real investment should be reflected by the growth component of accruals. In contrast, temporary accounting distortions, such as the overstatement of inventory, should be captured by the efficiency component of accruals. Correlated changes in both growth and distortions will be picked up by the interaction. Note that one potential limitation of these tests is that the growth component of accruals could also be affected by accounting distortions in sales (e.g., overstatement of accounts receivable). Thus, we cannot unambiguously attribute the properties of the growth component to diminishing returns. We can, however, rule out the possibility that properties of the efficiency component are attributable to diminishing returns to new

[4] FWY and RSST use average total assets as the deflator. We use lagged net operating assets, as this allows for a parsimonious algebraic decomposition. As a practical matter, however, our empirical results are qualitatively identical if we deflate by either end-of-year *NOA*, average *NOA*, or average total assets.

[5] See the Appendix for the proof.

investment. Thus, evidence of a significant role for the efficiency component of accruals in explaining the lower persistence of earnings is consistent with a significant role for temporary accounting distortions.

III. THE EFFECT OF ACCOUNTING DISTORTIONS

We now turn to our numerical examples in order to better understand the impact of accounting distortions on accruals and profitability. Our examples are adapted from related examples in Penman (2001) modeling the effects of permanent accounting distortions. We extend Penman's (2001) examples to consider both permanent and temporary accounting distortions.[6] Recall that the empirical regularity we seek to explain is the positive association between accruals and contemporaneous profitability and the negative association between accruals and subsequent changes in profitability. FWY refer to Penman's (2001) examples to support their claim that this empirical regularity is consistent with the interaction of permanently conservative accounting and growth.[7]

Our numerical examples are based on a generic investment opportunity generating a constant economic return of 10 percent. In order to give the investment opportunity the characteristics of the business operations of a typical firm, we assume that the investment generates sales revenue and requires operating expenditures. The investment is made (in cash) at the end of the current period and generates sales revenues (in cash) at the end of the next period in the amount of 165 percent of the investment. Operating expenses are also incurred (in cash) at the end of the next period in the amount of 55 percent of the investment. These assumptions generate cash flow at the end of the next period equal to 110 percent of the current period investment, to give the 10 percent economic rate of return. The appropriate accounting to capture the underlying economics of this simple investment opportunity should be clear. The benefits to investment made at the end of period t are all realized at the end of period $t+1$. Hence, all investment in period t should be capitalized at the end of period t and expensed at the end of period $t+1$. Such accounting will always result in accounting rates of return that correspond to the economic rate of return of 10 percent (see subsequent examples for details), and we refer to such accounting as "neutral accounting."

In order to study the effect of accounting distortions on accruals and profitability, we introduce "conservative" and "aggressive" accounting alternatives to the neutral accounting described above. Our conservative accounting method only capitalizes 80 percent of the investment made at the end of each period, despite the fact that all the benefits from the investment are received at the end of the subsequent period. An example of such accounting would be a situation where 20 percent of the investment is determined to represent research and development costs, and hence immediately expensed under GAAP. On the other hand, our aggressive accounting method capitalizes 120 percent of the investment made at the end of each period. This is accomplished by capitalizing some of the cash

[6] We stress that our numerical examples are not intended to provide evidence on the role of diminishing marginal returns to investment in explaining the lower persistence of the accrual component of earnings. Neither Penman (2001) nor FWY use examples to illustrate the impact of diminishing marginal returns to investment. Note that if we construct a model in which we incorporate an assumption of diminishing marginal returns, it is intuitively obvious that returns will diminish, so such a modeling exercise is redundant.

[7] Penman (2001, 561) refers to an example illustrating that growth in real investment interacts with conservative accounting methods to understate profitability in high accrual/investment periods and overstate profitability in subsequent periods. This example is opposite to the empirical regularity that we are trying to explain. Penman (2001, 565) makes the (correct) point that steady-state investment combines with conservative accounting methods to permanently inflate accounting rates of return. This example is also not descriptive of our empirical regularity.

operating costs for that period in addition to the entire investment. An example of such an accounting practice would be the capitalization of maintenance costs that are not expected to generate benefits in subsequent periods. Note that under both the aggressive and conservative accounting methods, we assume that all amounts capitalized in any period are expensed at the end of the subsequent period.[8]

The second dial that we turn in our example is the growth rate in investment. Recall that FWY propose an explanation based on the interaction of real investment growth with permanent accounting distortions. We therefore construct our example to cover seven consecutive periods and we consider how investment growth affects accounting rates of return over these seven periods. We model a positive growth scenario, initially starting with a 0 percent growth rate for two periods, increasing to a 5 percent growth rate for the next period, increasing to 20 percent for one period, then declining to a 5 percent growth rate for one period, followed by a 0 percent growth rate for the final two periods. We select this pattern of growth as it is representative of the sequence of growth rates experienced by a typical "high-growth" firm, with the period of 20 percent growth representing the high growth period (see discussion of Table 3 in Section V). Growth tends to be rapidly mean reverting, so firms with unusually high growth in investment in one period tend to have a declining pattern of growth in surrounding periods (see Nissim and Penman 2001). We also briefly describe the corresponding negative growth scenario that is the mirror image of the positive growth scenario with growth initially starting at 0 percent for two periods, followed by −5 percent for one period, −20 percent for one period, −5 percent for one period, and 0 percent for the final two periods.

Within each of the growth scenarios, we consider five different accounting regimes: the neutral accounting scenario, two aggressive accounting scenarios, and two conservative accounting scenarios. The reason that we have two aggressive and conservative accounting scenarios is that we want to consider the effects of both permanent and temporary accounting distortions. Recall that permanent accounting distortions result from the consistent application of biased accounting methods. These are the types of distortions considered by Penman (2001) and FWY. Temporary accounting distortions, in contrast, result from transitory estimation errors in accruals. These are the types of distortions considered by Dechow and Dichev (2002) and RSST. Our numerical example reports the patterns in profitability (*RNOA*, measured as operating income on lagged operating assets) and the accrual component of profitability (*ACC*, measured as the percentage change in net operating assets) for each of the above scenarios.

Table 1 details our examples. We begin with an initial investment of \$100 and then track the financial performance over the subsequent seven periods. We introduce any temporary accounting distortions in the fourth period, labeling this period as event period 0 and other periods relative to this period. The first row of Panel A simply lists the growth rates in investment. The second row lists the dollar amount of investment in each period that results from sequentially applying these growth rates to the initial investment of 100 in period −4. The third and fourth rows show the amounts of operating costs and investment costs that are capitalized in each period. In the neutral accounting scenario, none of the operating costs are capitalized and 100 percent of the investment costs are capitalized in

[8] We assume the benefits from the investment and associated amortization of capitalized investment are all realized in the subsequent period. These assumptions are clearly arbitrary and are chosen to be a reasonable but not exhaustive representation. The key takeaways from the examples are robust to assuming that the investment benefits and amortization expenses occur over multiple future periods. The only major qualification is that the accounting distortions reverse over more than one future period. This finding is comforting, since the impact of accrual reversals on earnings also takes more than one period in our empirical data (see Figures 1 and 2).

TABLE 1
Numerical Examples Illustrating the Effect of Accounting Distortions on Profitability and Accruals

Numerical examples illustrating the relation between profitability (*RNOA*) and accruals (*ACC*) for firms experiencing a combination of positive growth and accounting distortions. The numerical examples are based on a simple firm making an investment in period *t* that generates sales in period *t*+1. Sales are 165% of the period *t* investment and operating expenses are 55% of the period *t* investment (both incurred in cash in period *t*+1). In the neutral accounting example, 100% of investment is capitalized in period *t* and expensed in period *t*+1. In the permanently (temporarily) conservative accounting case the firm always (in year 0 only) capitalizes 80% of the investment in year *t* and expenses it in *t*+1. In the permanently (temporarily) aggressive accounting case the firm always (in year 0 only) capitalizes 120% of the investment in year *t* and expenses it in *t*+1. *RNOA* is measured as Operating Income divided by lagged *NOA*. Accruals (*ACC*) are defined as the change in *NOA* divided by lagged *NOA*.

