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Fundamentals of Accounting Losses

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ABSTRACT: This paper examines accounting and nonaccounting factors behind accounting losses over a 50-year period. Using multivariate time-series analysis, we report evidence that the annual percentage of losses for U.S. firms is significantly related to accounting conservatism, Compustat coverage of small firms, real firm performance as measured by cash flows from operations, and business cycle factors. We further find that nonaccounting factors tend to play the dominant role in explaining accounting losses over our sample period. Our results are robust to alternative definitions of macroeconomic productivity, as well as to varying model specifications. Our findings contribute to the literature on accounting losses and accounting conservatism and have implications for the use of accounting loss information in numerous settings.

Keywords: *accounting losses; accounting conservatism; business cycle; small firms.*

Data Availability: *All data employed in this study are commercially available from the sources described in the text.*

I. INTRODUCTION

Over the last 50 years, as the proportion of firms reporting negative income has increased, many studies have examined various aspects of accounting losses. One strand of research investigates how losses relate to various outcomes, such as security valuation (Collins et al. 1997; Barth et al. 1998; Joos and Plesko 2005), bankruptcy (Barth et al. 1998), and the abandonment option (Hayn 1995; Joos and Plesko 2005). These studies find that non-earnings information, most prominently the book value of equity, takes on a higher degree of relevance for loss firms than for profit firms. Another line of research examines accounting properties associated with negative income. For example, Givoly and Hayn (2000) demonstrate a fall in the return on assets (ROA) over time and attribute this phenomenon to an increase in accounting conservatism, as reflected by nonoperating accruals. Joos and Plesko (2005) show that investors can assess the likelihood that a firm's negative income will persist (or reverse) over time by examining cash flow and accrual components of losses.

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The purpose of our study is to investigate the incremental roles that several fundamental nonaccounting factors play in generating accounting losses over and beyond accounting conservatism. Using aggregated time-series data over a 50-year sample period, 1951–2001, we first show a significantly positive temporal association between accounting losses and accounting conservatism, a result consistent with Givoly and Hayn (2000). We build on these results by adding firm size, real performance as measured using cash flows from operations (CFO), and business cycle effects to a multivariate regression of the frequency of accounting losses on conservatism and these additional factors. Our main findings are twofold. First, after controlling for accounting conservatism, the frequency of accounting losses is positively related to the proportion of small firms reported on Compustat and negatively related to firms' CFO and to macroeconomic productivity. Second, while accounting conservatism remains a significant determinant of accounting losses, its overall contribution is lessened considerably when placed alongside the other independent variables. This effect is especially magnified when, as a sensitivity test, we replace loss frequency with median ROA and repeat our analysis; here we find that only the nonaccounting factors are significant determinants of profitability levels over time. Overall, our results suggest that while both accounting and nonaccounting factors are related systematically to accounting losses, nonaccounting factors tend to play the dominant role.

In additional sensitivity tests, we use alternative measures of accounting conservatism and the business cycle in our regression analyses. Our nonaccounting determinants remain robust to whether we use nonoperating accruals, an earnings-return metric (Basu 1997), or the market-to-book ratio (Beaver and Ryan 2000) as a proxy for accounting conservatism. However, we find that only nonoperating accruals and the earnings-return measures are significantly related to the frequency of losses, a finding consistent with the growing literature showing differences among accounting conservatism measures (Watts 2003; Givoly et al. 2004; Roychowdhury and Watts 2004). To capture different aspects and timing of the business cycle, we use three measures—the yearly change in real gross domestic product (ΔGDP), the yearly change in industrial production (ΔIP,) and the National Bureau of Economic Research's (NBER) definition of an expansion or recession. Our results are robust to these alternative measures of macroeconomic productivity.

We also control for time-series trends in the data in two ways. First, we take differences of our model inputs and find that year-to-year changes in the percentage of loss firms are significantly related to changes in the Compustat coverage of small firms, changes in real firm performance, and growth in macroeconomic productivity. In contrast, we find no evidence that changes in the degree of accounting conservatism are associated with changes in loss frequency. Next, we add a trend variable to our levels model and find that our inferences on the nonaccounting variables are unchanged.

Last, we perform additional analysis to explore why small firms report more losses. We provide evidence that small firms are less diversified, have more idiosyncratic risk, invest more, and are more likely to fail than larger firms. We further find that these firm characteristics are similarly related to loss firms *vis-à-vis* profit firms. We conclude that the economic fundamentals of small firms contribute to their likelihood of realizing accounting losses over time.

Our study contributes to the literature in several ways. We expand on existing accounting research that examines determinants behind losses by shedding light on how nonaccounting factors are associated with negative income, after controlling for accounting conservatism. Our evidence suggests that nonaccounting factors, and firm size in particular, play the dominant role over accounting conservatism in determining losses.

We expand on our result on firm size by exploring reasons why small firms are more likely to report losses than are larger firms. Specifically, we show that economic factors intrinsic to small firms make it more likely for these firms to report losses than larger firms. As such, we extend recent findings by Fama and French (2001, 2004), who report that smaller firms generally report lower earnings than larger firms during their sample periods.

We extend the prior literature on analyzing losses by using annually aggregated, market-wide data in our main empirical tests rather than firm-specific data. There are several advantages to taking this approach. It allows us to relate macroeconomic variables to losses—in particular, our business cycle variables are time-dependent macroeconomic variables. In addition, aggregating variables annually provides insights into the long-term time trends of our variables, while firm-specific variables do not lend themselves easily to this task. Aggregation also filters out idiosyncratic components of information that are uncorrelated across firms. For example, Kothari et al. (2003) find that aggregating earnings over time minimizes the effects of noise in firms' earnings. Skinner (2004) makes a similar argument for the relation between dividends and earnings.

Finally, accounting income, and losses in particular, are relevant in determining security valuations, bankruptcy probabilities, and abandonment options. Accounting earnings and losses are inputs in contracting, shareholder litigation, dividend policy, market listing standards, and regulatory inquiries. Our study implies that focusing on accounting conservatism alone could result in poor decision-making.

To illustrate, Hayn (1995) and Joos and Plesko (2005) examine how accounting data influence strings of losses, which, in turn, allow managers to better evaluate its firm abandonment option. By discerning nonaccounting determinants of losses, managers can better assess the permanence and risks inherent to an observed loss and decide in a timelier manner if and when to cease operations. Similarly, security valuation models using net income or changes in net income as independent variables could encompass nonaccounting determinants of losses as additional valuation factors for loss firms.

With regard to contracting, Dichev and Skinner (2002) find that net income frequently is used in accounting-based debt covenants, either directly through a debt to "cash flow" ratio, where cash flow can be cash flows from operations, EBIT, or EBITDA, or indirectly through net worth, where net worth is diminished by accounting losses. They also show that while 30 percent of all loans are in technical default, lenders appear to weigh whether violators are in financial distress, and often waive the violations for financially healthy firms. Since most technical defaulters have negative income (Dichev and Skinner 2002; DeFond and Jiambalvo 1994), understanding the fundamentals behind losses would assist lenders in determining when to call the loan. Likewise, boards of directors can construct executive compensation contracts to minimize the effects of macroeconomic factors as it relates to accounting-based bonuses.

The remainder of the paper is organized as follows. We present our hypotheses linking accounting losses to accounting and nonaccounting factors in Section II and our regression framework in Section III. We describe our data in Section IV and present main results in Section V. In Section VI, we discuss the results of our robustness tests. In Section VII, we perform additional analysis examining why small firms report more losses. Finally, in Section VIII, we summarize and conclude the paper.

II. HYPOTHESES

Our study focuses on the associations between accounting losses and nonaccounting factors after controlling for accounting conservatism. In this section, we discuss hypotheses linking accounting losses to three nonaccounting factors: Compustat coverage of small firms, real performance as measured by cash flows from operations, and macroeconomic productivity. We begin by discussing the already established link between accounting losses and accounting conservatism.

Accounting Conservatism

Based on Givoly and Hayn's (2000) findings, we expect a positive relation between the frequency of accounting losses and accounting conservatism. Givoly and Hayn (2000) show a decline in ROA and a subsequent increase in nonoperating accruals over time for a constant sample of 896 Compustat firms between 1951 and 1998. Their results, along with no marked deterioration in CFO (scaled by total assets) for the same sample, support the hypothesis that the observed decrease in accounting income over time mirrors an increase in accounting conservatism over the same time period.

There are several differences between our study and Givoly and Hayn (2000). One primary distinction is that, in contrast to their study, we use the nearly universal Compustat database. Other differences are that they use firm-specific data and analyze ROA, whereas we utilize an aggregated approach to study the annual frequency of accounting losses.

Compustat Coverage of Small Firms

We predict a positive association between the annual percentage of losses and the rise in the percentage of small firms appearing on the Compustat database over time. Our prediction is consistent with Fama and French (2001, 2004), who report a temporal increase in the percentage of small firms appearing on both the Compustat and CRSP databases, as well as the fact that smaller firms generally report lower earnings than larger firms over their sample period.

