Are sin stocks paying the price for their accounting sins?

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Abstract

A recent study by Hong and Kazpereczyc (2005) finds that sin stocks – publicly-traded stocks in the gaming, tobacco, and alcohol industries are neglected by the stock market despite generating abnormal stock returns. We examine a rational explanation for their findings. Are the excess returns and investor neglect of sin stocks attributable to higher levels of information risk arising from poor financial reporting quality? Contrary to expectations, we find that sin firms exhibit better financial reporting quality along three dimensions: earnings and accrual persistence, predictability of earnings for future cash flows, and timely loss recognition. Our results are more consistent with a supply-side argument, whereby sin firms have high financial reporting quality to attract a wider investment and analyst base. Despite superior returns and financial reporting quality, investors are willing to bear a financial cost in order to comply with societal norms and reflect non financial tastes in their portfolio by neglecting sin stocks.

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1. Introduction

In recent times, socially responsible investing has become a niche of its own in determining investors’ portfolio decisions. Socially responsible mutual funds have experienced considerable growth, both in the number of funds as well as the amount of assets under management over the last decade. There are over 200 socially screened mutual funds and about 10% of the total assets under management in the U.S. involve socially responsible investing (Social Investment Forum 2006). The scope of socially responsible investing varies from investing in morally and ethically sound companies (e.g., investing in environmentally conscious firms) to avoiding investments in companies that produce and market perceived unethical goods (e.g., tobacco or alcohol products). Whether these socially responsible investments outperform investments that are not otherwise constrained by ethical norms has been the subject of debate in the recent academic literature. Research findings (e.g., Hamilton, Jo and Satman (1993); Geczy, Stambaugh and Levin (2003)) suggest that socially responsible funds do not earn excess returns beyond conventional mutual funds, and constraining the investment strategy to incorporate social objectives can be costly.

While the effect of social norms on economic behavior has been studied in the context of wage discrimination (Becker 1957), research on the effects of social norms on the stock market has been of fairly recent origin. Hong and Kacperczyk (2005) examine the investment performance and the environment of a sample of “sin” stocks shunned by investors because they engage in morally questionable productive endeavor (e.g., firms engaging in the production of alcohol and tobacco or offering services in gaming and sex). Consistent with their predictions, they find that sin stocks are neglected by the market as they have lower levels of institutional
ownership and analyst coverage. More importantly, Hong and Kacperczyk (2005) find that sin stocks behave more like value stocks in that they tend to earn abnormal returns after accounting for well-known determinants of expected returns such as the market beta, book to market, size, and momentum. They attribute the excess returns to a neglect effect in that these firms have lower valuation relative to fundamentals because of limited risk-sharing (Merton 1987). They conclude that, despite higher stock return performance, sin stocks are ignored because of social norms rather than litigation exposure, which is inconsistent with portfolio theory.

In this study, we argue that are other dimensions of risk that prompt investors to neglect and discriminate against sin stocks aside from the motives of discriminatory tastes in adhering to societal norms. Specifically, we explore the possibility that the excess returns on sin stocks and institutional investors’ neglect of such stocks may be explained by the underlying financial reporting quality of these sin firms. Some anecdotal evidence exists that sin firms are suspect of unethical accounting practices. In 2003, tobacco maker R.J. Reynolds was subject to an SEC probe for its aggregation of selling, general, and administrative expenses in its financial statements (O’Connell, 2003). The SEC took issue with the fact that RJR was aggregating product liability costs into the selling, general, and administrative costs for purposes of its financial statements. If poor earnings quality is pervasive among sin firms, it can have ramifications for their perceived risk and investor following.

Recent theoretical and empirical work (e.g., Lambert, Leuz and Verrecchia 2005; Francis, LaFond, Olsson, and Schipper 2004) examine how accounting information and, in particular, the

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1 Given the nature of the sin stocks’ operations, the expectation may be that all characteristics of these firms are suspect, in particular when it comes to earnings management and financial reporting quality.

2 This does not necessarily imply that firms in socially responsible funds that neglect sin stocks have ethical accounting practices. For example, Pax High Yield Fund, a Socially responsible mutual fund, invested in notes issued by Adelphia Communications Corp whose executives were arrested and charged with personal fund use (O’Brian, 2002). Adelphia, a cable provider, passed Pax’s ethical screens because of its stance against carrying adult entertainment channels. Investment in Tyco by Calvert Social Investment Equity Fund is another example of socially responsible investing not necessarily screening for accounting ethics (O’Brian, 2002).
reporting quality affects expected returns and the cost of capital. Francis et al. (2004) show that the quality of accounting attributes is negatively related to the cost of equity. That is, firms with better accounting information quality and hence, lower information risk, have lower costs of equity. Thus, we hypothesize that the excess returns obtained for sin stocks reflect higher expected return due to lower financial reporting quality.

To test this hypothesis, we begin by examining the extent to which prices of sin stocks reflect the information contained in an accounting performance measure, namely earnings. Consistent with the interpretation in Hong and Kacperczyk (2005) that sin stocks represent neglected stocks, we find that the earnings response coefficients for sin stocks are substantially lower than other firms in similar industry classifications. However, such lower earnings response coefficients could be a manifestation of poor earnings quality rather than a systematic under-reaction to changes in firm fundamentals. So, we conduct a series of tests to disentangle these alternative explanations.

We examine three measures of financial reporting quality: persistence of earnings and its accrual component, predictive ability of earnings for future cash flows, and timeliness of loss recognition in earnings. We use other non-sin firms in the same two-digit SIC code as the benchmark for comparing earnings quality. We find that, compared to control firms, sin firms have i) earnings which are better predictors of future cash flows, ii) greater accrual and earnings persistence, and iii) earnings that recognize losses in a more timely fashion. Thus, our collective findings are inconsistent with the hypothesis that sin firms have higher future realized returns because they have greater information risk. Rather, our evidence is consistent with sin firms

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3 We also consider Fama and French (1997) industry classification as an alternative benchmark and our inferences are unaltered.
being neglected and discriminated against for social norms reasons, despite the fact that such firms have better quality information in the financial statements.