	−4	−3	−2	−1	0	1	2	3
Panel A: Neutral Accounting with Positive Growth								
Growth Rate in Investment		0.0%	0.0%	5.0%	20.0%	5.0%	0.0%	0.0%
Investment	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Capitalized Operating Costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capitalized Investment Costs	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Total Capitalized Costs	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Sales	0.00	165.00	165.00	165.00	173.25	207.90	218.30	218.30
Operating Expense	0.00	55.00	55.00	55.00	57.75	69.30	72.77	72.77
Investment Expense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amortization Expense	0.00	100.00	100.00	100.00	105.00	126.00	132.30	132.30
Operating Income	0.00	10.00	10.00	10.00	10.50	12.60	13.23	13.23
Net Operating Assets (NOA)	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
RNOA		**10.0%**	**10.0%**	**10.0%**	**10.0%**	**10.0%**	**10.0%**	**10.0%**
Accruals (ACC)		**0.0%**	**0.0%**	**5.0%**	**20.0%**	**5.0%**	**0.0%**	**0.0%**
Panel B: Permanently Conservative Accounting with Positive Growth								
Growth Rate in Investment		0.0%	0.0%	5.0%	20.0%	5.0%	0.0%	0.0%
Investment	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Capitalized Operating Costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capitalized Investment Costs	80.00	80.00	80.00	84.00	100.80	105.84	105.84	105.84
Total Capitalized Costs	80.00	80.00	80.00	84.00	100.80	105.84	105.84	105.84
Sales	0.00	165.00	165.00	165.00	173.25	207.90	218.30	218.30
Operating Expense	0.00	55.00	55.00	55.00	57.75	69.30	72.77	72.77
Investment Expense	20.00	20.00	20.00	21.00	25.20	26.46	26.46	26.46
Amortization Expense	0.00	80.00	80.00	80.00	84.00	100.80	105.84	105.84
Operating Income	−20.00	10.00	10.00	9.00	6.30	11.34	13.23	13.23
Net Operating Assets (NOA)	80.00	80.00	80.00	84.00	100.80	105.84	105.84	105.84
RNOA		**12.5%**	**12.5%**	**11.3%**	**7.5%**	**11.3%**	**12.5%**	**12.5%**
Accruals (ACC)		**0.0%**	**0.0%**	**5.0%**	**20.0%**	**5.0%**	**0.0%**	**0.0%**

(*continued on next page*)

TABLE 1 (Continued)

	−4	−3	−2	−1	0	1	2	3
Panel C: Permanently Aggressive Accounting with Positive Growth								
Growth Rate in Investment		0.0%	0.0%	5.0%	20.0%	5.0%	0.0%	0.0%
Investment	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Capitalized Operating Costs	20.00	20.00	20.00	21.00	25.20	26.46	26.46	26.46
Capitalized Investment Costs	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Total Capitalized Costs	120.00	120.00	120.00	126.00	151.20	158.76	158.76	158.76
Sales	0.00	165.00	165.00	165.00	173.25	207.90	218.30	218.30
Operating Expense	−20.00	35.00	35.00	34.00	32.55	42.84	46.31	46.31
Investment Expense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amortization Expense	0.00	120.00	120.00	120.00	126.00	151.20	158.76	158.76
Operating Income	20.00	10.00	10.00	11.00	14.70	13.86	13.23	13.23
Net Operating Assets (NOA)	120.00	120.00	120.00	126.00	151.20	158.76	158.76	158.76
RNOA		**8.3%**	**8.3%**	**9.2%**	**11.7%**	**9.2%**	**8.3%**	**8.3%**
Accruals (ACC)		**0.0%**	**0.0%**	**5.0%**	**20.0%**	**5.0%**	**0.0%**	**0.0%**
Panel D: Temporarily Conservative Accounting with Positive Growth								
Growth Rate in Investment		0.0%	0.0%	5.0%	20.0%	5.0%	0.0%	0.0%
Investment	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Capitalized Operating Costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capitalized Investment Costs	100.00	100.00	100.00	105.00	100.80	132.30	132.30	132.30
Total Capitalized Costs	100.00	100.00	100.00	105.00	100.80	132.30	132.30	132.30
Sales	0.00	165.00	165.00	165.00	173.25	207.90	218.30	218.30
Operating Expense	0.00	55.00	55.00	55.00	57.75	69.30	72.77	72.77
Investment Expense	0.00	0.00	0.00	0.00	25.20	0.00	0.00	0.00
Amortization Expense	0.00	100.00	100.00	100.00	105.00	100.80	132.30	132.30
Operating Income	0.00	10.00	10.00	10.00	−14.70	37.80	13.23	13.23
Net Operating Assets (NOA)	100.00	100.00	100.00	105.00	100.80	132.30	132.30	132.30
RNOA		**10.0%**	**10.0%**	**10.0%**	**−14.0%**	**37.5%**	**10.0%**	**10.0%**
Accruals (ACC)		**0.0%**	**0.0%**	**5.0%**	**−4.0%**	**31.3%**	**0.0%**	**0.0%**
Panel E: Temporarily Aggressive Accounting with Positive Growth								
Growth Rate in Investment		0.0%	0.0%	5.0%	20.0%	5.0%	0.0%	0.0%
Investment	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Capitalized Operating Costs	0.00	0.00	0.00	0.00	25.20	0.00	0.00	0.00
Capitalized Investment Costs	100.00	100.00	100.00	105.00	126.00	132.30	132.30	132.30
Total Capitalized Costs	100.00	100.00	100.00	105.00	151.20	132.30	132.30	132.30
Sales	0.00	165.00	165.00	165.00	173.25	207.90	218.30	218.30
Operating Expense	0.00	55.00	55.00	55.00	32.55	69.30	72.77	72.77
Investment Expense	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amortization Expense	0.00	100.00	100.00	100.00	105.00	151.20	132.30	132.30
Operating Income	0.00	10.00	10.00	10.00	35.70	−12.60	13.23	13.23
Net Operating Assets (NOA)	100.00	100.00	100.00	105.00	151.20	132.30	132.30	132.30
RNOA		**10.0%**	**10.0%**	**10.0%**	**34.0%**	**-8.3%**	**10.0%**	**10.0%**
Accruals (ACC)		**0.0%**	**0.0%**	**5.0%**	**44.0%**	**−12.5%**	**0.0%**	**0.0%**

each period. The next five rows present the periodic income statements. Sales in each period are equal to 165 percent of the prior period investment and operating expenses are equal to 55 percent of the prior period investment. Investment expense is zero (because 100 percent of investment costs are capitalized) and amortization expense is equal to 100 percent of the prior period investment. Operating income is derived by subtracting expenses from sales. The next row represents the net operating assets at the end of the period and is simply equal to the amount of costs that have been capitalized for that period (remember that all capitalized costs are assumed to be expensed at the end of the subsequent period, so we do not have to consider operating assets from previous periods). The final two rows report the resultant trends in profitability (*RNOA*, measured as operating income on lagged operating assets) and accruals (*ACC*, measured as the percentage change in net operating assets).

Panel A of Table 1 reports the neutral accounting scenario. *RNOA* is constant and equal to the economic rate of return of 10 percent for all periods. This base case illustrates that in the absence of accounting distortions, the accounting rate of return simply equals the economic rate of return. Note also that in this base case scenario, *ACC* is synonymous with the growth rate in real investment.