There are several possible reasons why small firms are more likely to report losses than larger firms. Many small firms are in the earlier stages of development and therefore are less likely to be reporting positive earnings. Small firms have more volatility in their operations due to being less diversified, being more dependent on fewer customers and/or suppliers, and undertaking more risky investments. Thus, they may alternate between reporting positive earnings and losses. Many small firms are failing companies and therefore are more likely to report losses than larger firms. Thus, we posit that small firms are riskier than larger firms, which, in turn, results in higher incidences of accounting losses over time. We provide additional analysis of why small firms are more likely to report losses in Section VII.

Business Cycle and Macroeconomic Productivity

We predict a negative relation between the frequency of accounting losses and macroeconomic productivity.[1] Business cycles generally are divided into expansions, representing ''high'' growth rates in economic productivity, and recessions or contractions, which

[1] Examination of links between accounting earnings and macroeconomic factors has been relatively unexplored in the accounting and economic literature. Johnson (1999) documents that earnings response coefficients (ERC) and earnings persistence are related to business cycles. Stern (1955) finds a ''fairly close correlation'' between contemporaneous industrial production and ''money profits in industry'' in the United Kingdom and the United States for the years 1919–1950. Chant (1980) reports a positive relation between leading money supply (M1) and current accounting earnings for 1958–1977; Levi (1980) finds a similar association between the change in M1 and the level of accounting earnings for 1949–1975. Chant (1980), however, finds no relation between bank loans and accounting earnings, and Alessi (1964) reports none between inflation and accounting earnings.

are declines in economic productivity levels.[2] Although there are several measures of macroeconomic productivity, two commonly used statistics are the gross domestic product (GDP) and industrial production (IP).

As Hall (1990) shows, there are vast differences in economic variables during expansions and recessions. Using data from 1919 through 1982, he finds that over all expansions, average real GDP rises by 6.0 percent, average real consumption rises by 4.3 percent, and average real investment rises by 27.7 percent. In contrast, the average changes over all recessions are −5.4 percent for real GDP, −0.5 percent for real consumption, and −27.8 percent for real investments. These statistics suggest that firms invest more and that consumers spend more during periods of high macroeconomic productivity and, conversely, firms and consumers cut expenditures during periods of low or negative macroeconomic productivity. We predict that these patterns of expenditures will result in higher frequencies of accounting losses during recessions or periods of low economic productivity.

Cash Flows from Operations

We predict a negative association between the frequency of accounting losses and aggregate cash flows from operations (CFO). CFO includes cash transactions involved in the firm's delivering or producing goods or providing services and, therefore, we view it as a measure of the firm's real performance. In Section V, we present evidence consistent with this view.

III. REGRESSION FRAMEWORK

Unlike most accounting studies that use firm-specific data, we adopt a market-wide approach, regressing the annual percentage of accounting losses for the 1951–2001 period on four aggregated accounting and nonaccounting variables.[3] The basic regression is:

$$\%LOSSES_t = \beta_0 + \beta_1 CNSV_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \varepsilon_t \qquad (1)$$

where:

$\%LOSSES_t$ = the percentage of Compustat firms reporting accounting losses for year t;
$CNSV_t$ = a measure of accounting conservatism for year t;
$SMALL_t$ = the measure of the relative number of small firms in the Compustat database for year t;
$BUSCYC_t$ = a measure of macroeconomic productivity for year t; and
$CFOA_t$ = mean cash flows from operations divided by assets for year t.

As described in Section II, we choose these independent variables because they measure potentially significant aspects of firms' overall earnings processes. In addition, each can be delineated with relative unambiguity as either an accounting or nonaccounting factor. For

[2] A full business cycle covers a recession and subsequent expansion. Zarnowitz (1985) defines a full cycle from the trough of one contraction to the trough of the next contraction. He identifies ten business cycles from 1933 through 1982 and 30 business cycles from 1854 through 1982.

[3] This approach is widely used in the finance literature to examine market-wide trends in market returns (Fama and French 1992); market volatility (Campbell et al. 2001); the equity premium (Fama and French 2002; Claus and Thomas 2001); dividends (Fama and French 2001); and new listings (Fama and French 2004). Two accounting papers that use aggregated data across time are Skinner (2004), who relates aggregated dividends and earnings, and Kothari et al. (2003), who examine the relation between aggregated earnings and returns.

example, *CNSV* is clearly an accounting measure in that its magnitude and direction depends greatly on accounting rules over time. *SMALL* and *BUSCYC* basically are unrelated to accounting conservatism—*SMALL* depends on total assets and *BUSCYC* measures the productivity of the overall U.S. economy. *CFOA* is intended to measure real firm performance, a ''nonaccounting'' metric. Even though CFO is an accounting variable, subject to accounting rules, it is relatively less susceptible to manipulation than accounting earnings or accruals (Dechow 1994; Dechow and Schrand 2004). We discuss the associations among our independent variables later in the paper to assess the classification of these independent variables as ''accounting'' or ''nonaccounting'' factors.

IV. SAMPLE SELECTION, VARIABLE DEFINITIONS, AND DATA DESCRIPTION

Sample Selection

The sample consists of all firm-years for which net income (Compustat item no. 172) and total assets (Compustat item no. 6) are available on the merged Compustat annual industrial file, including PST, full coverage, and research files. This results in 259,116 observations over the period 1951–2001. The total number of firms varies from a low of 614 in 1951 to a high of 10,313 in 1996.

Table 1 presents the annual frequency of losses. The percentages vary from 0.81 percent in 1951 to 45.86 percent in 2001. Consistent with Hayn (1995), Collins et al. (1997), and Collins et al. (1999), we find that the frequency of losses has risen steadily over time. Frequency rates for each decade are 3.44 percent for 1951–1960, 7.28 percent for 1961–1970, 13.95 percent for 1971–1980, 30.09 percent for 1981–1990, and 35.96 percent for 1991–2001.

Accounting Conservatism

We use the same accounting conservatism measure as Givoly and Hayn (2000). The firm's nonoperating accruals (*NOPACC*) are defined as total accruals (net income minus cash flows from operations) plus depreciation and amortization minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) divided by beginning period total assets. Removal of these items from total accruals leaves us primarily with gains and losses from nonoperating assets, bad debt expense, restructuring charges, write-downs of assets, deferred income taxes, write-offs of in-process R&D expenses, and other expenses or revenues not included in the operating accrual accounts. Since most nonoperating accruals are expenses or losses, we equate accounting conservatism of the income statement with larger negative amounts.

We choose this measure initially over the Basu (1997) earnings-returns and Beaver and Ryan's (2000) book-to-market value of equity measures for two main reasons. First, *NOPACC* is based on accounting data only. In contrast, the other two measures are market-dependent. Second, several studies (e.g., Dietrich et al. 2003; Givoly et al. 2004) have questioned the reliability of the earnings-return measure as a proxy for accounting conservatism. In fact, Givoly et al. (2004) present evidence of a negative relation between the earnings-return measure and alternative accounting conservatism measures and point to measurement error in the earnings-return measure as a prime reason for these observed observations. In Section VI, we present sensitivity tests in which we use the earnings-returns and book-to-market measures to examine differences among these definitions of accounting conservatism.

TABLE 1
Frequency of Accounting Losses by Year

Year	Total Number of Firms	% of Losses	Year	Total Number of Firms	% of Losses
1951	614	0.81	1979	5,875	13.14
1952	625	1.76	1980	5,988	16.35
1953	636	1.42	1981	6,076	19.55
1954	653	2.91	1982	6,327	25.51
1955	674	1.78	1983	6,604	25.92
1956	692	2.17	1984	6,658	26.65
1957	712	1.97	1985	6,940	31.43
1958	735	3.54	1986	7,256	33.13
1959	763	2.23	1987	7,350	33.33
1960	1,372	9.40	1988	7,250	32.63
1961	1,699	8.18	1989	7,176	34.56
1962	1,918	6.20	1990	7,203	35.37
1963	2,169	6.32	1991	7,366	36.32
1964	2,334	5.36	1992	7,798	34.87
1965	2,489	4.06	1993	8,901	32.00
1966	2,666	4.01	1994	9,310	28.94
1967	2,846	4.88	1995	10,108	31.48
1968	3,430	5.80	1996	10,313	32.14
1969	3,634	8.91	1997	10,056	33.99
1970	3,704	15.31	1998	10,303	39.25
1971	3,895	13.71	1999	10,257	40.13
1972	4,076	8.88	2000	9,531	41.75
1973	4,467	8.46	2001	7,967	45.86
1974	5,885	16.86	1951–1960	7,476	3.44
1975	5,917	18.34	1961–1970	26,889	7.28
1976	5,953	14.53	1971–1980	54,001	13.95
1977	6,009	13.91	1981–1990	68,840	30.09
1978	5,936	12.37	1991–2001	101,910	35.96
			All years	259,116	25.84

Accounting losses are negative values of net income (Compustat item no. 172).

Table 2, Panel A shows the mean and median values of *NOPACC* by decade. *NOPACC* declines in the 1960s, remains relatively constant in the 1970s, and falls dramatically in the 1980s and 1990s. The large negative growth in *NOPACC* in the latter period parallels that presented by Givoly and Hayn (2000) for their constant sample of 896 firms, ending in 1998. Thus, while not monotonic, there nevertheless is a steady rise in accounting conservatism for the full Compustat sample over our time period.