Our findings are also consistent with sin firms employing financial reporting quality as a method to attract a wider investor base and analyst following in an effort to reduce information asymmetry, adverse selection, cost of capital, and increase liquidity. Anecdotal evidence indicates that sin firms also undertake alternative methods to detract from the adverse association by, for example, undergoing significant chartable giving and recycling. For example, Altria (Philip Morris) has donated $1 billion in cash and food donations in the past decade to various charitable organizations (Waxler, 2004). In addition, Anheuser-Busch recycles more than 97% of the waste it generates making it the world’s largest recycler of used aluminum cans (Ahrens, 2004). However, it is not clear that such attempts by sin firms to be responsible in other dimensions have been successful in attracting the attention of capital market participants. In sum, Becker’s (1957) theory of discrimination concludes that agents bear a financial cost to avoid interacting with another group of people, i.e. they pay for their tastes. Our findings, along with those of Hong and Kacperczyk (2005), suggest that the desire to avoid investment and coverage of the sin firms by capital market participants is sufficiently overwhelming, even in the presence of superior market returns, financial reporting quality, and these other conscious attempts on the part of sin firms to counteract their poor perception.

The paper proceeds as follows. Section 2 discusses related literature on social norms and presents our hypothesis. In Section 3 we provide details on the sample selection procedure and present descriptive statistics. Section 4 describes the research design and discusses the empirical findings, and Section 5 concludes.
2. Related Research on Social Norms and Hypothesis

Social norms are a significant “driving force” of individual behavior (Kubler, 2001). In the economics literature, an early inquiry into the impact of social norms on economic behavior was in the context of the labor market. For example, in Becker’s (1957) taste-based model of discrimination, agents (employers) have discriminatory tastes based on the societal norms and refrain from entering into contracts with (hiring) a particular class of people based on race or gender, even if it meant incurring financial costs for doing so. Akerlof (1980) examines social norms in an unemployment setting; despite the fact that social norms can be costly to its followers, they continue to exist because of the perceived loss of reputation for diverting from the social norm. Thus, social norms are not outcome oriented and do not necessarily benefit anyone (Elster, 1989). Furthermore, in an examination of social norms following Akerlof’s (1980) model, Kubler (2001) discovers that regulation of social norms is advocated when a large proportion of the population follows the social custom (bandwagon effect).

In the context of capital markets, adherence to social norms takes the form of socially responsible investing, and represents a niche type of investing where investment decisions incorporate social, ethical, and environmental concerns. Socially responsible investment is a term that “refers to the practice of directing investment funds in ways that combine investors’ financial objectives with their commitment to social concerns such as social justice, economic development, peace or a healthy environment” (Haigh and Hazelton, 2004). The idea is that investors with a socially responsible investing philosophy can somehow affect the practices of the firms in which they invest. Improving the practices of the firms is consistent with social norms improving “the efficiency of the economic system (in the broad sense of satisfaction of individual values)” (Elster, 1989). Mutual funds with an explicit socially responsible investing
objective represent a nontrivial proportion of total assets under fund management (Geczy et al. 2005). In addition to explicit objectives, mutual funds and pension funds may have implicit incentives not to invest in firms that engage in morally unacceptable (sinful) productive activities. For example, the Calvert Social Investment Fund does not invest in firms with operations in South Africa, weapons manufacturers, or nuclear power firms (Hamilton et al. 1993).

Whether the investing constraints imposed by investors or funds that have a socially responsible criterion come at the expense of lower stock returns has been the subject of debate in the finance and economics literature. Numerous studies (e.g., Bello 2005; Hamilton et al. 1993; Sethi 2005; Geczy at al. 2005) have examined the issue of whether socially responsible investment results in different returns than unrestricted investment. Lower investment returns are predicted by opponents of socially responsible investing because the number of investment opportunities is reduced; a smaller investment set generates lower expected risk-adjusted returns (Phillips, Hager & North Investment Management Ltd.). In contrast, proponents argue that investing in companies selected on ethical and social standards are considered a better investment overall, and as such earn higher returns because imposition of such standards eliminates poor performing firms. That is, firms that embrace socially responsible values will deliver better financial performance and consequently, any loss in portfolio efficiency due to imposing the constraint on the investment set will be offset by superior performance of the socially responsible firms. Most of these studies find that socially responsible investments result in loss of portfolio efficiency and hence, under perform relative to conventional portfolios. Regardless of the stock return performance, Sethi (2005) argues that socially responsible investing philosophy is critical for pension funds and other long-term institutions because of the
likelihood of longevity and survival of these socially responsible firms. In addition to the lack of superior returns for socially responsible portfolios documented in the prior literature, Geczy et al. (2005) explore the cost to an investor by constraining investments solely in socially responsible mutual funds. They report that an investor who believes in a multifactor asset pricing model incurs a cost of over 30 basis points per month by imposing the constraint of only investing in socially responsible funds.