Panel B of Table 1 introduces permanently conservative accounting into the mix. This example gives us our first look at how growth in investment and accounting distortions interact to produce changes in accounting rates of return. It shows that combining permanently conservative accounting with growth in investment causes the accounting rate of return to deviate from the economic rate of return of 10 percent. With the exception of year 0, the *RNOA* is always higher than the economic rate of return of 10 percent. In year 0, however, the *RNOA* is only 7.5 percent. To understand why this happens, note that conservative accounting can affect both the numerator (i.e., operating income) and the denominator (i.e., net operating assets) of the *RNOA* computation. The denominator effect is to always understate investment, leading to an upward bias in reported *RNOA*. The numerator effect depends on investment growth. With zero growth in investment, there is no net effect on the numerator. This is because the impact of the origination of new conservative accounting exactly offsets the impact of the reversal of old conservative accounting. With positive growth in investment, the numerator is depressed relative to the neutral accounting scenario. This is because the origination of new conservative accounting depresses income by more than the reversal of old conservative accounting boosts income. If the growth rate is greater than the economic rate of return, then the numerator effect will dominate the denominator effect, causing *RNOA* to drop below the economic rate of return (i.e., period 0 of Panel B). Similar effects are illustrated by the examples in Penman (2001, 567 and 571). Finally, note that as in the previous example, *ACC* continues to be synonymous with the growth rate in real investment. This is because permanently conservative accounting understates net operating assets by the same percentage in each period, so the growth rate in net operating assets is not affected.

FWY hypothesize that the lower persistence of the accrual component of earnings is consistent with a combination of growth in investment and conservative accounting methods. However, the patterns in accruals and profitability in Panel B of Table 1 are clearly inconsistent with the empirical regularity described in Section II (i.e., periods with high accruals having high contemporaneous *RNOA*, and lower subsequent *RNOA*). Instead, we see that the increase in accruals in period 0 is associated with low contemporaneous *RNOA* and higher subsequent *RNOA*.

Panel C of Table 1 considers a combination of permanently aggressive accounting with positive growth. Recall from Panel B of Table 1 that permanently conservative accounting combines with positive growth to reduce *RNOA*. For analogous reasons, permanently aggressive accounting combines with positive growth to increase *RNOA*. This happens because the origination of new aggressive accounting increases income by more than the reversal of old aggressive accounting reduces income. This causes both accruals and *RNOA* to be overstated in year 0 and drop back down in year 1. These patterns are consistent with the empirical regularity we are trying to explain. High accruals are associated with high contemporaneous *RNOA* and lower subsequent *RNOA*. Thus, in contrast to the arguments in FWY, permanently aggressive accounting and growth combine to explain the regularity, but permanently conservative accounting and growth do not.

Panel D of Table 1 considers a combination of positive investment growth and temporarily conservative accounting. Neutral accounting is applied for event years −4 through −1, conservative accounting is applied in year 0, and neutral accounting is again applied in years 1 through 3. The application of conservative accounting in year 0 has implications for both year 0 and year 1. Conservative accounting in year 0 deflates year 0 *RNOA* to −14 percent. The conservative accounting also causes accruals to temporarily understate real investment, causing *ACC* to fall to −4 percent. Year 1 sees the reversal of the conservative accounting from period 0, causing income to be overstated. Conservative accounting also causes net operating assets at the beginning of period 1 (i.e., the end of period 0) to be understated. These two effects combine to inflate period 1 *RNOA* to 37.5 percent. *ACC* is also overstated in year 1, because net operating assets are understated at the end of period 0.

The patterns observed in Panel D of Table 1 are broadly consistent with the empirical regularity described in Section II. Temporarily conservative accounting causes low accruals and low contemporaneous *RNOA*, followed by increased accruals and *RNOA* in the subsequent period. Note that the growth rate in investment is not critical to achieving this result. Regardless of the growth rate in investment, temporarily conservative accounting will depress current period *RNOA* and *ACC* and inflate subsequent period *RNOA* and *ACC*. A representative real-world example of such an accounting distortion would be the write-down of inventory or PP&E. Write-downs depress current period profitability and accruals, but inflate future period profitability and accruals.

Finally, Panel E of Table 1 considers the combination of temporarily aggressive accounting with positive growth in investment. This panel represents the flip side of the temporarily conservative accounting in Panel D. Temporarily aggressive accounting causes high accruals and contemporaneous *RNOA*, followed by lower accruals and *RNOA* in the subsequent period. These patterns are also consistent with the empirical regularity described in Section II. Note again that the growth rate in real investment is not required to achieve this result. Even in the absence of growth, temporarily aggressive accounting will inflate current period *RNOA* and *ACC* and deflate subsequent period *RNOA* and *ACC*.

There are three key takeaways from Table 1. First, in contrast to the arguments in FWY, the numerical examples indicate that the interaction of growth in real investment and permanently conservative accounting is inconsistent with the empirical regularity we are trying to explain. In fact, permanently conservative accounting causes patterns in accruals and *RNOA* that are exactly opposite to those observed empirically. Second, consistent with Dechow and Dichev (2002) and RSST, the examples indicate that the empirical results are consistent with temporary accounting distortions. Note that temporary accounting distortions achieve this result even in the absence of growth in real investment. Finally, the examples also indicate that the empirical results are consistent with a combination of growth in real investment and permanently aggressive accounting.[9] Note, however, that our examples ignore the possibility of alternative explanations, such as diminishing marginal returns to investment. The examples also do not help us to discriminate between the competing explanations based on temporary accounting distortions versus growth combined with permanently aggressive accounting distortions. To address these issues, we turn next to our empirical tests.

IV. DATA

Our empirical tests employ data from two sources. Financial statement data are obtained from the Compustat Industrial annual database. Information relating to SEC enforcement actions is found using the Lexis-Nexis Academic Universe product. Our sample period covers all firm years with available data on Compustat for the period 1962–2001. We also exclude all firm-year observations with SIC codes in the range 6000–6999 (financial companies). We eliminate firm-year observations with insufficient data on Compustat to compute the primary financial statement variables used in our tests.[10] These criteria yield a final sample size with non-missing financial statement and returns data of 106,423 firm-year observations. Finally, we identify firm-years that were subject to enforcement actions for alleged GAAP violations associated with earnings overstatements by reading SEC enforcement actions reported on Lexis-Nexis over our sample period. SEC enforcement actions are only available from 1979 onward, so we limit ourselves to this period for the SEC enforcement action tests, reducing this sample to 76,165 firm-year observations. Of this sample, 169 firm-years are subject to SEC enforcement actions for alleged earnings overstatements.

We calculate our measure of accruals (*ACC*) as $(NOA_t - NOA_{t-1})/NOA_{t-1}$. *NOA* is the difference between operating assets (*OA*) and operating liabilities (*OL*). *OA* is equal to the sum of current operating assets (*COA*) and noncurrent operating assets (*NCOA*) and *OL* is equal to the sum of current operating liabilities (*COL*) and noncurrent liabilities (*NCOL*). These accrual components are calculated as follows:

COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1).

NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32).

COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34).

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9 In unreported numerical examples we also investigate the interaction of accounting distortions with negative growth in real investment. There are two takeaways. First, temporarily conservative and aggressive accounting continue to explain the empirical regularity in Sloan (1996) and FWY. Second, permanently aggressive accounting interacts with negative growth to explain the empirical regularity. In other words, permanently aggressive accounting interacts with negative growth to temporarily depress accruals and profitability.

10 Specifically, we require availability of Compustat data items 1, 4, 5, 6, 12, and 181 in both the current and previous year and data item 178 in the current year in order to keep a firm-year observation in the sample. If data items 9, 32 or 34 are missing, then we set them equal to zero rather than eliminating the observation. These data items represent balance sheet items that may not be relevant for some companies (e.g., investments and advances), so we set them to zero rather than needlessly discarding observations. All results are qualitatively similar if we instead estimate each regression using only observations with all data available for that particular regression.

$NCOL$ = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9).