Compustat Coverage of Small Firms

We estimate *SMALL* by comparing the total assets of each firm to the population of NYSE firms (see Fama and French 2001, 2004). For each year, we rank all NYSE firms

TABLE 2
Descriptive Statistics

Panel A: Accounting Conservatism, Percentage of Small Firms, ΔGDP, ΔIP, and CFO By Decade

Time Period	NOPACC		SMALL		ΔGDP		ΔIP		CFOA	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1951–1960	−0.011	−0.007	0.285	0.274	0.035	0.032	0.028	0.035	0.101	0.104
1961–1970	−0.015	−0.018	0.452	0.438	0.042	0.045	0.054	0.056	0.084	0.087
1971–1980	−0.015	−0.015	0.592	0.617	0.032	0.040	0.035	0.042	0.074	0.073
1981–1990	−0.034	−0.032	0.641	0.640	0.032	0.035	0.019	0.024	0.041	0.036
1991–2001	−0.052	−0.043	0.665	0.665	0.033	0.038	0.032	0.038	0.013	0.016

Panel B: NBER Definitions of Recession/Expansion Subperiods

Recession	Expansion
Aug 1953–May 1954	Nov 1949–Jul 1953
Sept 1957–Apr 1958	Jun 1954–Aug 1957
May 1960–Feb 1961	May 1958–Apr 1960
Jan 1970–Nov 1970	Mar 1961–Dec 1969
Dec 1973–Mar 1975	Dec 1970–Nov 1973
Feb 1980–July 1980	Apr 1975–Jan 1980
Aug 1981–Nov 1982	Aug 1980–Jul 1981
Aug 1990–Mar 1991	Dec 1982–July 1990
Apr 2001–Dec 2001	Apr 1991–Mar 2001

The National Bureau of Economic Research (NBER) divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth.

Variable Definitions:

NOPACC, or nonoperating accruals = defined as total accruals (net income − cash flow from operations) minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) plus depreciation and amortization expenses, all divided by beginning period total assets;

SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;

Δ*GDP* = the annual percentage change in real gross domestic product, compiled by the U.S. Department of Commerce;

Δ*IP* = the annual percentage change in total industrial production, compiled by the Federal Reserve; and

CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations − Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital.

by their total assets and classify as ''small'' all NYSE, AMEX, and NASDAQ firms that have total assets less than the 25th percentile of NYSE firms.

As Table 2, Panel A shows, both mean and median percentages of all firms on the Compustat tape classified as small rise in the 1960s but explode after 1970 to over 60 percent of the total listings. To a great extent, this pattern parallels Compustat's increased coverage of NASDAQ firms during our time period.[4] For example, in 1950, NASDAQ firms represent 17 percent of the available firms on Compustat (105 out of 615). By 1975 this percentage increases to 55 percent, and to 67 percent by 1997.

In addition, NASDAQ firms are, on average, smaller than exchange-listed firms. For our sample from 1970–2001, the average (median) asset size for NASDAQ firms is $729.1 ($650.2) million, compared to $3,653.6 ($2,594.4) million for NYSE-AMEX firms. In fact, despite the success of many NASDAQ firms in the latter period, the differential in asset size actually grew throughout the time period. In 1951, the average NYSE-AMEX firm was 1.07 times larger than the average NASDAQ firm. By 1970, the differential was 1.79; by 1992, the average NYSE-AMEX firm was 4.35 times larger than the average NASDAQ firm; and by 2000, the multiple reached 6.84. There are various reasons behind this phenomenon. One reason is that the NASDAQ has always had less stringent listing requirements than the NYSE or the AMEX. In particular, minimum listing requirements for revenues and assets consistently have been lower for NASDAQ-traded firms.

The Business Cycle and Macroeconomic Productivity

We represent the U.S. business cycle using three alternative measures of macroeconomic productivity. The first measure is an indicator based on the National Bureau of Economic Research's (NBER) definition of expansionary and recessionary periods. The NBER divides the U.S. economy into two economic environments: expansions are from the trough to the peak of business growth, where business growth is measured in total output, income, and employment (see also Moore 1983), and recessions are measured from the peak to the trough. The NBER uses monthly data such as changes in retail sales, the unemployment rate, real wages, and industrial production (see http://www.nber.org; Hall 1990) to delineate peaks and troughs. As shown in Table 2, Panel B, during 1951–2001, there were nine NBER recession periods and nine NBER expansions. We define the variable *RECESS* as equaling 1 if any part of a recessionary period occurs within a calendar year, and 0 otherwise. Other papers using the NBER definition include Johnson (1999) and Chordia and Shivakumar (2002).

The other two measures are the annual percentage change in real gross domestic product (ΔGDP), and the annual percentage change in total industrial production (ΔIP). GDP is compiled by the U.S. Department of Commerce and includes personal consumption, government expenditures, private investment, inventory growth, and the trade balance (see Bureau of Economic Analysis at http://www.BEA.gov). Papers using ΔGDP as a macroeconomic measure of business productivity include Hall (1990) and Cochrane (1991). Although corporate profits are a component of GDP, we note that from 1979 through 2001, net income (after tax) makes up less than 8 percent of GDP (Federal Reserve Bank of St. Louis 2004) and has fluctuated within the 15–17 percent range after World War II (Coggan 2004). Therefore, examining the relation between accounting losses and ΔGDP does not necessarily impose a mechanistic relation between the two. IP, like GDP, measures total real output, but is more limited in scope. It is compiled by the Federal Reserve and includes total production in manufacturing, mining, gas, and electric utilities (see http://www.

[4] Unlike the CRSP database, which started covering NASDAQ stocks in 1973, the Compustat database contains NASDAQ-traded stocks throughout our 51-year period. However, the degree of variability in *SMALL* is limited in the first 20 years of our sample period due to relatively few AMEX or NASDAQ firms being listed on Compustat. To overcome this potential problem, we use an alternative size measure, the coefficient of variation of the log of total assets (the standard deviation divided by the mean). We obtain similar results with this measure; the estimated coefficient on this variable is significantly different from zero at conventional levels in each regression.

federalreserve.gov). Previous studies using ΔIP as a measure of business productivity include Fama (1981) and Chordia and Shivakumar (2002). We obtain the data for ΔGDP and ΔIP from "Economagic.com: Economic Time Series." (See http://economagic.com/popular.htm.)

Table 2, Panel A contains the means and medians by decade for ΔGDP and ΔIP. Unlike the data on *NOPACC* and *SMALL*, ΔGDP and ΔIP do not trend upward or downward over time. Instead, we note a higher growth in ΔGDP and ΔIP during the 1960s, followed by a deterioration of economic productivity over the 1970s and 1980s, followed by a subsequent rise in the 1990s.

Cash Flows from Operations

CFOA is CFO divided by beginning total assets averaged across firms for each year. We define CFO according to GAAP. For the years 1987–2001, CFO is annual Compustat item no. 308. From 1971–1986, it is funds from operations (item no. 110) minus the change in working capital (Δcurrent assets + Δdebt in current liabilities − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus the change in deferred taxes minus the change in working capital (see Rayburn 1987).[5]

As shown in the last two columns of Table 2, Panel A, *CFOA* has declined precipitously over time, dropping from a mean (median) of 0.101 (0.104) in the 1950s to 0.013 (0.016) in the 1991–2001 period. Consistent with Joos and Plesko (2005), we also note a drop in *CFOA* from 1971–1990 to 1991–2001. Both our and Joos and Plesko's (2005) findings are in contrast to Givoly and Hayn (2000), who find no marked deterioration in *CFOA* over time. However, Givoly and Hayn (2000) examine a smaller constant-firm sample, which, by construction, asks a different set of questions than those addressed here.[6]

V. EMPIRICAL RESULTS

Empirical Issues

We estimate Equation (1) using *RECESS*, ΔGDP, and ΔIP as alternative measures of *BUSCYC*. Before presenting the results, we discuss several statistical considerations. First, our research design is biased against finding significant coefficients on the business cycle because there is not perfect overlap between the timing of the expansions and contractions and *%LOSSES*. That is, *%LOSSES* is measured on an annual basis, but business cycles begin and end over varying time periods. Thus, our results will be sensitive to possible mismatching between the business cycles and the accounting measurement period.

Second, as we show in Table 3, there is a great deal of collinearity among the independent variables. For example, *CFOA* is highly positively correlated with *NOPACC* (Pearson $\rho = 0.5471$; $p = 0.0001$) and negatively correlated with *SMALL* (Pearson $\rho = -0.8134$; $p = 0.0001$), implying that the drop in *CFOA* has mirrored the rise in nonoperating accruals and the percentage of small firms over time. Thus, omitting *CFOA* from the regression would result in upwardly biased coefficients on *NOPACC* and *SMALL* that is due to an omitted correlated variable problem. Similarly, *SMALL* and *NOPACC* are highly negatively correlated (Pearson $\rho = -0.4784$; $p = 0.0004$), suggesting that omitting either variable from the regression on *%LOSSES* would produce an upwardly biased coefficient

[5] As a sensitivity check, we use the Rayburn (1987) definition of CFO for all years and rerun our regression analyses with this variable. The coefficient and significance level on CFO with the Rayburn measure is qualitatively the same as with CFO defined above.

[6] If we limit our analysis to a constant sample over 1951–2001, we similarly find no significant decrease in *CFOA* over time, consistent with Givoly and Hayn (2000).