Hong and Kacperczyk (2005) offer further evidence on the potential downside of having an investment philosophy that adheres to social norms by focusing their attention to the investment environment of sin stocks. Sin stocks are public companies that are involved in morally unacceptable productive activities and services, i.e., firms involved in the production of tobacco and alcohol, and firms that offer services in gaming and sex. They document that these firms have lower institutional ownership and analyst coverage, consistent with the notion that such stocks are eschewed by an important group of capital market participants. Furthermore, these sin firms behave like value stocks and outperform the market after controlling for factors that determine expected returns. Collectively, the evidence suggests that sin companies’ stock are both neglected and under valued. Hong and Kacperczyk (2005) explore two possible explanations for the neglect and under valuation. They explore whether the under valuation of sin firms is due to a “neglect effect” arising from investor preference for adhering to social norms, or whether it is due to rational pricing from litigation risk that these companies face. For example, tobacco companies are well known for their significant exposure to litigation risk. Hong and Kacperczyk (2005) conclude that the neglect effect due to social norm justifications dominates litigation risk in explaining the returns obtained for sin stocks.
We explore yet another rational explanation for the neglect of sin stocks. We posit that certain other dimensions of risk may motivate investors to neglect sin stocks. Specifically, we posit and test the hypothesis that the neglect of sin stocks by institutional and individual investors may be due to lower financial reporting quality of these sin firms. Recent theoretical work develops models to demonstrate how firm-specific information properties, i.e., financial reporting and disclosure environment, affect expected returns and the cost of capital. Easley and O’Hara (2004) use a multi-asset rational expectations framework with informed and uninformed investors to show that uninformed investors demand a premium or require higher returns (cost of capital) as compensation for trading with informed investors. Uninformed investors face a disadvantage due to information risk because informed investors are better able to shift their portfolio weights to take advantage of their private information. Such risk is non-diversifiable and thus priced. The extent of information risk in a firm, i.e., the extent to which investors are uninformed about future cash flows, is influenced both by the amount of private information with informed investors, as well as the precision of public information.

Lambert et al. (2005) take a different approach to show how accounting information manifests itself in cost of capital. They show that the quality of accounting information influences a firm’s cost of capital in two ways: i) a direct effect arising from the quality of accounting information, which impacts the investors’ assessment of the distribution of future cash flows, and ii) indirect effect from the influence of information quality on a firm’s real decisions that in turn, influences the stock’s expected value and the cost of capital. Under both effects, higher information quality unambiguously reduces the cost of capital.

Thus, both Easley and O’Hara (2004) and Lamber et al. (2005) predict that firms with more information risk (or lower reporting quality) have higher cost of capital. Francis et al.
(2004, 2005) test this theoretical prediction by examining the relation between cost of capital and several proxies for accounting quality such as accruals quality, persistence, predictability, smoothness, value relevance, timeliness and conservatism. When these proxies are considered individually, they find evidence consistent with a negative (positive) relation between information quality (risk) and the cost of equity capital. In sum, based on these theoretical and empirical findings, we hypothesize that the excess returns obtained for sin stocks may reflect higher expected return (or higher cost of capital) due to lower financial reporting quality. In the sections that follow, we examine whether sin firms have specific financial reporting characteristics that are consistent with higher information risk, prompting investor neglect and higher costs of capital.

3. Sample Selection and Descriptive Statistics

Our first objective in the sample selection process is to identify a set of sin stocks. Since there is no formal definition of sin stocks, we begin with the set of sin stocks identified by Hong and Kacperczyk (2005) that are in the tobacco, alcohol and gambling industries. Firms in these industries are considered to be indulging in sinful activities, because they produce goods or provide services that are considered morally reprehensible or represent an offense against religious or moral law. Hong and Kacperczyk (2005) compile their sample of sin stocks as follows. First they include all firms in SIC codes 2100-2199 as part of the tobacco group and firms in the SIC codes 2080-2085 as firms in the alcohol group. Because firms in the gambling industry are not separately identifiable using the SIC classification scheme, they use the NAICS classification which explicitly identifies stocks in the gaming industry, i.e., stocks in the NAICS codes of 7132, 71312, 713210, 71329, 713290, 72112, and 721120. In addition to these firms
exclusively identified by the SIC or NAICS classification scheme, they use COMPUSTAT segment data to include firms that have segments operating in any of these SIC or NAICS groups.

Hong and Kacperczyk (2005) exclude sex stocks because there are very few publicly traded firms with heavy operations in sex.\(^4\) We add stocks classified by Ahrens (2004) as belonging to the sex industry, i.e., firms with material operations in sex and pornography, which include Playboy Enterprises, Rick’s Cabaret International Inc., Church & Dwight Co Inc., and New Frontier Media Inc.\(^5\) The original list of sin stocks in Hong and Kacperczyk (2005) is composed of 184 unique firms, which we augment with four additional sex firms, to create a starting point of 188 unique sin firms.

For this sample we obtain stock returns data from the CRSP database, and all financial statement information from the COMPUSTAT database. We restrict our analysis to the period commencing from 1988 to 2003 because information about accruals and operating cash flows available from the statement of cash flows (SFAS 95) are only available starting from 1988.\(^6\) After deleting firm year observations where financial statement and return data are unavailable from CRSP and COMPUSTAT, we are left with 779 firm year observations for our sin sample comprising 111 unique firms.

We then obtain a sample of benchmark firms (control firms) representing all firms in the same two-digit SIC codes as that of the sin firms.\(^7\) Table 1 presents the industry representation of the sin and control sample at the two-digit SIC code level. Notice that firms in the four sin

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\(^4\) Hong and Kacperczyk (2005) also exclude defense stocks because there is some debate about the sin classification of these firms. Accordingly, we also exclude these firms.

\(^5\) To the extent that sex firms have material operations in non sex industries, this will bias against finding a relation between financial reporting quality and sin stocks. Furthermore, all empirical inferences remain unchanged if these firms are excluded.

\(^6\) Over twenty of the firms in the Hong and Kacperczyk’s (2005) sample are eliminated because they are categorized as sin firms during a period prior to 1988 and hence precluded from being part of our sample.

\(^7\) All empirical inferences remain unchanged when we employ a control group based on the Fama-French 49 industry classifications.
industries (alcohol, tobacco, gambling and sex) are spread over several two-digit SIC codes. Thus, there is a broad sample of control firms available for comparison with firms in the sin industries, except for the tobacco industry. Tobacco firms fall under a unique two-digit SIC code (code 21) and hence, do not have any control firms from the same two-digit SIC code. The largest representation of sin firms is in the amusement and recreation services (56 firms) and food (25 firms) industries. In all, we have a control sample of 2,441 unique firms with 13,734 firm year observations.