Recall that the decomposition in Equation (4) calls for deflation by lagged NOA.[11] We exclude firm-year observations with negative values of this deflator variable from our analysis. Following previous research, all financial statement ratios are winsorized at $+/-1$ respectively to mitigate the influence of outliers. *RNOA* is calculated as operating income after depreciation (Compustat Item #178) deflated by lagged net operating assets.[12] For our analysis of the persistence in the various components of earnings, we use this same definition of earnings. For our growth versus efficiency decomposition, we compute sales growth (*SG*) as the change in sales (Compustat item #12) scaled by lagged sales and we compute change in asset turnover (ΔAT) as shown in Equation (4).

V. RESULTS

We present our results in three subsections. We begin by presenting descriptive statistics for accruals and related financial variables. These descriptive statistics allow us to examine the correspondence between the empirical properties of accruals and profitability and the properties generated in our examples. We next present tests examining the relation of the growth and efficiency components of accruals with respect to future operating profitability. Finally, we examine the relation between accruals and SEC enforcement actions for alleged overstatements of earnings.

Descriptive Statistics

Panel A of Table 2 provides descriptive statistics for accruals (*ACC*) and related financial variables. The mean and median values for *ACC* are both positive, indicating that the typical firm's operating assets have grown over the sample period. The standard deviations of *SG* and ΔAT are both around 0.3, indicating that they are both important sources of variation in *ACC*. Finally, both the mean and median values of *RNOA* are around 15 percent.[13]

Panel B of Table 2 reports pair-wise correlations for the financial variables. *SG* and ΔAT are strongly positively correlated, indicating that growing firms tend to experience increases in asset turnover, which is consistent with economies of scale. The positive correlation between these two components is indicative of a potentially important role for the interaction component of the sales and efficiency decomposition that we derived in Equation

[11] Fairfield et al. (2003b) argue that the lower persistence of accruals relative to cash flows is primarily attributable to growth in the investment base that is not matched by growth in income. In other words, firms with high operating accruals are firms that are growing their operating investments, but earn a lower average return on their increased operating investments, leading to lower persistence in earnings performance. To investigate the importance of this issue for our results, we replicated all of the results in Table 3 using the Fairfield et al. (2003b) approach of measuring our dependent variable with the same deflator as our independent variables. Our results are robust with respect to this procedure. For example, all accrual components continue to have a significantly negative coefficient.

[12] Note that we use a measure of operating income in our analysis of earnings persistence as it is unaffected by nonrecurring components of net income that are reported further down on the income statement. This increases the overall power of our persistence regressions. However, inferences regarding the relative persistence of the different components of earnings are qualitatively similar if we instead use bottom line net income (Compustat item 172).

[13] This is higher than the *RNOA* reported in Nissim and Penman (2001) of 10 percent, but they compute after-tax *RNOA* in their analysis.

TABLE 2
Descriptive Statistics for Total Operating Accruals and Related Financial Variables
(the sample covers 106,423 firm-year observations for the period 1962–2001)

Panel A: Univariate Statistics

	Mean	Std. Dev.	25%	Median	75%
ACC	0.164	0.342	−0.023	0.092	0.280
SG	0.159	0.295	0.009	0.111	0.252
ΔAT	−0.036	0.316	−0.134	0.006	0.121
RNOA	0.149	0.338	0.056	0.154	0.279

Panel B: Correlation Matrix—Pearson (above diagonal) and Spearman (below diagonal) (p-values shown below correlations)

	ACC_t	SG_t	ΔAT_t	$RNOA_t$	$RNOA_{t+1}$	$SECAction_t$
ACC_t	—	0.4932 (0.0001)	−0.6206 (0.0001)	0.2034 (0.0001)	0.0315 (0.0001)	0.0250 (0.0001)
SG_t	0.4763 (0.0001)	—	0.2717 (0.0001)	0.1643 (0.0001)	0.0780 (0.0001)	0.0227 (0.0001)
ΔAT_t	−0.5825 (0.0001)	0.2820 (0.0001)	—	−0.0420 (0.0001)	0.0745 (0.0001)	−0.0118 (0.0001)
$RNOA_t$	0.3450 (0.0001)	0.3406 (0.0001)	−0.0878 (0.0001)	—	0.7541 (0.0001)	0.0040 (0.1966)
$RNOA_{t+1}$	0.1015 (0.0001)	0.2039 (0.0001)	0.0685 (0.0001)	0.7357 (0.0001)	—	−0.0175 (0.0001)
$SECAction_t$	0.0224 (0.0001)	0.0188 (0.0001)	−0.0121 (0.0001)	0.0040 (0.1970)	−0.0181 (0.0001)	—

ACC = total operating accruals defined as the change in Net Operating Assets (*NOA*). It is calculated as $[(NOA_t - NOA_{t-1})/NOA_{t-1}]$;
NOA = Operating Assets (*OA*) − Operating Liabilities (*OL*);
OA = the sum of Current Operating Assets (*COA*) and Noncurrent Operating Assets (*NCOA*);
OL = the sum of Current Operating Liabilities (*COL*) and Noncurrent Operating Liabilities (*NCOL*);
COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1);
NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32);
COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34);
NCOL = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9);
SG = sales growth calculated as $[(Sales_t/Sales_{t-1}) - 1]$, where sales is Compustat Item #12;

$$\Delta AT = \left[\left(\frac{Sales_t}{NOA_t}\right) - \left(\frac{Sales_{t-1}}{NOA_{t-1}}\right)\right] \bigg/ \frac{Sales_t}{NOA_t};$$

RNOA = return on net operating assets for the current year. It is calculated as income from continuing operations (Compustat Item #178) deflated by beginning net operating assets; and
$SECAction_t$ = an indicator variable equal to 1 if the firm-year observation is subject to a SEC Enforcement Action in year *t*, and 0 otherwise.

(4). We also see that *ACC*, *SG*, and ΔAT are all systematically related to SEC enforcement actions. We will explore these relations more fully in our subsequent regression analyses.

Table 3 and Figure 1 report temporal trends in financial performance for firms with extreme accruals. We first rank firms annually on the magnitude of *ACC* and allocate them to decile portfolios in ascending order of *ACC*. We then track the mean (median) *ACC*, *SG*,

TABLE 3
Time-Series Pattern in Total Operating Accruals (*ACC*), Sales Growth (*SG*), Changes in Asset Turnover (Δ*AT*), and Accounting Rates of Return (*RNOA*) for Extreme Accrual Deciles
(the sample consists of 106,423 firm-year observations from 1962–2001)

	Year								
	−4	−3	−2	−1	0	1	2	3	4
Panel A: Low *ACC* Decile									
ACC	0.175	0.173	0.155	0.084	−0.379	0.100	0.130	0.135	0.133
	(0.086)	(0.083)	(0.064)	(0.010)	(−0.330)	(0.024)	(0.063)	(0.068)	(0.067)
SG	0.166	0.159	0.143	0.082	−0.044	0.016	0.087	0.093	0.096
	(0.102)	(0.095)	(0.076)	(0.036)	(−0.051)	(0.011)	(0.061)	(0.067)	(0.069)
Δ*AT*	−0.050	−0.054	−0.058	−0.054	0.276	−0.102	−0.060	−0.059	−0.059
	(0.001)	(0.000)	(−0.002)	(0.010)	(0.286)	(−0.016)	(0.005)	(0.004)	(−0.003)
RNOA	0.095	0.070	0.028	−0.034	−0.082	−0.019	0.037	0.064	0.081
	(0.111)	(0.097)	(0.068)	(0.027)	(−0.008)	(0.054)	(0.094)	(0.110)	(0.117)
Panel B: High *ACC* Decile									
ACC	0.186	0.197	0.228	0.287	0.863	0.259	0.182	0.152	0.138
	(0.109)	(0.116)	(0.147)	(0.234)	(1.000)	(0.188)	(0.118)	(0.095)	(0.084)
SG	0.204	0.223	0.263	0.332	0.444	0.306	0.168	0.145	0.134
	(0.145)	(0.159)	(0.197)	(0.264)	(0.397)	(0.245)	(0.130)	(0.113)	(0.106)
Δ*AT*	−0.023	−0.018	−0.012	−0.007	−0.483	−0.009	−0.035	−0.028	−0.023
	(0.024)	(0.030)	(0.037)	(0.029)	(−0.470)	(0.035)	(0.009)	(0.015)	(0.020)
RNOA	0.135	0.146	0.179	0.226	0.235	0.106	0.104	0.109	0.112
	(0.155)	(0.169)	(0.204)	(0.263)	(0.289)	(0.141)	(0.129)	(0.127)	(0.128)

Mean (median) estimates are reported in the first row (second row in parentheses) for each variable.
We sort firm-year observations into ten equal sized portfolios each year. We then track the mean (median) values of *RNOA*, *SG*, Δ*AT*, and *ACC* for the extreme deciles for four years either side of the ranking year (year 0).