TABLE 3
Correlation Coefficients among Frequency of Losses, Accounting Conservatism, Percentage of Small Firms, Macroeconomic Productivity, and CFO

Variable	*%LOSSES*	*NOPACC*	*SMALL*	*RECESS*	*ΔGDP*	*ΔIP*	*CFOA*
%LOSSES	1.0000	−0.5567	0.9031	−0.0507	−0.2066	−0.1965	−0.9425
	(0.0000)	(0.0001)	(0.0001)	(0.7237)	(0.1458)	(0.1669)	(0.0001)
NOPACC	−0.5163	1.0000	−0.4784	0.3536	−0.3040	0.0339	0.5471
	(0.0001)	(0.0000)	(0.0004)	(0.0109)	(0.0301)	(0.8134)	(0.0001)
SMALL	0.8741	−0.5850	1.0000	−0.0854	−0.1829	−0.1693	−0.8134
	(0.0001)	(0.0001)	(0.0000)	(0.5511)	(0.1990)	(0.2351)	(0.0001)
RECESS	−0.0205	0.4035	−0.1637	1.0000	−0.7422	−0.6092	0.2141
	(0.8867)	(0.0033)	(0.2510)	(0.0000)	(0.0001)	(0.0001)	(0.1314)
ΔGDP	−0.2512	−0.2744	−0.1345	−0.7133	1.0000	0.5421	0.1039
	(0.0754)	(0.0514)	(0.3468)	(0.0001)	(0.0000)	(0.0001)	(0.4679)
ΔIP	−0.2268	0.0070	−0.1555	−0.5760	0.5602	1.0000	0.0667
	(0.1096)	(0.9609)	(0.2760)	(0.0001)	(0.0001)	(0.0000)	(0.6418)
CFOA	−0.9203	0.5752	−0.8622	0.2280	0.1386	0.0985	1.0000
	(0.0001)	(0.0001)	(0.0001)	(0.1075)	(0.3321)	(0.4916)	(0.0000)

Pearson (Spearman) correlation coefficients are presented above (below) the diagonal.
p-values are presented in parentheses.

Variable Definitions:
%LOSSES = the percentage of accounting losses reported for each year;
NOPACC = nonoperating accruals defined as total accruals (net income − cash flow from operations) minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) plus depreciation and amortization expenses, all divided by beginning period total assets;
SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;
RECESS = 1 if the year is included in an NBER recession period, and 0 otherwise. The NBER divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth;
ΔGDP = the annual percentage change in real gross domestic product. Real GDP is compiled monthly by the U.S. Department of Commerce;
ΔIP = the annual percentage change in total industrial production. It is compiled monthly by the Federal Reserve; and
CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations minus Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital.

on the remaining variable. These correlations have implications both for our study and for interpretations of other studies, as they imply that examining bivariate associations between accounting losses (accounting earnings) and a single variable in isolation may result in biased inferences.

Third, *CFOA* is uncorrelated with the business cycle variables. The Pearson correlation coefficient between *CFOA* and *RECESS* is 0.2141 ($p = 0.1314$); between *CFOA* and *ΔGDP* it is 0.1039 ($p = 0.4679$); and between *CFOA* and *ΔIP* it is 0.0667 ($p = 0.6418$). These correlations buttress our assertion that *CFOA* primarily measures firm-specific performance as opposed to being a reflection of the business cycle.

Fourth, although *CFOA* is uncorrelated with the business cycle variables, it is related significantly to *%LOSSES* (Pearson $\rho = -0.9428$; $p = 0.0001$). Therefore, omitting *CFOA* from Equation (1) would lead to an upwardly biased estimator of the variance of β_3, leading to an acceptance of the null hypothesis more frequently than is justified by the given level of significance (Kmenta 1971).

Regression Results

The regressions results are presented in Table 4. We begin by examining the simple regression of *%LOSSES* on accounting conservatism (*NOPACC*) alone. Consistent with Givoly and Hayn (2000), we find a negative relation between the percentage of accounting losses over time and *NOPACC*. The regression coefficient on *NOPACC* is −3.359, with a t-statistic of −5.62 (p-value < 0.01). Because more negative levels of *NOPACC* indicate greater accounting conservatism, these findings are consistent with the view that the annual

TABLE 4
OLS Regressions of Frequency of Losses on Accounting Conservatism, Percentage of Small Firms, Macroeconomic Productivity, and CFO

$$\%LOSSES_t = \beta_0 + \beta_1 NOPACC_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \varepsilon_t$$

Model	Intercept	*NOPACC*	*SMALL*	*BUSCYC*	*CFOA*	Adj. R^2
1	0.095***	−3.359***				38.0%
	(4.36)	(−5.62)				
2	−0.180***	−1.252***	0.796***			85.2%
	(−7.40)	(−3.72)	(12.55)			
3	0.150***	−0.491***	0.374***	0.041***	−2.408***	95.6%
β_3 = *RECESS*	(4.22)	(−3.36)	(7.04)	(4.43)	(−10.36)	
4	0.167***	−0.621**	0.376***	−0.001***	−2.181***	94.9%
β_3 = Δ*GDP*	(4.29)	(−2.61)	(6.55)	(−3.29)	(−8.82)	
5	0.168***	−0.330	0.378***	−0.002***	−2.328***	94.6%
β_3 = Δ*IP*	(4.14)	(−1.44)	(6.36)	(−2.74)	(−9.09)	

*, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, using a two-tailed test.
In Panel B, t-statistics are presented in parentheses.

Variable Definitions:
%LOSSES = the percentage of accounting losses reported for each year;
NOPACC = mean nonoperating accruals, defined as total accruals (net income − cash flow from operations) minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) plus depreciation and amortization expenses, all divided by beginning period total assets;
SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;
BUSCYC = the U.S. business cycle, which we represent using three different measures. The National Bureau of Economic Research (NBER) divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth;
RECESS = 1 if the year is included in an NBER recession period, and 0 otherwise;
Δ*GDP* = the annual percentage change in real gross domestic product. Real GDP is compiled monthly by the U.S. Department of Commerce;
Δ*IP* = the annual percentage change in total industrial production. It is compiled monthly by the Federal Reserve; and
CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations minus Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital.

percent of accounting losses is positively related to the degree of accounting conservatism. The adjusted R^2 indicates that 38.0 percent of the variation in the percentage of annual losses can be explained by accounting conservatism alone. Thus, we corroborate Givoly and Hayn's (2000) results for a larger sample of firms.

In model 2, *SMALL* is added to the regression. The estimated coefficient on *SMALL* is 0.796, with a t-statistic of 12.55 (p-value < 0.01). Thus, as predicted, the temporal increase in the percentage of accounting losses is mirrored by the temporal increase in *SMALL*. The adjusted R^2 is 85.2 percent, compared to an adjusted R^2 of 38.0 percent for the simple regression of *%LOSSES* on *NOPACC*. Testing for the incremental explanatory power of adding *SMALL* yields an F-statistic of 67.1, significant at the 1 percent level, supporting the hypothesis that *%LOSSES* depends not only on *NOPACC*, but also on *SMALL*.

The drop in the estimated coefficient on *NOPACC* from −3.359 in model 1 to −1.252 in model 2 reflects the highly negative correlation between *NOPACC* and *SMALL* that we documented in Table 3.[7] Nonetheless, both variables provide significant explanatory power over the frequency of accounting losses even in the presence of this multicollinearity.

In models 3 through 5, we add the business cycle (*RECESS*, ΔGDP, or ΔIP) and cash flows from operations (*CFOA*) to the multivariate regression. As these regressions show, there are significant associations between *%LOSSES* and the business cycle variables. The coefficients on ΔGDP and ΔIP are negative at the 0.01 level of significance, indicating that *%LOSSES* is negatively related to macroeconomic growth. The coefficient on *RECESS* is significantly positive at the 1 percent level; i.e., *%LOSSES* are higher for years in which there is a recession.

The coefficients on *CFOA* are also significantly negative, consistent with the view that accounting losses are negatively related to the company's firm-specific economic productivity. For both regressions, the estimated coefficient on *CFOA* is statistically significant at the 0.01 level. The regression coefficients on *SMALL* (*NOPACC*) remain significantly positive (negative), with the exception of model 5, in which *NOPACC* is negative but insignificantly different from zero.[8]

To examine the effects of adding these variables to the model, we compare the coefficients on *NOPACC* and *SMALL* from models 3–5 to the regression on *NOPACC* and *SMALL* alone (model 2). The magnitude of the estimated coefficient on *NOPACC* drops from −1.252 to −0.491 in model 3, −0.621 in model 4, and −0.330 in model 5. The coefficient on *SMALL* drops from 0.796 in model 2 to around 0.375 in models 3–5. The explanation behind these declines lies in the significant negative correlations between *CFOA* and *NOPACC* and between *CFOA* and *SMALL*. That is, adding *CFOA* to the regression model reduces the biases in these coefficients.

In summary, we find that accounting losses are related to both accounting conservatism and nonaccounting factors. Specifically, the percentage of losses is directly related to accounting conservatism and the percentage of small firms on Compustat's database; it is

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7 The significant correlation between *NOPACC* and *SMALL* raises the question of whether *SMALL* is truly a "nonaccounting" factor, as we claim. Although the two variables are highly correlated, a regression of *NOPACC* on *SMALL* and a time trend variable reveals that only the trend variable is significant in explaining *NOPACC* levels over time, consistent with our characterization of *SMALL* as unrelated to accounting conservatism.