Table 2 provides descriptive statistics of the variables used in the empirical analyses for both the sin and control groups. Sin stocks are larger, have lower sales growth, and are characterized by lower market to book ratios (mean of 2.78 vs. 3.23 for control group), consistent with the idea that sin stocks act like value stocks. Furthermore, sin stocks are less risky than the control group, with a mean beta of 0.88 (median of 0.83), whereas the control group has a mean beta over one, at 1.08 (median of 1.02). We also find that leverage is significantly higher on average for sin firms (0.37) relative to control firms (0.23). This is consistent with Hong and Kacperczyk (2005), who find that sin firms finance their operations with relatively more debt than non-sin firms.

With respect to descriptive statistics on the earnings attributes, several points are noteworthy to mention. First, sin firms have on average, higher annual earnings per share relative to control firms. Moreover, much of the earnings are in the form of operating cash flows as evidenced by higher cash flows as a percentage of total assets (7.7% for sin firms vs. 1.6% for control firms). The accrual component of earnings as a percentage of total assets is on average much lower for sin firms (−6.9%) relative to the control counterpart (−5.7%). This might, at first blush, suggest that sin firms may be more conservative in their accounting relative to control
firms. However, such an interpretation may be premature because the higher negative accruals for sin firms may arise because of higher depreciation from a large tangible asset base for such firms. A comparison of the descriptive statistics for depreciation and property plant and equipment suggests that this is indeed the case. The amount of depreciation and property, plant and equipment as a percentage of average assets is significantly higher for the sin firms relative to treatment firms.

4. Research Design and Empirical Findings

Before proceeding to the discussion of the ways we assess differences in the quality of accounting information between sin firms and their control counterparts, we provide further evidence of neglect of sin firms for our sample spanning the period 1988-2003. To accomplish this, we begin by examining whether there is a differential price response to earnings information of sin and control firms. If the earnings response coefficient (ERC) is sufficiently lower for sin stocks, it suggests either uninformative earnings (expectations that they are biased), or neglect by market participants.

We estimate the following empirical specification to examine the ERC of sin firms relative to control firms:

\[
CAR = \beta_0 + \beta_1 + \beta_1 \Delta\text{EARNMV} + \beta_2 \Delta\text{EARNMV}\times\text{SIN} + \beta_3 \Delta\text{EARNMV}\times\text{LEV} + \beta_4 \Delta\text{EARNMV}\times\text{MB} + \beta_5 \Delta\text{EARNMV}\times\text{SIZE} + \beta_6 \Delta\text{EARNMV}\times\text{BETA} + \varepsilon
\]  

where \( CAR \) is the cumulative abnormal return for the twelve-month period ending three months after the fiscal year end; \( \Delta\text{EARNMV} \) is the annual change in earnings deflated by market value of equity at the beginning of the return accumulation period; \( \text{SIN} \) is an indicator variable, which equals one if the firm is categorized as a sin firm; \( \text{LEV} \) is the ratio of debt (long term debt plus debt in current liabilities) to total assets at the beginning of the fiscal year; \( \text{MB} \) is the market to
book ratio at the beginning of the fiscal year; SIZE is the log of market value of equity at the beginning of the fiscal year; and BETA is the firm’s systematic risk measured using monthly returns in the five years prior to the beginning of the current fiscal year. In equation (1), we control for both industry (β_I) and year (β_t) fixed effects.

The primary coefficient of interest is that on ΔEARNMV*SIN, or β_2, that captures the incremental ERC of sin firms. We predict that β_2 is negative, indicating that the ERC of sin stocks is lower than that of the control firms. Because earnings response coefficient is known to systematically differ across firms in cross-section based on growth, size, leverage and risk, we control for these variables by interacting ΔEARNMV with proxies for these variables (see Collins and Kothari 1989). Specifically, we interact ΔEARNMV with market-to-book ratio, firm size, leverage, and market beta. Recall that in Table 2 we found significant differences between the treatment and control firms for size, market-to-book ratio, leverage and beta. Thus, it is imperative that we include these interaction terms to control for these differences. In terms of predicted signs on these control variables, consistent with prior research, we expect the coefficients on ΔEARNMV*MB and ΔEARNMV*SIZE variables to be positive, whereas the coefficients on ΔEARNMV*LEV and ΔEARNMV*BETA are expected to be negative.

Table 3 presents the results of the ERC regression specification. We present results with and without the control variable interaction terms. Notice that the number of observations when including the interaction terms decline considerably (14,513 to 12,013). This is because the market beta is not available for all our sample observations. Consistent with expectations, we find that sin firms are associated with lower response coefficients regardless of whether the control variables are included in the specification. In the full model, the coefficient on β_2 is statistically negative (coefficient on ΔEARNMV*SIN of −0.370 [t-statistic of −3.59]). In contrast, the
control sample ERC, captured by $\beta_j$, is positive and statistically significant (coefficient = 0.793 [t-statistic = −13.12]).

Thus, the ERC for sin firms is merely half of the ERC for control firms. This suggests that market participants underweight sin stocks’ earnings relative to control firms. Moreover, consistent with prior research, we find that the interaction terms $EARNMV*\beta$, and $EARNMV*LEV$ have the predicted signs and are statistically significant.

The market’s underweighting of sin firms is consistent with the “neglect effect” documented by Hong and Kacperczyk (2005). However, as argued before, such neglect of sin stocks by market participants may be manifested by differences in earnings quality. To explore this alternative explanation, we compare earnings quality for sin firms and control firms. Because there are several definitions of earnings quality in the accounting literature, we measure quality along three dimensions: persistence of the earnings and its accrual component, predictive ability of earnings for future cash flows and timeliness of loss recognition in earnings.

4.1 Persistence of Earnings and its Components

Earnings quality is often defined in terms of persistence, since it captures the extent to which earnings are sustainable. For example, Revsine, Collins, and Johnson (2004) argue that earnings are of higher quality when earnings are likely to recur or persist. Analysts are also known to focus on sustainable or recurring earnings as they tend to eliminate non-recurring charges when making earnings forecasts (AICPA 1994). Thus, earnings that are more persistent are viewed as higher quality earnings.