ACC = total operating accruals defined as the change in Net Operating Assets (*NOA*). It is calculated as $[(NOA_t - NOA_{t-1})/NOA_{t-1}]$;
NOA = Operating Assets (*OA*) − Operating Liabilities (*OL*);
OA = the sum of Current Operating Assets (*COA*) and Noncurrent Operating Assets (*NCOA*);
OL = the sum of Current Operating Liabilities (*COL*) and Noncurrent Operating Liabilities (*NCOL*);
COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1);
NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32);
COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34);
NCOL = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9);
SG = sales growth calculated as $[(Sales_t/Sales_{t-1}) - 1]$, where sales is Compustat Item #12;

$$\Delta AT = \left[\left(\frac{Sales_t}{NOA_t}\right) - \left(\frac{Sales_{t-1}}{NOA_{t-1}}\right)\right] \Big/ \frac{Sales_t}{NOA_t}; \text{ and}$$

RNOA = return on net operating assets for the current year. It is calculated as income from continuing operations (Compustat Item #178) deflated by beginning net operating assets.

Δ*AT*, and *RNOA* for the extreme low-*ACC* and high-*ACC* portfolios for the nine-year period centered on the ranking year. Several regularities are immediately obvious. First, accruals are rapidly mean reverting. Second, consistent with FWY and RSST, accounting rates of return track the patterns in accruals. In particular, we see that both the mean and median *RNOA* for the low (high) accrual decile are lowest (highest) in year 0, but then increase (decrease) sharply in year 1. Third, we see that both *SG* and Δ*AT* closely track the patterns in accruals. Note, however, that the rate of mean reversion is much greater for ΔAT than it is for SG. In fact, as is clear from Figure 1, Panel D, ΔAT shows signs of weak negative serial correlation. This pattern is consistent with the predictions of our temporarily conservative accounting distortion examples from Panels D and E of Table 1, whereby *NOA* are temporarily misstated in the year of the distortion.

Overall, these patterns in *RNOA*, *SG*, and ΔAT are consistent with the temporarily conservative and aggressive accounting distortion examples discussed in Section III. The low accrual decile corresponds to temporarily conservative accounting (see Panel D of Table 1) and the high accrual decile corresponds to temporarily aggressive accounting (see Panel E of Table 1). These patterns are also broadly consistent with the interaction of permanently aggressive accounting with growth in real investment. The high accrual decile corresponds to aggressive accounting combined with positive growth (Panel C of Table 1) and the low accrual decile corresponding to aggressive accounting combined with negative growth. In short, these results are consistent with either temporarily aggressive and conservative accounting or the interaction of permanently aggressive accounting with growth. Contradicting the arguments in FWY, these results are inconsistent with the interaction of permanently conservative accounting with growth in real investment (see Panel B of Table 1).

Persistence Results

Table 4 presents our analysis of the persistence of the cash flow and accrual components of earnings. We use the approach adopted in FWY and RSST and previously described in our development of Equation (1). We document the lower persistence of the accrual component of earnings by regressing future *RNOA* on current *RNOA* and *ACC* and testing for a negative coefficient on *ACC*. Using this specification, the coefficient on *ACC* represents the difference between the coefficient on the accrual component of *RNOA* and the coefficient on the cash component of *RNOA* (see FWY; RSST). Specifically, in Panel A of Table 4 we estimate the following regression:

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 ACC_t + \upsilon_{t+1}$$

and hypothesize that $\gamma_2 < 0$.

We report results based on the time-series means and t-statistics of annual cross-sectional regressions (Fama and MacBeth 1973) augmented with the Newey and West (1987) correction for autocorrelation. This approach typically generates a conservative estimate of statistical significance (Loughran and Ritter 2000). Results are qualitatively identical (albeit more statistically significant) using pooled OLS regressions. Consistent with the results in FWY and RSST, we find a statistically negative coefficient on *ACC*. This corroborates the well-known result that the accrual component of earnings is less persistent than the cash flow component of earnings (e.g., Sloan 1996, FWY; RSST).

The regression in Panel B of Table 4 presents the regression results for our growth and efficiency decomposition of ACC:

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + \upsilon_{t+1}. \quad (5)$$

This decomposition allows us to investigate the diminishing marginal returns to investment explanation developed by FWY. Recall from Section II that diminishing marginal returns to investment will manifest itself in the *SG* component of accruals. The regressions indicate that the coefficients on $-\Delta AT$ and *SG* are both significantly negative, with a somewhat

TABLE 4
Time-Series Means and t-Statistics for Coefficients from Annual Cross-Sectional Regressions of Next Year's Accounting Rate of Return on This Year's Accounting Rate of Return and This Year's Total Operating Accruals
(the sample consists of 106,423 firm-year observations from 1962–2001)

Panel A: OLS Regressions for Accruals

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 ACC_t + \upsilon_{t+1}$$

	γ_0	γ_1	γ_2	Adj. R^2
Coefficient	0.029	0.722		0.5506
(t-statistic)	(5.42)	(71.31)		
	0.041	0.764	−0.131	0.5722
	(8.77)	(67.33)	(−14.85)	

Panel B: OLS Regressions for Growth and Efficiency Decomposition of Accruals

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + \upsilon_{t+1}$$

	γ_0	γ_1	γ_2	γ_3	γ_4	Adj. R^2
Coefficient	0.034	0.730	−0.041			0.5527
(t-statistic)	(7.25)	(69.82)	(−7.24)			
	0.310	0.730		−0.117		0.5667
	(6.35)	(72.29)		(−15.99)		
	0.027	0.728			−0.062	0.5537
	(5.32)	(69.85)			(−4.73)	
	0.042	0.756	−0.102	−0.151	−0.007	0.576
	(10.24)	(61.83)	(−13.65)	(−17.06)	(−0.93)	

Reported coefficient estimates and adjusted R^2s are the means from 40 annual cross-sectional regressions. t-statistics are based on the time-series of the annual regression coefficient estimates using the Fama and MacBeth approach augmented by the Newey and West (1987) correction for autocorrelation.

ACC = total operating accruals defined as the change in Net Operating Assets (*NOA*). It is calculated as $[(NOA_t - NOA_{t-1})/NOA_{t-1}]$;
NOA = Operating Assets (*OA*) − Operating Liabilities (*OL*);
OA = the sum of Current Operating Assets (*COA*) and Noncurrent Operating Assets (*NCOA*);
OL = the sum of Current Operating Liabilities (*COL*) and Noncurrent Operating Liabilities (*NCOL*);
COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1);
NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32);
COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34);
NCOL = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9);
SG = sales growth calculated as $[(Sales_t/Sales_{t-1}) - 1]$, where sales is Compustat Item #12;

$$\Delta AT = \left[\left(\frac{Sales_t}{NOA_t}\right) - \left(\frac{Sales_{t-1}}{NOA_{t-1}}\right)\right] \Big/ \frac{Sales_t}{NOA_t};\text{ and}$$

RNOA = return on net operating assets for the current year. It is calculated as income from continuing operations (Compustat Item #178) deflated by beginning net operating assets.

larger and more statistically significant coefficient on $-\Delta AT$.[14] The negative coefficient on $-\Delta AT$ is consistent with accounting distortions providing a significant contribution to the

[14] Unreported tests indicate that the coefficient on $-\Delta AT$ is significantly more negative than the coefficient on *SG* at the 0.01 level.

lower persistence of accruals.[15] Note also that since sales are generally based on accrual accounting estimates (e.g., accounts receivable), the negative coefficient on sales growth may be indicative of either diminishing returns to new investment or accounting distortions in sales. In summary, the evidence from the growth versus efficiency regressions is suggestive of a significant role for accounting distortions in explaining the lower persistence of the accrual component of earnings, though it does not rule out a supplementary role for diminishing returns to new investment.