8 As an alternative measure of cash flows, we use free cash flows instead of cash flows from operations. We define free cash flows as our CFO measure minus capital expenditures (annual Compustat item #128). The correlation between CFO and free cash flows is 0.94. When we substitute free cash flows for CFO in models (3) through (5), we find that the results are qualitatively the same, but weaker. For example, in model (4), the adjusted R^2 falls to 87.8 percent and the intercept becomes insignificantly different from zero. We thus conclude that CFO is a better indicator of real firm performance than free cash flows.

inversely related to the business cycle and to cash flows from operations. Thus, nonaccounting fundamentals add significant incremental information about accounting losses over and beyond accounting conservatism.

VI. ROBUSTNESS TESTS

Using *ROA* as the Dependent Variable

In this section, we examine whether our results apply only to losses or whether they can be generalized to net income-to-total assets (hereafter *ROA*). Givoly and Hayn (2000) define profitability as *ROA* and show a relation between the deterioration of *ROA* over time and the rise of accounting conservatism. Since this paper builds on their work, we consider whether our findings hold for *ROA* over time as well as losses. Further, by understanding the nonaccounting fundamentals behind *ROA*, academics and other users of accounting income can better utilize and interpret net income in general.

We estimate the following regression:

$$ROA_t = \beta_0 + \beta_1 NOPACC_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \varepsilon_t \qquad (2)$$

where ROA_t is the median ROA for year *t*. We measure *ROA* as net income (annual Compustat item no. 172) divided by beginning period total assets.

Table 5, Panel A presents the mean and median *ROA* by decade. Consistent with Givoly and Hayn (2000), there is a steady deterioration of *ROA* over time. In the 1950s, the median *ROA* is 0.068. By the 1980s, the median *ROA* is less than half that amount (0.031), and it falls by almost 50 percent again in the 1990s (0.016). The mean *ROA* shows similar declines, turning negative in the 1980s and remaining negative throughout the 1990s.

Table 5, Panel B shows the summary statistics for Equation (2) using the three definitions of macroeconomic productivity. The results complement those presented in Table 4. The estimated coefficients on *SMALL*, ΔGDP, *RECESS*, and *CFOA* are significantly different from zero at the 0.01 levels and are in the predicted directions. ΔIP is significantly positive at the 0.10 level, and *NOPACC*, the accounting conservatism variable, is insignificantly different from zero. The adjusted R^2 values for the regressions with *ROA* are comparable to those reported with *%LOSSES* as the dependent variable. We conclude that the analyses presented thus far are fairly robust to whether we examine determinants behind accounting losses or income levels, in general. In particular, we find that *nonaccounting* factors influence losses and *ROA* in similar ways.

Alternative Measures of Accounting Conservatism

Several studies assess alternative measures of accounting conservatism and conclude these measures reflect different aspects of the accounting process (Watts 2003; Givoly et al. 2004; Roychowdhury and Watts 2004). To examine the extent to which differing accounting conservatism measures affect our regression analyses, we use two commonly used alternative measures as substitutes for *NOPACC*.

The first measure is Basu's (1997) earnings-returns (*E-R*) metric, which is the γ_2 coefficient in the following regression:

$$EPS_{it}/Price_{i,t-1} = \alpha_0 + \alpha_1 DUM_{it} + \gamma_1 RETURN_{it} + \gamma_2(RETURN_{it} * DUM_{it}) + \varepsilon_{it} \qquad (3)$$

where the *i* and *t* subscripts denote the firm and year, respectively; *EPS* is annual earnings

TABLE 5
Using Return on Assets (*ROA*) as the Dependent Variable

Panel A: *ROA* by Decade

Time Period	Mean	Median
1951–1960	0.072	0.068
1961–1970	0.056	0.054
1971–1980	0.042	0.047
1981–1990	−0.023	0.031
1991–2001	−0.096	0.016

Panel B: OLS Regressions of *ROA* on Accounting Conservatism, Percentage of Small Firms, Macroeconomic Productivity, and CFO

$$ROA_t = \beta_0 + \beta_1 NOPACC_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \varepsilon_t$$

Model	Intercept	*NOPACC*	*SMALL*	*BUSCYC*	*CFOA*	Adj. R^2
1	0.027***	−0.010	−0.027***	0.001***	0.405***	94.8%
$\beta_3 = \Delta GDP$	(4.39)	(−0.26)	(−2.99)	(3.59)	(11.54)	
2	0.024***	0.010	−0.027***	−0.001***	0.430***	92.8%
$\beta_3 = RECESS$	(3.73)	(0.26)	(−2.86)	(−2.86)	(10.41)	
3	0.025***	−0.032	−0.029***	0.0003*	0.449***	92.2%
$\beta_3 = \Delta IP$	(3.64)	(−0.82)	(−2.85)	(1.85)	(10.32)	

*, **, and *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, using a two-tailed test.

In Panel B, t-statistics are presented in parentheses.

Variable Definitions:

ROA = the median return on assets for all firms in year *t*;

NOPACC, nonoperating accruals = defined as total accruals (net income − cash flow from operations) minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) plus depreciation and amortization expenses, all divided by beginning period total assets;

SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;

BUSCYC = the U.S. business cycle, which we represent using three different measures. The National Bureau of Economic Research (NBER) divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth;

RECESS = 1 if the year is included in an NBER recession period, and 0 otherwise;

Δ*GDP* = the annual percentage change in real gross domestic product. Real GDP is compiled monthly by the U.S. Department of Commerce;

Δ*IP* = the annual percentage change in total industrial production. It is compiled monthly by the Federal Reserve; and

CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations minus Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital.

per share; *Price* is the stock price at the beginning of the fiscal year; *DUM* is a dummy variable equal to 1 if the stock return is negative, and 0 otherwise; and *RETURN* is the year's stock return. Individual stock returns are computed over the 12-month period beginning nine months prior to the end of fiscal year *t*. Under Basu's (1997) methodology, γ_2(*E-R*) is expected to be positive. The underlying notion behind this premise is that, with conservative accounting, earnings reflect bad news more quickly than they reflect good news. Thus, we predict a positive relation between *%LOSSES* and *E-R*.

The second measure is the annual market-to-book ratio of equity (see Beaver and Ryan 2000). This measure of conservatism recognizes that the market's valuation of a firm's assets and liabilities can differ substantially from the book value of these assets and liabilities. A ratio greater than 1.0 indicates accounting conservatism of the balance sheet. Accounting reasons for the discrepancies between market and book value of equity include nonrecognition of intangibles (e.g., R&D, brand names, and market shares), using historical costs instead of market values for property, plant, and equipment, and off-balance sheet financings and contingencies. We predict a positive relation between *%LOSSES* and the market-to-book ratio (*MB*).

Table 6, Panel A shows the mean and median values for *E-R* and *MB* by decade. Consistent with prior research (e.g., Basu 1997), mean and median *E-R* increase over time, peaking during the 1980s, but still remaining relatively high in the 1990s. In contrast, *MB* increases between the 1950s and 1960s, dips dramatically in the 1960s, then rises precipitously over the next two decades. Comparing *E-R* and *MB* to *NOPACC* and to each other suggests that the individual accounting conservatism measures are picking up different aspects of financial reporting.[9]

Panel B of Table 6 contains the regression results; models 1–3 present the estimated coefficients on *E-R*, and models 4–6 show the coefficients on *MB*. As Panel B shows, the nonaccounting variables, *SMALL*, *BUSCYC*, and *CFOA*, are robust to each accounting conservatism metric. In all six regressions, the coefficients on the nonaccounting variables are statistically significant at conventional levels, with all but one variable significant at the 0.05 or 0.01 levels.

In contrast, we find very different statistical results for the accounting conservatism variables. In models 1–3, *E-R* is statistically positive at the 0.05 or 0.01 levels, indicating a significant association between *%LOSSES* and the *E-R* conservatism measure. In models 4–6, the estimated coefficients on *MB* are insignificantly different from zero, suggesting no relation between *MB* and accounting losses. Further, when we compare the coefficients in Table 6 to those in Table 4 (when we used *NOPACC* as our measure of accounting conservatism), we see that using *E-R* has no tangible effects on the estimated coefficients on *BUSCYC* and *CFOA*, but diminishes the coefficient on *SMALL*. Conversely, using *MB* has no discernible impact on the coefficients on *BUSCYC* and *SMALL*, but reduces the coefficients on *CFOA*. We find that the primary causes of these differences are reflected in the correlations between the independent variables. *E-R* and *SMALL* have a 0.63 correlation statistic, and *MB* and *CFOA* have a correlation coefficient of -0.42. Thus, consistent with Givoly et al. (2004) and Roychowdhury and Watts (2004), we find differences in accounting conservatism metrics. However, we also find that these differences contribute little to our interpretation of how nonaccounting factors relate to accounting losses.

[9] The Pearson correlation coefficient between *NOPACC* and *MB* is -0.18 ($p = 0.20$); the coefficient between *NOPACC* and *E-R* is -0.21 ($p = 0.14$); and the coefficient between *MB* and *E-R* is 0.03 ($p = 0.84$).