We use the following regression specification to test the relative earnings persistence for sin and control firms:

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8 The use of persistence as a measure of earnings quality is also implicitly recognized in the FASB’s Conceptual Framework (SFAC 1) and FAS 132.
\[ EPS_t = \alpha_0 + \alpha_1 + \alpha_I EPS_{t-1} + \alpha_2 EPS_{t-1} \times SIN + \mu \]  

where \( EPS_t \) and \( EPS_{t-1} \) are current year and lagged earnings per share, respectively. \( \alpha_I \) and \( \alpha_t \) capture industry and year fixed effects, respectively. \( \alpha_1 \) captures the persistence for control firms whereas \( \alpha_2 \) captures the incremental persistence for sin firms. If lower persistence of earnings is the explanation for the lower earnings response coefficient of sin firms (see Table 3), then we predict that the coefficient on \( \alpha_2 \) to be negative.

Panel A of Table 4 presents the results of estimating equation (2). The persistence coefficient for control firms is positive and significant (coefficient = 0.55 [t-statistic = 83.31]). However, we find that the earnings persistence of sin firm is significantly higher than control firms (\( \alpha_2 \) coefficient = 0.16; t-statistic = 5.65). This is inconsistent with the hypothesis that investors underweight earnings of sin firms because of lower earnings persistence.

While this result signifies higher earnings persistence for sin firms, it is not clear whether such higher earnings persistence is due to accounting attributes (accruals) or fundamentals (cash flows). Sloan (1996) documents that the two main components of earnings, cash flows and accruals, have different persistence properties. This is because, while both cash flows and accruals provide relevant information for predicting future cash flows, the accrual component has potentially lower reliability due to the latitude allowed under U.S. GAAP in determining those accruals. Thus, Sloan (1996) hypothesizes that the accrual component mean reverts faster than the cash flow component and consequently, is less persistent than the cash component. In our setting, it is possible that we obtain higher earnings persistence because of two countervailing forces. Sin firms may have poor earnings quality in that they have more mean reverting accruals, but at the same time such higher mean reverting accruals are compensated by more reliable and persistent cash flows.
To examine whether the higher persistence obtained for sin firms is attributable to higher accrual or cash flow persistence or both, we adapt the empirical specification in Sloan (1996) as follows:

\[ EARN_{t+1} = \delta_0 + \delta_1 + \delta_1CFO_t + \delta_2 ACC_t + \delta_3 CFO_t* SIN + \delta_4 ACC_t* SIN + \eta \]  

where \( EARN_{t+1} \) is one-year ahead net income before extraordinary items scaled by average total assets; \( CFO_t \) is cash from operations adjusted for the accrual portion of extraordinary items and discontinued operations scaled by average total assets; and \( ACC_t \) is total accruals scaled by average total assets. \( \delta_I \) and \( \delta_T \) capture industry and year fixed effects respectively.

Consistent with Sloan (1996), we predict the coefficients on \( \delta_1 \) and \( \delta_2 \) to be positive and \( \delta_1 \) to be greater than \( \delta_2 \), suggesting greater cash flow persistence than accrual persistence. \( \delta_3 \) and \( \delta_4 \) capture the incremental cash flow and accrual persistence for sin firms. Given the findings in Panel A of Table 4 that sin firms have greater earnings persistence, three outcomes are plausible in estimating equation (3): i) both components have higher persistence, ii) only one component has higher persistence and iii) one component has higher persistence but dominates the lower persistence of the other component. A lower persistence for the accrual component of earnings for sin firms \( (\delta_4 < 0) \) would be consistent with the hypothesis that sin firms are neglected for reasons of differential earnings quality (in this case greater unreliable accruals).

Table 4 (Panel B) provides the result of estimating equation (3). Consistent with Sloan (1996), we find that the coefficient on both accruals and cash flows \( \delta_1 \) and \( \delta_2 \) are positive and statistically significant \( (\text{coefficient} = 0.93, 0.47; \text{t-statistic} = 132.13, 44.84) \). More importantly, the persistence of cash flows is much greater than that of accruals and statistically significant at p-value < 0.01. Of interest to this paper, we find that, while the incremental cash flow persistence for sin firms \( (\delta_3) \) is not significantly different from zero, whereas the incremental
accrual persistence ($\delta_4$) is positive and significant (coefficient = 0.15; t-statistic = 3.30). This suggests that the higher earnings persistence for sin firms reported earlier is attributable to better earnings quality from reliable accruals of sin firms.

4.2 Predictive Ability of Earnings for Future Cash Flows

The second measure for financial reporting quality considered is the ability of earnings and its components to predict future cash flows. One of the primary objectives of financial reporting is to provide information (in particular, earnings) that helps investors, creditors, and others assess future cash flows (FASB 1978, pp 37-39). Thus, measuring the extent to which earnings and its components help predict future cash flows can help us assess the quality of earnings. Following Dechow, Kothari and Watts (1998) and Barth, Cram and Nelson (2001), we use the following empirical specification to gauge a firm’s earnings quality:

$$CFO_{t+1} = \gamma_0 + \gamma_1 + \gamma_2 CFO_t + \gamma_3 \Delta AR_t + \gamma_4 \Delta INVENT_t + \gamma_5 \Delta AP_t + \gamma_6 \Delta DEPR_t + \gamma_7 \Delta OTHER_t + \kappa_{t+1}$$

where $CFO_{t+1}$ and $CFO_t$ are the cash from operations in years $t+1$ and $t$ adjusted for the accrual portion of extraordinary items and discontinued operations in the respective years; $\Delta AR_t$ is the change in accounts receivable; $\Delta INVENT_t$ is the change in inventory; $\Delta AP_t$ is the change in accounts payable and accrued liabilities; $\Delta DEPR_t$ is the depreciation and amortization expense; and $\Delta OTHER_t$ is all other accruals, calculated as $(EARN - (CFO + \Delta AR + \Delta INVENT - \Delta AP - \Delta DEPR))$. All variables are scaled by average total assets. $\gamma_1$ and $\gamma_7$ represent industry and year fixed effects, respectively.