SEC Enforcement Action Results

Tables 5 and 6 present our final set of tests, investigating the relation between accruals and SEC enforcement actions. The purpose of these tests is to examine the role of managerial discretion in explaining the lower persistence of the accrual component of earnings. Finding a positive contemporaneous relation between accruals and SEC enforcement actions would be consistent with the presence of aggressive distortions in accruals that are attributable to managerial discretion. Note that these tests provide evidence of a special case of the transitory accounting estimation error explanation provided in Dechow and Dichev (2002) and RSST. Specifically, following conjectures by Xie (2001) and Chan et al. (2005), these tests investigate whether the transitory distortions in accruals are attributable to intentional managerial manipulation.

Our dependent variable, *SECAction*, takes the value of 1 for firm-years that the SEC subsequently alleges earnings were overstated in violation of GAAP, and 0 otherwise. Due to the dichotomous nature of the dependent variable, we use logistic regression analysis. The regression in Panel A of Table 5 confirms the existence of a significant positive relation between total operating accruals and the likelihood of an SEC enforcement for overstated earnings (see also, Bradshaw et al. 2001; Dechow et al. 1996).

Panel B of Table 5 employs the RSST decomposition of total operating accruals into working capital accruals and noncurrent operating accruals. Recall that both FWY and RSST show that each of these two accrual components lead to lower earnings persistence. FWY, however, argue that the lower persistence of the noncurrent operating component of accruals is unlikely to be attributable to managerial discretion. In contrast to the arguments in FWY, we find that both components of accruals have a strong positive relation with SEC enforcement actions, suggesting that noncurrent operating accruals also reflect managerial manipulation. These results suggest that both components of accruals are characterized by temporarily aggressive accounting distortions that are attributable to managerial discretion.

Panel C of Table 5 report results from regressions of SEC enforcement actions on the growth and efficiency components of accruals. Both components are significantly related to SEC enforcement actions. The significance of sales growth is puzzling. A potential explanation is that sales growth reflects temporary accounting distortions arising from revenue manipulation. Consistent with this explanation, prior research has documented that revenue manipulation is a leading technique of earnings manipulation (see Dechow et al. 1995; Dechow and Schrand 2004). Assuming that revenue manipulation explains the significance of sales growth, the negative coefficient on *SG* in Table 4 may also be driven by accounting distortions as opposed to diminishing marginal returns to investment. There are,

[15] The sales growth and efficiency measures potentially contain measurement error for firms engaging in merger or acquisition activity during the sample year. As a robustness check, we eliminate all observations with an increase in goodwill from prior year and re-estimated the regressions (reducing the sample size to 96,116 observations). The results are qualitatively similar.

TABLE 5
Logistic Regressions of SEC Enforcement Actions on Total Operating Accruals
(the sample consists of 76,165 firm-year observations from 1979 to 2001)

Panel A: Logistic Regressions for Total Operating Accruals

$$SECAction_t = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 ACC_t + v_t$$

Regression Coefficient	γ_0	γ_1	γ_2	Model Chi-Square	p-value
Estimated value	−6.49	0.21	1.28	51.77	(0.0001)
(p-value)	(0.0001)	(0.2574)	(0.0001)		

Panel B: Logistic Regressions for Working Capital and Noncurrent Operating Components of Accruals

$$SECAction_t = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 \Delta WC_t + \gamma_3 \Delta NCO_t + v_t$$

Regression Coefficient	γ_0	γ_1	γ_2	γ_3	Model Chi-Square	p-value
Estimated value	−6.29	0.26	1.24		32.59	(0.0001)
(p-value)	(0.0001)	(0.1964)	(0.0001)			
	−6.36	0.35		1.05	30.73	(0.0001)
	(0.0001)	(0.0708)		(0.0001)		
	−6.39	0.21	0.94	0.84	50.43	(0.0001)
	(0.0001)	(0.2636)	(0.0001)	(0.0002)		

Panel C: Logistic Regressions for Growth and Efficiency Components of Accruals

$$SECAction_t = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + v_t$$

Regression Coefficient	γ_0	γ_1	γ_2	γ_3	γ_4	Model Chi-Square	p-value
Estimated value	−6.49	0.33	1.36			47.06	(0.0001)
(p-value)	(0.0001)	(0.0828)	(0.0001)				
	−6.23	0.44		0.65		14.81	(0.0006)
	(0.0001)	(0.0339)		(0.0019)			
	−6.18	0.34			1.29	24.70	(0.0001)
	(0.0001)	(0.1039)			(0.0001)		
	−6.52	0.22	1.40	0.60	0.27	73.22	(0.0001)
	(0.0001)	(0.2237)	(0.0001)	(0.0333)	(0.4129)		

We identified firms subject to a SEC enforcement action via a reading of the SEC Accounting and Auditing Enforcement Releases from 1979–2001.

p-values are presented below the coefficients.

$SECAction_t$ = an indicator variable equal to 1 if the firm-year observation is subject to a SEC Enforcement Action in year t, and 0 otherwise;

$RNOA$ = return on net operating assets for the current year. It is calculated as income from continuing operations (Compustat Item #178) deflated by beginning net operating assets;

ACC = total operating accruals defined as the change in Net Operating Assets (NOA). It is calculated as $[(NOA_t - NOA_{t-1})/NOA_{t-1}]$;

NOA = Operating Assets (OA) − Operating Liabilities (OL);

OA = the sum of Current Operating Assets (COA) and Noncurrent Operating Assets ($NCOA$);

OL = the sum of Current Operating Liabilities (COL) and Noncurrent Operating Liabilities ($NCOL$);

(*continued on next page*)

TABLE 5 (Continued)

COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1);
NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32);
COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34);
NCOL = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9);
Change in working capital (ΔWC) = $[(WC_t - WC_{t-1})/NOA_{t-1}$, where $WC = (COA - COL)$;
Change in noncurrent operating accruals (ΔNCO) = $[(NCO_t - NCO_{t-1})/NOA_{t-1}$, where $NCO = (NCOA - NCOL)$;
SG = sales growth calculated as $[(Sales_t/Sales_{t-1}) - 1]$, where sales is Compustat Item #12; and

$$\Delta AT = \left[\left(\frac{Sales_t}{NOA_t}\right) - \left(\frac{Sales_{t-1}}{NOA_{t-1}}\right)\right] \Big/ \frac{Sales_t}{NOA_t}.$$

TABLE 6
Regressions of Total Operating Accrual Ranks on Current and Lagged SEC Enforcement Actions
(the sample consists of 76,165 firm-year observations from 1979 to 2001)

$$\textit{Rank of } ACC_t = \gamma_0 + \gamma_1 SECAction_t + \gamma_2 SECAction_{t-1} + \gamma_3 SECAction_{t-2} + \gamma_4 SECAction_{t-3} + \upsilon_t$$