TABLE 6
Sensitivity Analysis for Alternative Accounting Conservatism Measures

Panel A: Alternative Conservatism Measures by Decade

	Earnings-Return Measure (*E-R*)		Market-to-Book Ratio (*MB*)	
Time Period	**Mean**	**Median**	**Mean**	**Median**
1951–1960	0.093	0.122	2.02	2.03
1961–1970	0.110	0.105	2.61	2.39
1971–1980	0.296	0.318	1.64	1.30
1981–1990	0.408	0.422	2.49	2.80
1991–2000	0.365	0.309	3.02	3.39

Panel B: OLS Regression of Frequency of Losses on Alternative Accounting Conservatism Measures, Percentage of Small Firms, Macroeconomic Productivity, and CFO

$$\%LOSSES_t = \beta_0 + \beta_1 ALTCNSV_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \varepsilon_t$$

Model	Intercept	*E-R*	*SMALL*	*BUSCYC*	*CFOA*	Adj. R^2
1	0.277***	0.130***	0.125*	−0.005**	−2.883***	93.6%
$\beta_3 = \Delta GDP$	(5.66)	(3.88)	(1.97)	(−2.44)	(−11.54)	
2	0.210***	0.082**	0.280***	−0.002***	−2.565***	94.1%
$\beta_3 = \Delta IP$	(5.71)	(2.59)	(4.21)	(−2.63)	(11.79)	
3	0.251***	0.111***	0.145**	0.035***	−3.003***	94.1%
$\beta_3 = RECESS$	(5.94)	(3.36)	(2.37)	(3.22)	(−12.72)	
	Intercept	***MB***	***SMALL***	***BUSCYC***	***CFOA***	**Adj. R^2**
4	0.236***	−0.007	0.382***	−0.005**	−3.327***	91.9%
$\beta_3 = \Delta GDP$	(3.55)	(−0.75)	(4.34)	(−2.17)	(−13.42)	
5	0.244***	−0.007	0.356***	−0.002**	−3.377***	91.9%
$\beta_3 = \Delta IP$	(3.69)	(−0.82)	(4.04)	(−2.28)	(−13.84)	
6	0.206***	−0.003	0.381***	0.040***	−3.457***	92.7%
$\beta_3 = RECESS$	(3.26)	(−0.37)	(4.58)	(3.23)	(−14.92)	

*, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, using a two-tailed test.

In Panel B, t-statistics are presented in parentheses.

Variable Definitions:

%LOSSES = the percentage of accounting losses reported for each year;

E-R = the estimated coefficient γ_2 from the following annual cross-sectional regression:

$$EPS_{it}/Price_{i-1} = \alpha_0 + \alpha_1 DUM_{it} + \gamma_1 Return_{it} + \gamma_2 (Return_{it}*DUM_{it}) + \varepsilon_{it},$$

where EPS_{it} is the earnings per share of firm *i* in fiscal year *t*, $Price_{i,t-1}$ is the price per share at the beginning of the fiscal year, $Return_{it}$ is the return of firm *i* over the 12 months beginning nine months prior to the end of the fiscal year *t*, and DUM_{it} is a dummy variable set equal to 1 if R_{it} is negative, and 0 otherwise;

MB = market price per share divided by book value per share at the end of the fiscal year;

SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;

BUSCYC = the U.S. business cycle, which we represent using three different measures. The National Bureau of Economic Research (NBER) divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth;

(*continued on next page*)

TABLE 6 (Continued)

RECESS = 1 if the year is included in an NBER recession period, and 0 otherwise;
Δ*GDP* = the annual percentage change in real gross domestic product. Real GDP is compiled monthly by the U.S. Department of Commerce;
Δ*IP* = the annual percentage change in total industrial production. It is compiled monthly by the Federal Reserve; and
CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations minus Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital.

How Important are Time-Series Trends?

The results reported thus far are based on regressions in which one level variable is regressed on several other level variables. As Table 4 shows, both the t-statistics on the coefficients as well as the adjusted R^2 value for the full regression are high. However, two of the independent variables, *SMALL* and *CFOA*, display either upward or downward trends, as does the dependent variable, *%LOSSES*. These trends raise several questions. First, are the high adjusted R^2 values reported in Table 4 related to these trends? Second, and perhaps more importantly, to what extent do these trends contribute to the documented rise in accounting losses over time? Finally, after controlling for the trends, what role does the business cycle play in explaining accounting losses?

We begin answering these questions by noting that the Durbin-Watson statistics for the regressions reported in Table 4 are significant at the 0.01 level, suggesting some degree of autocorrelation among the residuals. To control for the autocorrelation in the disturbances in the regression models and to remove possible trends in the data, we perform two separate tests. First, we transform the data into first differences and rerun the regression analyses on the transformed data. The regression model is:

$$\Delta\%LOSSES_t = \beta_0 + \beta_1\Delta NOPACC_t + \beta_2\Delta SMALL_t + \beta_3 BUSCYC_t + \beta_4\Delta CFOA_t + \varepsilon_t \quad (4)$$

where Δ is the one-year change. The subscript t refers to the change between years $t-1$ and t. Note that all variables except the business cycle variables (Δ*GDP*, Δ*IP*, and *RECESS*) have been differenced to take out their trend factors. We do not difference our business cycle variables, as they are already expressed as a change from the prior year.

Second, we incorporate a time trend factor, *TREND*, into the original levels regression, where *TREND* is defined as the calendar year minus 1950. The regression model is as follows:

$$\%LOSSES_t = \beta_0 + \beta_1 NOPACC_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \beta_5 TREND_t + \varepsilon_t. \quad (5)$$

The difference between Equations (4) and (5) reflects dissimilar statistical artifacts. Equation (4) corrects for the presence of a first-degree autocorrelation process in the dependent and independent variables. Including the trend factor in Equation (5) is a correct procedure for eliminating the presence of a time-stationary process.

Table 7 presents the summary statistics for each regression. In Panel A, Δ*%LOSSES* is significantly related to Δ*GDP*, Δ*IP*, and *RECESS* at the 0.01 level. Thus, the yearly change

TABLE 7
Examination of Time-Series Trends in the Data

Panel A: OLS Regression of Change in Percentage of Accounting Losses on Changes in Accounting Conservatism, Percentage of Small Firms, Macroeconomic Productivity, and CFO

$$\Delta\%LOSSES_t = \beta_0 + \beta_1 \Delta NOPACC_t + \beta_2 \Delta SMALL_t + \beta_3 BUSCYC_t + \beta_4 \Delta CFOA_t + \varepsilon_t$$

Model	Intercept	ΔNOPACC	ΔSMALL	BUSCYC	ΔCFOA	Adj. R^2
1	0.027***	0.035	0.370**	−0.006***	−0.316	32.1%
β_3 = Δ*GDP*	(4.33)	(0.19)	(2.01)	(−4.01)	(−0.93)	
2	0.019***	−0.107	0.249*	−0.004***	−1.10***	57.1%
β_3 = Δ*IP*	(5.79)	(−0.72)	(1.68)	(−7.19)	(−3.73)	
3	−0.003	0.035	0.410**	0.029***	−0.671*	30.0%
β_3 = *RECESS*	(−0.78)	(0.19)	(2.21)	(3.78)	(−1.86)	

Panel B: OLS Regression of Percentage of Accounting Losses Accounting Conservatism, Percentage of Small Firms, Macroeconomic Productivity, CFO, and a Trend Factor

$$\%LOSSES_t = \beta_0 + \beta_1 NOPACC_t + \beta_2 SMALL_t + \beta_3 BUSCYC_t + \beta_4 CFOA_t + \beta_5 TREND_t + \varepsilon_t$$

Model	Intercept	NOPACC	SMALL	BUSCYC	CFOA	TREND	Adj. R^2
1	0.142***	−0.575**	0.286***	−0.007***	−1.842***	0.002	94.9%
β_3 = Δ*GDP*	(3.21)	(−2.40)	(3.02)	(−3.24)	(−4.88)	(1.18)	
2	0.140***	−0.285	0.278***	−0.002***	−1.953***	0.002	94.7%
β_3 = Δ*IP*	(3.07)	(−1.24)	(2.85)	(−2.75)	(−5.02)	(1.27)	
3	0.125***	−0.449**	0.284***	0.041***	−2.065***	0.002	96.7%
β_3 = *RECESS*	(3.10)	(−2.13)	(3.23)	(4.41)	(−5.85)	(1.28)	

*, **, *** Indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, using a two-tailed test.
In Panel A, Δ indicates the change as the value in year *t* minus the value in year *t*−1.
In Panel B, t-statistics are presented in parentheses.