The residuals from regression specification (4) capture the deviation from the ability of earnings and components to predict future cash flows. Thus, we use the magnitude of this deviation, i.e., the absolute value of the residual, $|\kappa_{t+1}|$, as our empirical measure of earnings.
quality. A higher absolute value of the residual implies lower predictive ability of current cash
flows and accrual components for future cash flows and consequently, lower earnings quality.

As an alternative to the model specified in (4), we also estimate earnings quality using a
how accruals, in particular, working capital accruals, relate to the prediction of past, current and
future operating cash flow realizations. Because accruals inherently include management
estimates, the extent to which they map into cash flow realizations is influenced by the
measurement error in accruals. Thus, any unexplained portion of the mapping of accruals and
cash flow realizations reflects poor quality accruals and earnings. McNichols (2002) argues that
certain firm-specific factors that might influence current accruals should be included in the
Dechow and Dichev (2002) model to avoid overstatement of the measurement error in the
predictive ability of accruals for future cash flows. Specifically, McNichols (2002) suggests
augmenting the Dechow and Dichev model with change in sales and property, plant and
equipment that has been shown by Jones (1991) to determine the amount of current accruals.
Thus, as with Francis et al. (2005), we estimate the following empirical specification that maps
working capital accruals to lagged, current and future operating cash flows after controlling for
changes in sales and PPE:

$$
\Delta WC_t = \gamma_0 + \gamma_1 + \gamma_2 CFO_t + \gamma_3 CFO_{t+1} + \gamma_4 \Delta SALES_t + \gamma_5 PPE_t + \kappa_t
$$

where $\Delta WC_t$ is the change in working capital accounts ($\Delta AR + \Delta INVENT + \Delta AP + \Delta OTHER$) as
disclosed in the statement of cash from operations, $\Delta SALES$ is the change in sales; and $PPE$ is gross
property, plant, and equipment. As before, all variables are scaled by average total assets. As
with the interpretation of residuals in equation (4), the absolute value of the residuals from
equation (5) is another representation of the earnings quality metric. That is, a higher \(|\kappa_t|\) implies lower earnings quality.

Ideally, we would like to estimate equations (4) and (5) at the industry level for each year. However, in many instances, we do not have enough observations to obtain reasonable parameter estimates. Therefore, we do a pooled cross-sectional analysis wherein we include industry and year dummies that capture any variation in accruals and cash flows across time and industries. As a sensitivity check, we use industry level estimation of the residuals for a reduced sample. Inferences based on these residuals do not alter our conclusions.

We use the estimates of the residuals from equations (4) and (5) as our proxy for earnings quality and assess whether sin firms have systematically different levels of earnings quality than control firms. We adapt a model used by Cohen (2004) and Ali et al. (2005) to examine differences in reporting quality across sin and non-sin firms after controlling for several forces that influence earnings quality. We estimate the following regression:

\[
QUALITY = \phi_0 + \phi_1 + \phi_2 \\text{SIN} + \phi_3 \text{OWNER} + \phi_4 \text{GROWTH} + \phi_5 \text{MARGIN} + \phi_6 \text{LEV} + \phi_7 \text{OC} + \phi_8 \text{SIZE} + \omega
\]  

[6]

where \(QUALITY\) is an indicator variable equal to 1 if \(|\kappa|\) estimated from equations (4) and (5) is less than its median value, zero otherwise; \(OWNER\) is the natural log of the number of shareholders of a firm less the natural log of median number of shareholders for the same two-digit SIC code; \(HERFINDEX\) is the Herfindahl Index, calculated as the sum of squares of market shares of the firm in the industry (two-digit SIC code); \(GROWTH\) is the current year’s growth in sales; \(MARGIN\) is the firm’s gross margin percentage; \(LEV\) is long-term debt plus the current portion of long-term debt divided by total assets; \(OC\) is operating cycle (in days) and is calculated as \([(AR_t + AR_{t-1})/2 \/(\text{SALES}_t/360)] + [(\text{INVENT}_t + \text{INVENT}_{t-1})/2 \/(\text{COGS}_t/360)]\) where \(AR\) is accounts receivable, \(INVENT\) is
inventory, $SALES$ is total sales, $COGS$ is cost of goods sold; $\varphi_i$ and $\varphi_t$ represent industry and year fixed effects, respectively; and other variables are as previously defined.

Because our dependent variable, $QUALITY$, is an indicator variable, we estimate equation (6) as a logit model. Notice that we have defined the indicator variable, $QUALITY$, such that it is increasing in earnings quality. We include several control variables to capture cross-sectional differences in the quality of accounting earnings. First, we include $OWNER$ to recognize that the demand for better quality accounting information is likely to differ based on ownership concentration. Cohen (2004) finds that firms with a disperse ownership structure are more likely to demand firm-specific higher quality information and hence, we predict the coefficient on $OWNER$ to be positive. Consistent with prior empirical work (e.g., DeFond and Jiambalvo 1994, Minton and Schrand 1999), we include the $LEV$ variable to capture firms’ incentives to manage earnings to avoid debt covenant violations. Thus, we predict that highly-levered firms have higher incentives to manage earnings and hence, consequently lower quality earnings. However, the larger agency costs associated with leverage may increase the demand for better quality earnings from bondholders. Thus, we do not predict the sign on the coefficient on $LEV$. We control for growth because of the strong incentives to manage earnings by growing firms and avoid the torpedo effect documented by Skinner and Sloan (1999). We include the Herfindahl index and gross margin to capture product market competition and proprietary costs associated with disclosure of high quality information. Finally, we control for firm size and length of operating cycle as additional factors known to influence the quality of accruals (Dechow and Dichev 2002).