		γ_0	γ_1	γ_2	γ_3	γ_4	Adj. R^2
	Model 1:	0.478	0.155				0.0005
		(394.67)	(5.89)				
	Model 2:	0.479	0.192	−0.078			0.0006
Coefficient		(394.62)	(6.36)	(−2.51)			
(t-statistic)	Model 3:	0.467	0.169	0.023	−0.165		0.0009
		(364.59)	(5.18)	(0.62)	(−4.71)		
	Model 4:	0.460	0.165	0.027	−0.119	−0.081	0.0009
		(339.47)	(4.59)	(0.69)	(−2.90)	(−2.13)	

We assign firms into ten-equal-sized portfolios each year based on the magnitude of *ACC*. The rank is standardized to range from 0 to 1. We use this rank as our dependent variable in the regression analysis above. Results are similar if we instead use the raw accrual measure.
$SECAction_t$ = an indicator variable equal to 1 if the firm-year observation is subject to a SEC Enforcement Action in year *t*, and 0 otherwise. We identified firms subject to a SEC enforcement actions via a reading of the SEC Accounting and Auditing Enforcement Releases from 1979–2001;
ACC = total operating accruals defined as the change in Net Operating Assets (*NOA*). It is calculated as $[(NOA_t - NOA_{t-1})/NOA_{t-1}]$;
NOA = Operating Assets (*OA*) − Operating Liabilities (*OL*);
OA = the sum of Current Operating Assets (*COA*) and Noncurrent Operating Assets (*NCOA*);
OL = the sum of Current Operating Liabilities (*COL*) and Noncurrent Operating Liabilities (*NCOL*);
COA = Current Assets (Compustat Item #4) − Cash and Short-Term Investments (*STI*) (Compustat Item #1);
NCOA = Total Assets (Compustat Item #6) − Current Assets (Compustat Item #4) − Investments and Advances (Compustat Item #32);
COL = Current Liabilities (Compustat Item #5) − Debt in Current Liabilities (Compustat Item #34); and
NCOL = Total Liabilities (Compustat Item #181) − Current Liabilities (Compustat Item #5) − Long-Term Debt (Compustat Item #9).

however, two alternative explanations for this result. First, the SEC may disproportionately target high-growth firms. Such firms are more likely to be raising new capital, thus making them more likely targets for SEC enforcement actions. Second, recall from the numerical example in Section III that permanently aggressive accounting combined with positive growth can cause earnings to be temporarily overstated. Thus, the SEC may only target cases of permanently aggressive accounting in the presence of positive sales growth, because this is the only situation where earnings are overstated.

We can use the SEC enforcement action data to investigate one additional implication of the accounting distortion explanation. Recall from the numerical examples in Table 1 that the negative relation between accruals and future profitability is consistent with both temporary accounting distortions and the interaction of permanently aggressive accounting with real investment growth. One difference between these two cases is that temporarily aggressive accounting distortions involve the understatement of accruals in subsequent periods (see Panel E of Table 1). The interaction of permanently aggressive accounting with growth, in contrast, does not involve the understatement of accruals in future periods (see Panel C of Table 1). To discriminate between these two explanations, we therefore investigate the relation between accruals and *lagged* SEC enforcement actions (in other words, we investigate the relation between SEC enforcement actions and *subsequent* accruals). If temporarily aggressive accounting distortions drive the high accruals at the time of SEC enforcement actions, then the subsequent reversal of these distortions should lead to a negative relation between accruals and *lagged* SEC enforcement actions. Note that all accrual reversals take place in the very next period in our examples. In practice, however, accrual reversals may take longer than one year. We therefore test for this possibility in Table 6 by examining up to three years of lagged SEC enforcement actions.

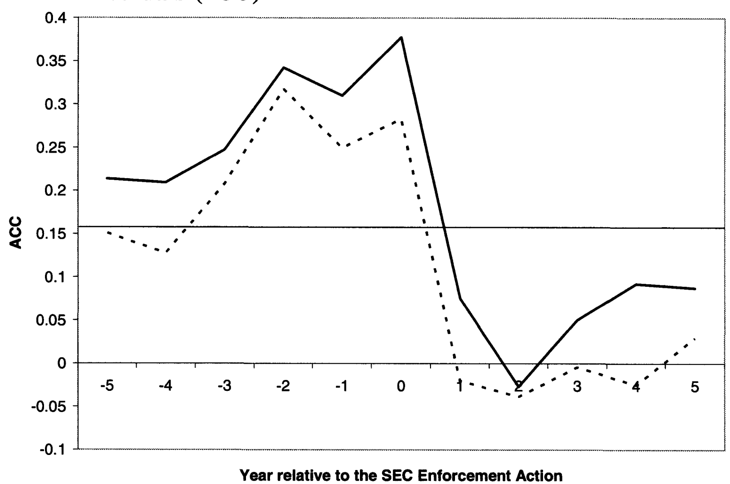
Consistent with the results in Table 5, Table 6 documents a strong positive contemporaneous relation between accruals and SEC enforcement actions (the coefficient on γ_1 is always statistically positive). More importantly, the addition of lagged accruals to the regression reveals evidence of significantly negative coefficients, particularly at the second and third lags. This evidence is consistent with the existence of temporarily aggressive accounting distortions at the time of SEC enforcement actions that take two to three years to reverse. It suggests that, at least for the SEC enforcement action subsample, the properties of accruals are attributable to temporarily aggressive accounting rather than the interaction of permanently aggressive accounting with growth in real investment.

The results from our SEC enforcement action tests are summarized in Figure 2. This figure plots *ACC*, *RNOA*, *SG*, and ΔAT for the SEC sample over the 11-year window centered on the alleged earnings overstatement. Panel A plots the mean and median values of *ACC* for the SEC sample. The solid line across the middle of the graph plots the average *ACC* for our entire sample of 0.164 as a visual benchmark. The graph clearly shows that accruals are unusually high in the year of the alleged earnings overstatement and the two preceding years. Accruals then post a sharp decline in the year immediately following the overstatement and remain unusually low for the next several years. Panel B plots the mean and median values of *RNOA* for the SEC sample. This graph shows that the sharp reduction in accruals between year 0 and year 1 causes a corresponding sharp reduction in *RNOA*. *RNOA* is unusually high in the years leading up to the SEC enforcement action and unusually low thereafter. Panel C demonstrates that the *SG* component of accruals is temporarily high in the year of the alleged earnings overstatement and temporarily low in the following years. This result is consistent with revenue-based earnings manipulations that temporarily inflate sales growth. Panel D demonstrates that the ΔAT component of accruals is temporarily low in the year of the alleged earnings overstatement and temporarily high in the following years. This result is consistent with temporarily aggressive accounting distortions at the time of SEC enforcement actions that reverse in subsequent years.

FIGURE 2
Event-Time Plots of Accruals (*ACC*), Accounting Rate of Return (*RNOA*), Sales Growth (*SG*), and Change in Asset Turnover (Δ*AT*) for Firms Subject to SEC Enforcement Actions

Year 0 represents the year that a firm was subject to an SEC enforcement action for an alleged earnings overstatement. The solid (dashed) line reflects the mean (median) of the respective variable.