Variable Definitions:

%LOSSES = the percentage of accounting losses reported for each year;
NOPACC, nonoperating accruals = defined as total accruals (net income − cash flow from operations) minus operating accruals (Δaccounts receivable + Δinventories + Δprepaid expenses − Δaccounts payable − Δtaxes payable) plus depreciation and amortization expenses, all divided by beginning period total assets;
SMALL = the percentage of Compustat firms whose total assets are less than 25th percentile of the total assets of firms listed on the New York Stock Exchange for that year;
BUSCYC = the U.S. business cycle, which we represent using three different measures. The National Bureau of Economic Research (NBER) divides the U.S. economy into two economic environments: expansions and recessions. Expansions are from the trough to the peak of business growth and recessions are from the peak to trough of business growth;
RECESS = 1 if the year is included in an NBER recession period, and 0 otherwise;
Δ*GDP* = the annual percentage change in real gross domestic product. Real GDP is compiled monthly by the U.S. Department of Commerce;
Δ*IP* = the annual percentage change in total industrial production. It is compiled monthly by the Federal Reserve;

(*continued on next page*)

TABLE 7 (Continued)

CFOA = cash flows from operations divided by beginning period total assets. For the years 1987–2001, we use Compustat item no. 308. From 1971–1986, CFO is funds from operations minus Δworking capital (Δcurrent assets + Δ short-term debt − Δcurrent liabilities − Δcash). Prior to 1971, CFO is net income before extraordinary items plus depreciation expense plus Δdeferred income taxes − Δworking capital; and
TREND = the calendar year minus 1950.

in the percentage of losses is significantly related to the business cycle, suggesting that changes in the frequency of accounting losses are exaggerated or attenuated by the business cycle. Δ*%LOSSES* is also positively and significantly associated with Δ*SMALL*, the change in the percentage of small firms in the Compustat database. Thus, as relatively more small firms are added (or removed) each year from Compustat's coverage, the percentage of accounting losses increases or decreases as well. For the regressions with Δ*IP* and *RECESS,* Δ*%LOSSES* is significantly negatively related to the annual change in *CFOA*, supporting our earlier finding that accounting losses are inversely related to cash flows from operations. The main difference between the levels-based and changes-based regressions, however, is in the significance levels for *NOPACC vis-à-vis* Δ*NOPACC*. Whereas in Table 4, *NOPACC* is significantly negative for two of the three levels-based models, none of the coefficients on Δ*NOPACC* is significantly different from zero in the changes-based models. Thus, over time, there appears to be no systematic relation between changes in the frequency of accounting losses and changes in the degree of accounting conservatism, *ceteris paribus*.

The adjusted R^2 values for the models are 32.1 percent, 57.1 percent, and 30.0 percent, respectively. Although the explanatory power for the changes regressions are lower than that for the levels regressions, they still suggest that a significant amount of variation in the change in the percentage of losses is picked up by changes in nonaccounting variables. The Durbin-Watson statistics for each regression are insignificantly different from zero, implying that the autocorrelation factors have been removed. The insignificant coefficients on Δ*NOPACC* and the reduced significance levels on Δ*SMALL* and Δ*CFOA* suggest that much of the time-series correction is coming from these three factors.

Table 7, Panel B contains the regression results for the levels-based equation with a time-trend factor included as an additional independent variable. The estimated coefficient on the trend factor is insignificantly different from zero (t-statistics range from 1.18 to 1.28) for the three regressions. In addition, the interpretation of the independent variables with respect to their relation to *%LOSSES* is unaffected by the inclusion of a time-trend factor. However, consistent with the changes-based regressions, the t-statistics on *SMALL* and *CFOA* drop dramatically from those reported in Table 4. For example, for the regression using Δ*GDP* to measure macroeconomic productivity, the t-statistic for *SMALL* drops from 6.55 in Table 4 to 3.02 in Table 7. Similarly, the t-statistic for *CFOA* declines from −8.82 to −4.88. In contrast, there is little to no change in the t-statistics for *NOPACC* or for the business cycle variables. Thus, as with the changes-based analysis, adding the trend factor corrects for the time-series properties of the *SMALL* and *CFOA* variables.

VII. WHY DO SMALL FIRMS REPORT MORE LOSSES?

Our results are consistent with the view that that the increasing percentage of small firms on Compustat is a major reason for the increase in the percentage of firms reporting losses over time. In our hypothesis section, we posited several reasons behind this phenomenon: small firms are less diversified, they are more risky, and they are more likely to be in the early or later stages of their life-cycle. In this section, we investigate the associations among small firms, losses, and these variables.

First, we posit that small firms are less diversified. If small firms are less diversified, then they are limited in their abilities to offset losses from one line of business against gains from another line of business. One direct way to measure this is to compare the number of reporting segments between small and other firms. Firms with only one segment are the least able to offset losses. We therefore predict that small firms are more likely to be single-segmented. We also predict that the likelihood of reporting a loss is higher for firms with a single business segment.

Second, we propose that small firms have more volatility in their operations and, therefore, are more likely to report losses in one year and profits in another year. In contrast, larger firms have more smoothed performances in their operations and consequently are less likely to report losses in any given year. One way to measure operations volatility is to examine the idiosyncratic component of the firm's variance of daily stock returns over the year. Campbell et al. (2001) specifically link idiosyncratic stock volatility to the variance of cash flow shocks. We predict that small firms have higher idiosyncratic risk than larger firms and, consequently, the likelihood of a firm reporting a loss is positively related to its idiosyncratic risk over time.

Third, we posit that small firms are more likely to be in the beginning or ending stages of their life-cycles. Fama and French (2004) show that from 1980–1989, 89.7 percent of new common stock listings (IPOs and non-IPOs) were in the 0 to 20th percentile of market equity, based on all stocks trading on the NYSE in the month of the listing. From 1990–2000, 72.0 percent of new listings were in the 0 to 20th percentile of market equity. Fama and French (2004) also demonstrate that the percentage of new listings reporting accounting losses in their first year was 44.2 percent in 1980–1989 and 44.2 percent in 1990–2000 for IPOs, and was 44.6 percent in 1989–1989 and 51.6 percent in 1990–2000 for non-IPO new listings. Taken together, their results suggest that many small firms are in the beginning of their life-cycle and that newly listed firms have a high probability of showing an accounting loss in its listing year. We therefore propose that firm size is positively related to it being a new listing and that the likelihood of a firm reporting an accounting loss is positively related to whether it is a new listing. We also hypothesize that small firms in the earlier stages of development invest more heavily in long-term assets and research and development than larger firms and so are less likely to be reporting positive cash flows from operations and/or positive net income. We therefore posit that small firms will have more negative cash flows from investing (CFI) (with R&D included) than larger firms and that the likelihood of a firm reporting an accounting loss is negatively related to its investing cash flows.

Barth et al. (1998) show that firms delisting from Compustat because of bankruptcy between 1975–1993 have, in the year prior to delisting, mean assets of $133.85 million and mean net income of −$67.93 million. They also demonstrate that over 1988–1993, financially healthier firms have substantially higher market values of equity and net income than firms with lower financial health. Their findings suggest that many small firms are in the end of their life-cycle and that these firms are more likely to report losses in their delisting year. Consequently, we posit that small firms are more frequently delisted and that accounting losses are related to whether a firm delists.

Data on the number of business segments are from Compustat's segment detail file. *SEG1* is a dummy variable equal to 1 if the firm has only one business segment, and 0 otherwise. Segment data are available from 1985 onward. Idiosyncratic risk (*IDVOL*) is the standard deviation of the residual from a firm-specific regression of daily returns on the equally weighted CRSP market portfolio returns, estimated annually. *NEW* is a dummy variable equal to 1 if the firm appears for the first time in year *t* on the Compustat tape, and 0 otherwise. *DELIST* is a dummy variable equal to 1 if the firm's history on the Compustat research tape ends at year *t*, and 0 otherwise. *CFI* is cash flows from investing (annual Compustat item no. 311) minus research and development expense (annual Compustat item no. 46), divided by total assets. These data are available from 1987 onward.

We perform both univariate and multivariate analyses. Because our data on CFI begin in 1987, we limit our analysis to firms listed on Compustat in 1987–2001. Since this gives us only 15 years of data, we do not use annually aggregated data; instead, we use firm-specific data. Thus, *SMALLFIRM* is a dummy variable equal to 1 if the firm is at or below the 25th percentile of NYSE assets for that year, and 0 otherwise. *LOSSFIRM* is a dummy variable equal to 1 is the firm has negative net income in that year, and 0 otherwise.

Table 8, Panel A presents the univariate tests on differences in firm characteristics for small/large firms and for loss/profit firms. First, we show that small firms are significantly more likely to report losses than large firms (46.58 percent versus 18.58 percent), or, alternatively, loss firms are significantly more likely to be small in size than profit firms (74.05 percent versus 42.75 percent). In addition, the Chi-square statistic from a 2×2 table of size versus profitability is 6,257.8, which is highly significant (the cut-off for a Chi-square with one degree of freedom is 15.13 at the 0.0001 level of significance). Thus, the relationship between small firm size and the tendency to report losses is unequivocal.

As Panel A of Table 8 also shows, small firms are significantly more likely to have only one business segment, have greater idiosyncratic risk, have proportionally higher numbers of delistings, and have more negative *CFI* than larger firms. Specifically, on average, 79.08 percent of small firms have one business segment compared to 56.98 percent of large firms (t-statistic for differences between means = 65.45, significant at < 0.001 level). Small firms' idiosyncratic risk is 0.0536, compared to 0.0264 for large firms (t-statistic = 163.47, significant at the < 0.001 level). *CFI* is -0.1340 for small firms, against -0.1120 for large firms (t-statistic = -17.92, significant at the > 0.001 level). On average, 7.12 percent of small firms delist compared to 4.93 percent of large firms that delist (t-statistic = 12.35, significant at the > 0.001 level). On average, however, there is no difference between the percentages of new listings between small and large firms (t-statistic = 1.55, insignificant at the 0.10 level). Thus, small firms are less diversified, more risky, have more negative levels of investing cash flows and are more likely to be at the end of their life-cycles than larger firms. Comparing median values produce similar results and conclusions.