We present the results of estimating equation (6) in Table 5. We report two sets of results based on the two different estimates of earnings quality obtained from specifications (4) and (5).
Contrary to expectations, we find that sin firms are characterized by higher quality earnings than the control group. In particular, we find the coefficient on $SIN(\phi I)$ is systematically positively related to $QUALITY$ using both measures of accrual quality estimated from equations (4) and (5). Results also indicate that firm size, leverage, and margin are associated with higher earnings quality, whereas operating cycle, sales growth, and dispersion in ownership are associated with lower earnings quality. Overall, we conclude that sin firms are more likely to exhibit better financial reporting quality, as determined by the ability of accrual earnings to predict future cash flows.

4.3 Loss Recognition

Our final measure for financial reporting quality is based on the timely loss recognition aspect of earnings (Basu, 1997). In general, timely loss recognition improves the timeliness of earnings and the usefulness of financial statements, and specifically improves efficiency in debt and compensation contracting (Ball and Shivakumar, 2005). From an equity investor standpoint, timely loss recognition is advantageous because it mitigates potential agency problems associated with managers’ investment decisions. If managers realize, ex ante, that losses are immediately recognized in earnings, they are less likely to invest in negative NPV projects or indulge in empire building activities that have negative earnings consequences in the short run.

We employ the model in Ball and Shivakumar (2005) to capture the extent of conservatism in accrual accounting with respect to timely recognition of losses. Ball and Shivakumar (2005) modify Dechow and Dichev (2002) and Jones (1991) specifications to incorporate variables capturing economic losses to determine the extent to which accounting accruals reflect those losses in a timely fashion. We augment their model to incorporate the differential timely loss recognition for sin firms (see equations [7a] and [7b] below).
\[
\Delta WC_t = \theta_0 + \theta_1 + \theta_2 \text{CFO}_t + \theta_3 \text{CFO}_{t-1} + \theta_3 \text{CFO}_{t+1} \\
+ \theta_4 \text{DCFO}_t + \theta_5 \text{DCFO}_t \ast \text{CFO}_t + \theta_6 \text{DCFO}_t \ast \text{CFO}_t \ast \text{SIN} + \psi
\] [7a]

\[
\text{ACC}_t = \theta_0 + \theta_1 + \theta_1 \text{CFO}_t + \theta_2 \Delta \text{SALES}_t + \theta_3 \text{PPE}_t \\
+ \theta_4 \text{DCFO}_t + \theta_5 \text{DCFO}_t \ast \text{CFO}_t + \theta_6 \text{DCFO}_t \ast \text{CFO}_t \ast \text{SIN} + \psi
\] [7b]

where \( \text{DCFO}_t \) is an indicator variable equal to 1 if \( \text{CFO}_t < 0 \), zero otherwise; and other variables are as previously defined. \( \theta_I \) and \( \theta_t \) represent industry and time fixed effects, respectively.

Consistent with Ball and Shivakumar (2005), we use the presence of negative cash flows as our proxy for economic losses. The loss recognition role of accruals is captured by the relation between cash flows and accruals when the firm is experiencing economic losses, i.e., coefficient \( \theta_5 \) on \( \text{DCFO} \ast \text{CFO} \). \( \theta_5 \) is predicted to be positive, suggesting that accruals recognizing losses in a more timely fashion than gains. For the purpose of our paper, we are more interested in \( \theta_6 \), which captures whether sin firms recognize losses in a more timely fashion than non-sin firms.

Results from estimating equations (7a) and (7b) are presented in panel A of Table 6. The coefficients on current, lagged and future cash flows are all consistent with findings in prior research. The coefficient on the interaction term that captures timely loss recognition of cash flows for control firms (\( \theta_5 \)) is economically and statistically very similar to the results presented in Ball and Shivakumar (2005). The coefficients on \( \theta_5 \) are 0.23 (t-statistic = 20.38) and 0.57 (t-statistic of 30.03) in the Dechow-Dichev and Jones models, respectively, implying that the timely loss recognition role of accruals is at work. With respect to loss recognition of sin firms, we find that in the Dechow-Dichev specification the coefficient on \( \theta_6 \) is positive and statistically significant (coefficient = 0.18; t-statistic = 4.59). This indicates that sin firms have more timely recognition of losses than do control firms. However, in the Jones model, we are unable to find significant differences between sin firms and their control counterparts (\( \theta_6 \) coefficient = −0.006; t-statistic = −0.09);
Next, we consider the relation between accruals and cash flows in a changes form with an economic loss proxy, captured by a decrease in operating cash flows.

\[
\Delta WC_t = \theta_0 + \theta_1 + \theta_2 CFO_t + \theta_3 CFO_{t-1} + \theta_4 CFO_{t+1} + \theta_5 \Delta CFO_t + \theta_6 \Delta CFO_t * \Delta CFO_t * SIN + \psi
\]

\[
\Delta WC_t = \theta_0 + \theta_1 + \theta_2 CFO_t + \theta_3 CFO_{t-1} + \theta_4 CFO_{t+1} + \theta_5 \Delta CFO_t + \theta_6 \Delta CFO_t * \Delta CFO_t * SIN + \psi
\]

\[
\Delta WC_t = \theta_0 + \theta_1 + \theta_2 CFO_t + \theta_3 CFO_{t-1} + \theta_4 CFO_{t+1} + \theta_5 \Delta CFO_t + \theta_6 \Delta CFO_t * \Delta CFO_t * SIN + \psi
\]

where \( \Delta CFO_t \) is an indicator variable equal to 1 if \( \Delta CFO_t < 0 \), zero otherwise; other variables are as previously defined.

Panels B of Table 6 presents our findings. In both the Dechow-Dichev and Jones specifications, the coefficient on the timely loss recognition for sin firms (\( DCFO_t * CFO_t * SIN \)) is positive and statistically significant. Thus, our results are robust to the alternative ways in which we measure economic losses. The general conclusion from these findings is that sin firms exhibit more timely loss recognition than a set of control firms, implying that sin firms follow more conservative accounting practices in an effort to improve overall financial reporting quality.