Panel A: Accruals (*ACC*)



Panel B: Accounting Rates of Return (*RNOA*)

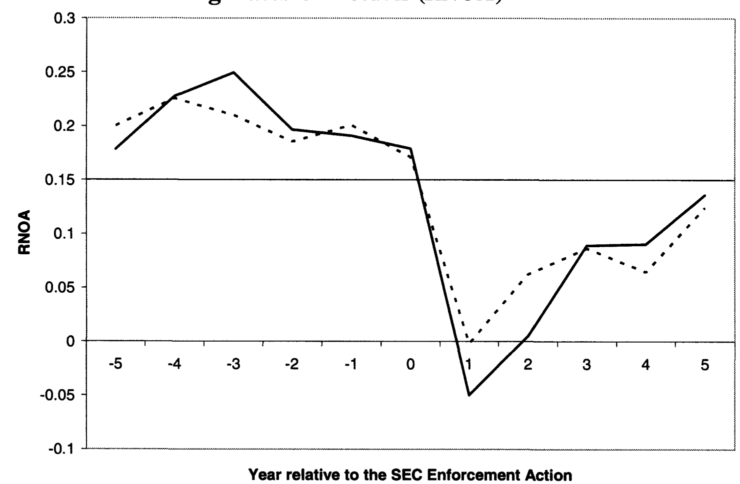


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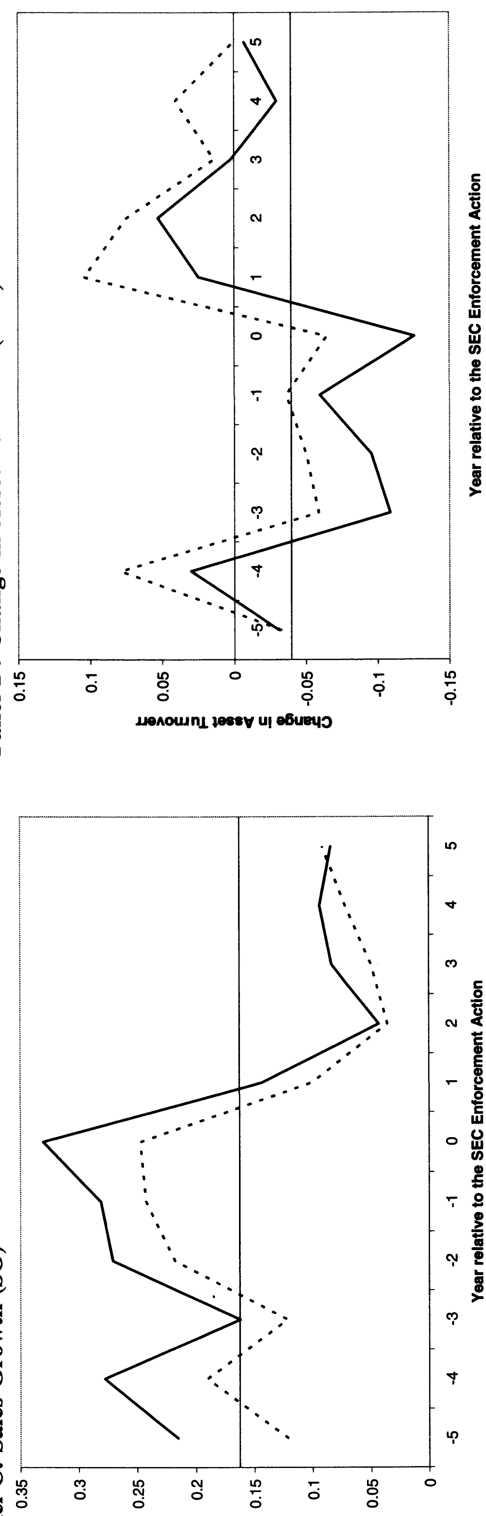
FIGURE 2 (continued)

Panel C: Sales Growth (*SG*)

Panel D: Change in Asset Turnover (*ΔAT*)



VI. CONCLUSION

This paper examines the role of accounting distortions in explaining the lower persistence of the accrual component of earnings. A number of recent papers have argued that the lower persistence of the accrual component of earnings is more likely to be attributable to diminishing marginal returns to new investment and other "growth-based" explanations rather than to accounting-based explanations. In contrast, our analysis and empirical evidence suggests that temporary accounting distortions play an important role. At the same time, we are unable to rule out a supplementary role for growth-based explanations, such as diminishing marginal returns to new investment. We conclude that temporary accounting distortions are a significant contributing factor to the lower persistence of the accrual component of earnings. Our analysis of SEC enforcement actions also indicates that some of these accounting distortions are attributable to intentional managerial manipulation of accruals.

Our findings reinforce the importance of accounting analysis in the evaluation of financial performance. Accrual accounting seeks to provide more relevant information to investors. The increase in relevance, however, comes at the cost of reduced reliability. Reduced reliability manifests itself in the form of transitory estimation error in accruals and increased opportunities for the opportunistic use of managerial accounting discretion in setting accruals. Our evidence indicates that the lower persistence of the accrual component of earnings is a direct manifestation of this crucial trade-off between relevance and reliability. Our findings suggest that the current push by accounting standard setters toward "fair value" accounting is likely to increase the frequency and magnitude of accounting distortions, leading to a reduction in the persistence and reliability of earnings.

Future research could further examine the impact of this trade-off on the properties of accounting numbers. A detailed examination of specific accruals categories (e.g., inventory, receivables) could provide detailed corroborating evidence on the role of temporary accounting distortions. Additional topics for future research include: (1) the determination of which accruals are most subject to accounting distortions; (2) the detailed documentation of the origination and reversal of such distortions; and (2) the identification of external factors facilitating accounting distortions, such as subjective accounting standards and weak corporate governance.

APPENDIX
Proof of Growth and Efficiency Decomposition in Equation (4)

$$\text{Total Net Accruals} = \Delta NOA_t / NOA_{t-1}$$
$$= \underbrace{\Delta \text{Sales}_t / Sales_{t-1}}_{\substack{\text{Sales}\\ \text{Growth}}} - \underbrace{\Delta AT_t / AT_t}_{\substack{\text{Change in}\\ \text{Efficiency}}} - \underbrace{(\Delta Sales_t / Sales_{t-1})*(\Delta AT_t / AT_t)}_{\text{Interaction}} \tag{4}$$

The RHS of this expression can be reduced to the LHS as follows:

$$\frac{S_t - S_{t-1}}{S_{t-1}} - \frac{\frac{S_t}{NOA_t} - \frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} - \frac{S_t - S_{t-1}}{S_{t-1}} * \frac{\frac{S_t}{NOA_t} - \frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}}$$

$$= \frac{S_t - S_{t-1}}{S_{t-1}} - \left(\frac{\frac{S_t}{NOA_t}}{\frac{S_t}{NOA_t}} - \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} \right) - \frac{S_t - S_{t-1}}{S_{t-1}} * \left(\frac{\frac{S_t}{NOA_t}}{\frac{S_t}{NOA_t}} - \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} \right)$$

$$= \frac{S_t - S_{t-1}}{S_{t-1}} - 1 + \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} - \frac{S_t - S_{t-1}}{S_{t-1}} * \left(1 - \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} \right)$$

$$= \frac{S_t - S_{t-1}}{S_{t-1}} - 1 + \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}} - \frac{S_t - S_{t-1}}{S_{t-1}} + \frac{S_t - S_{t-1}}{S_{t-1}} * \frac{\frac{S_{t-1}}{NOA_{t-1}}}{\frac{S_t}{NOA_t}}$$

$$= -1 + \frac{S_{t-1}}{NOA_{t-1}} * \frac{NOA_t}{S_t} + \frac{S_t - S_{t-1}}{S_{t-1}} * \frac{S_{t-1}}{NOA_{t-1}} * \frac{NOA_t}{S_t}$$

$$= -1 + \frac{S_{t-1}}{NOA_{t-1}} * \frac{NOA_t}{S_t} * \frac{S_{t-1}}{S_{t-1}} + \frac{S_t - S_{t-1}}{S_{t-1}} * \frac{S_{t-1}}{NOA_{t-1}} * \frac{NOA_t}{S_t}$$

$$= -1 + \frac{S_{t-1} NOA_t S_{t-1}}{NOA_{t-1} S_t S_{t-1}} + \frac{S_t S_{t-1} NOA_t}{NOA_{t-1} S_t S_{t-1}} - \frac{S_{t-1} S_{t-1} NOA_t}{NOA_{t-1} S_t S_{t-1}}$$

$$= -1 + \frac{S_t S_{t-1} NOA_t}{NOA_{t-1} S_t S_{t-1}}$$

$$= -1 + \frac{NOA_t}{NOA_{t-1}}$$

$$= \frac{NOA_t - NOA_{t-1}}{NOA_{t-1}}$$

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