As the right side of Table 8, Panel A shows, there are similar mappings in firm characteristics for loss firms *vis-à-vis* profit firms. The percentage of loss firms with only one reporting segment is significantly greater than the percentage of profit firms, -75.66 percent against 65.27 percent (t-statistic = 28.43, significant at the > 0.001 level).[10] Loss firms' idiosyncratic risk is 0.0583 compared to 0.0322 for profit firms (t-statistic = -122.45, significant at the > 0.001 level).[11] Loss firms invest more heavily than profit firms; *CFI* is

[10] We also examine the number of segments itself and find similar results. Small firms have, on average, 1.35 business segments, whereas larger firms have, on average, 2.02 business segments (t-statistic = 75.88). Loss firms, on average, have 1.47 business segments and profit firms have 1.76 business segments (t-statistic = 33.81). We also note, however, that during our time period, there was a change in reporting standards regarding segment reporting. SFAS No. 131 became effective for fiscal years beginning on or after January 1, 1998. Two outcomes of the change were that more firms reported in greater numbers of lines of businesses and that fewer firms reported just one business segment (see Street et al. 2000). These results work against our hypothesis since the percentage of firms reporting losses after 1997 rose but the percentage of firms reporting one segment dropped.

[11] This finding complements Ertimur (2005), who finds that loss firms have higher levels of information asymmetry than profit firms.

TABLE 8

Differences in the Characteristics of Small versus Large and Loss versus Profit Firms (1987–2001)

Panel A: Univariate Differences in Firm Characteristics

Variable	Statistic	Small Firms (n = 38,015)	Large Firms (n = 33,397)	Test Statistic of Difference between Means/Medians/%	Loss Firms (n = 23,912)	Profit Firms (n = 47,500)	Test Statistic of Difference between Means/Medians/%
LOSS	Proportion	0.4658	0.1858	77.81***			
SMALL	Proportion				0.7405	0.4275	77.81***
SEG1	Proportion	0.7908	0.5698	65.45***	0.7566	0.6527	28.43***
IDVOL	Mean	0.0536	0.0264	163.47***	0.0583	0.0322	122.45***
	Median	0.0473	0.0226	157.56***	0.0522	0.0275	127.08***
CFI	Mean	−0.1340	−0.1120	−17.92***	−0.1427	−0.1141	−18.33***
	Median	−0.0955	−0.0890	−6.62***	−0.0886	−0.0926	0.92
NEW	Proportion	0.0752	0.0722	1.55	0.0701	0.0756	−2.68**
DELIST	Proportion	0.0712	0.0493	12.35***	0.0835	0.0496	16.55***

Panel B: Multivariate Probit Analysis of Firm Size and Accounting Losses on Firm Characteristics (n = 71,412)

$$Pr(Variable_{it}) = \beta_0 + \beta_1 SEG1_{it} + \beta_2 IDVOL_{it} + \beta_3 CFI_{it} + \beta_4 NEW + \beta_5 DELIST_{it} + \varepsilon_{it}$$

Dependent Variable	Model	Intercept	*SEG1*	*IDVOL*	*CFI*	*NEW*	*DELIST*
SMALLFIRM	Pooled	−1.6886	0.4826	36.6054	−0.2885	0.2252	0.0309
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.1727)
	Fama-MacBeth	−1.7941	0.4182	40.5029	−0.4917	0.1722	0.0527
		(0.0001)	(0.0001)	(0.0001)	(0.0152)	(0.1910)	(0.0893)
LOSSFIRM	Pooled	−1.6505	0.0815	24.9768	−0.5901	0.1146	0.2201
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
	Fama-MacBeth	−1.7254	0.0727	28.1834	−0.6240	0.1688	0.2428
		(0.0001)	(0.0168)	(0.0001)	(0.0002)	(0.0391)	(0.0018)

(*continued on next page*)

TABLE 8 (Continued)

*, **, *** Indicate significance at the 0.05, 0.01, and 0.0001 levels, respectively.

Variable Definitions:

SMALLFIRM = indicator variable that equals 1 if the total assets of the firm are less than the 25th percentile of total assets for NYSE firms in a given year, and 0 otherwise;

LOSSFIRM = indicator variable that equals 1 if net income is negative, and 0 otherwise;

SEG1 = indicator variable that equals 1 if the firm has a single business segment, and 0 otherwise;

IDVOL = idiosyncratic component of daily stock return volatility, estimated each firm-year by regressing daily returns on the CRSP equally weighted market return and computing the standard deviation of the residuals;

CFI = cash flows from investing activities minus R&D expenses, divided by total assets;

NEW = indicator variable that equals 1 if the firm appears for the first time on the annual industrial Compustat tape, and 0 otherwise; and

DELIST = indicator variable that equals 1 in the last year that the firm appears on the Compustat Research tape.

−0.1427 for loss firms and −0.1141 for profit firms (t-statistic = 18.33, significant at the > 0.001 level). On average, 8.35 percent firms delist in a loss year compared to 4.96 percent of firms that delist in a profitable year (t-statistic = 16.55, significant at the > 0.001 level). Comparing medians produce similar results and conclusions, with only median *CFI* not being statistically different from each other. Thus, the same characteristics that are associated with small firms also describe loss firms.

In Panel B of Table 8, we present multivariate probit analyses of both *SMALLFIRM* and *LOSSFIRM* on the same set of firm characteristics. Because firms appear repeatedly from year to year, we show both pooled regression and Fama-MacBeth coefficients and test statistics. As Panel B shows, the probit models yield similar results to the univariate analyses. *SMALLFIRM* is significantly and positively related to *SEG1* and *IDVOL* and is significantly and negatively related to *CFI*. The evidence on *NEW* and *DELIST* is mixed, with *NEW* being significantly positive for the pooled-sample results only and *DELIST* being significantly positive for the Fama-MacBeth results only. *LOSSFIRM* is significantly and positively related to *SEG1*, *IDVOL*, *NEW*, and *DELIST* and is significantly negatively related to *CFI*.

In summary, we provide some intuition behind the finding that small firms are more likely to report losses than larger firms. We show that small firms are less diversified, have higher idiosyncratic risk, more negative levels of CFI (including R&D expenditures), and are more likely to be at the end of their life-cycle than larger firms. We also show that firms with similar characteristics are more likely to record an accounting loss for the year than a profit.

VIII. SUMMARY AND CONCLUSIONS

This paper examines accounting and nonaccounting fundamentals behind accounting losses over the 50-year period 1951–2001. We examine four factors: accounting conservatism, Compustat coverage of small firms, real firm performance as measured by operating cash flows, and macroeconomic productivity. Consistent with previous studies, we find a positive relation between the frequency of firms reporting negative income over time and accounting conservatism, where accounting conservatism is defined as nonoperating accruals (Givoly and Hayn 2000). However, in the overall scheme of our analyses, accounting conservatism appears to play a relatively small role in determining the frequency of losses. Instead, we find accounting losses to be significantly related to the nonaccounting factors we examine. Our results also hold when relating ROA to the same factors and are robust to alternative definitions of accounting conservatism and business cycle variables.

Our study makes two contributions. First, we expand on extant research that examines the determinants of accounting losses. Consistent with prior studies, we document a significant association between losses and accounting conservatism. Our contribution arises by demonstrating that nonaccounting factors, most notably firm size and the business cycle, also play significant roles in explaining the incidence of accounting losses over time.

Second, our study has implications regarding the usage of accounting loss information. Accounting income, and losses in particular, are relevant for determining security valuations, bankruptcy probabilities, and abandonment options. Accounting earnings and losses are inputs in contracting, shareholder litigation, dividend policy, market-listing standards, and regulatory inquiries. By improving our understanding of how losses are generated, users and practitioners can better interpret the meaning of accounting losses.

The study has several limitations. First, our use of cash flows from operating activities as our measure of real firm performance may be imperfect due to manipulation of cash flows. The recent cases of WorldCom and Parmalat demonstrate that cash flow manipulation is a real possibility, and Roychowdhury (2004) finds empirically that firms manage earnings through manipulation of real activities that affect cash flows. However, because it appears that this phenomenon is relatively new, our use of a long time-series of data from 1951–2001 should mitigate its effects. In addition, Roychowhury's (2004) findings suggest a negative relation between accounting losses and cash flows, not a positive one, as we document. Nonetheless, the possibility of cash flow manipulation should be kept in mind when interpreting the results.

Second, we take an aggregate, market-wide approach to examining the fundamentals of accounting losses. While this research design choice has the advantage of allowing us to incorporate macroeconomic conditions into our analysis, which is one of our primary objectives, it precludes analyses and inferences regarding firm-specific variables, for example, interactions between accounting losses and firms' decisions on how to finance its investments, its dividend policy, changes to its labor force, etc. We leave these analyses to future studies.

Last, while our results clearly indicate that nonaccounting factors are significant determinants of reported accounting losses, future research might more directly address the implications of these findings. For example, should the use of loss information in security valuation, bankruptcy prediction, or credit rating determinations be conditioned on current macroeconomic productivity, firm size, or real firm performance? This is one possible avenue of inquiry that future research might explore.

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