4.4 Robustness Checks

One plausible explanation for the finding that sin stocks have better financial reporting quality is the heavy regulatory oversight encountered by these firms. For example, David Berman (2002) suggests that “sin stocks tend to benefit from very conservative accounting because their industries fall under considerable scrutiny from regulators.” Alcohol and gaming stocks are likely to face lower levels of litigation risk because alcohol prohibition in the U.S. was repealed in 1933, making the production and consumption of alcohol legally acceptable. Furthermore, the gambling industry was deregulated in the 1990’s. However, unlike alcohol and gaming industries, the tobacco industry continues to experience higher levels of regulatory
scrutiny and litigation risk. Although the tobacco settlement between states and the tobacco industry in 1997 reduced the overall litigation risk faced by tobacco industry, it is plausible that this industry faces the most significant risk of litigation when compared to other sin industries.

We control for litigation risk in two ways. First, like Hong and Kazperczyk (2005), we control for several proxies of litigation risk such as the market to book ratio, leverage, firm size and beta in our empirical analysis. Our inferences are not changed when we include these factors. Second, we exclude tobacco firms from our sample and conduct all the empirical analyses using the reduced sample. Our results (untabulated) suggest that the financial reporting quality of sin firms is better than that of the control firms even after eliminating tobacco firms (i.e. for sex, gambling and alcohol firms only). Thus, our findings are robust to controlling for litigation risk factors that might influence cross sectional differences in financial reporting quality.

5. Concluding Remarks

Societal norms advocate that agents (investors) shy away from firms with activities that are considered sinful even when it is advantageous for them to do so. In a recent study of the effects of social norms on capital markets, Hong and Kacperczyk’s (2005) find that, despite exhibiting superior market returns, a category of stocks involved in “sinful” activities such as production of tobacco, alcohol and gambling are neglected by market participants, including analysts and institutional investors. They conclude that investor aversion to such stocks is due to a preference for adhering to social norms rather than rational economic reasons. Consistent with the neglect of sin stocks, for our sample, we find that the earnings response coefficients for sin stocks are lower than a matched sample.
In this paper, we hypothesize that part of the neglect identified by Hong and Kacperczyk may be attributable to differential information risk for these firms. That is, sin stocks may possess greater information risk due to poor financial reporting quality and this could, in turn, explain investor neglect and superior returns. To test this hypothesis, we conduct a series of analysis to determine whether sin firms have poor financial reporting quality measured in three different ways: persistence of earnings, predictive ability of accruals future cash flows, timely loss recognition. Across all these measures, contrary to expectations, we find that sin firms have better earnings quality than those of the control firms. That is, we find that sin stocks exhibit more persistent earnings and accruals, have accruals that better predict future cash flows, and recognize losses on a more timely fashion relative to the control group of non-sin firms.

The inference from these findings is that capital market participants have an overriding desire to introduce a non financial factor into the investment selection criteria, such as the nature of a firm’s operations, which is undeterred even by superior market returns and financial reporting quality. We conclude that the neglect by market participants is not attributable to financial reporting factors. Our tests do not preclude the possibility that the market neglect of sin stocks is attributable to potential long run political costs, regulatory costs, and future taxes on sin products. Nonetheless, we control for litigation risk by eliminating tobacco firms that are the subject of most regulatory scrutiny as well as controlling for common litigation risk factors, such as the market to book ratio, leverage, firm size and beta. Our inferences are robust.

Overall, our results are consistent with sin stocks providing high quality financial information to attract a wider investment and analyst base. In addition to better quality financial reports, sin stocks also make attempts at improving their image via charitable donations and socially responsible activities such as better recycling (Aherns 2004). However, it is not obvious
that such attempts ameliorate the effects of social norms that influence investors in neglecting these stocks.
References


Phillips, Hager & North Investment Management Ltd. Does socially responsible investing hurt investment returns?


### Table 1

Sin Firms Representation by Industry

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industry</th>
<th>Sin Firms</th>
<th>Control Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Food</td>
<td>25</td>
<td>135</td>
</tr>
<tr>
<td>21</td>
<td>Tobacco</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>Paper</td>
<td>1</td>
<td>57</td>
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<tr>
<td>27</td>
<td>Printing and Publishing</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>28</td>
<td>Chemicals</td>
<td>3</td>
<td>586</td>
</tr>
<tr>
<td>34</td>
<td>Fabricated Metal</td>
<td>1</td>
<td>121</td>
</tr>
<tr>
<td>35</td>
<td>Machinery</td>
<td>1</td>
<td>571</td>
</tr>
<tr>
<td>39</td>
<td>Miscellaneous Manufacturing</td>
<td>3</td>
<td>94</td>
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<td>48</td>
<td>Communications</td>
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<td>120</td>
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<tr>
<td>50</td>
<td>Wholesale Trade-durable goods</td>
<td>2</td>
<td>166</td>
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<tr>
<td>51</td>
<td>Wholesale Trade-nondurable goods</td>
<td>3</td>
<td>110</td>
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<tr>
<td>55</td>
<td>Automotive Dealers and Gas Stations</td>
<td>1</td>
<td>29</td>
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<tr>
<td>58</td>
<td>Eating and Drinking Places</td>
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<td>59</td>
<td>Miscellaneous Retail</td>
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<td>70</td>
<td>Hotels, Rooming Houses and Lodging</td>
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<td>79</td>
<td>Amusement and Recreation Services</td>
<td>56</td>
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<td>87</td>
<td>Engineering, Accounting, Research and Related Services</td>
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<td>99</td>
<td>Nonclassifiable Establishments</td>
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<td>64</td>
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### Table 2
Descriptive Statistics of Sin and Control Firms

<table>
<thead>
<tr>
<th></th>
<th>Mean Sin Firms</th>
<th>Median Sin Firms</th>
<th>Difference (t-stat) Sin Firms</th>
<th>Mean Non Sin Firms</th>
<th>Median Non Sin Firms</th>
<th>Difference (t-stat) Non Sin Firms</th>
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<tbody>
<tr>
<td><strong>ERC Regression Variables</strong></td>
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<td></td>
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<tr>
<td>CAR (%)</td>
<td>6.348</td>
<td>6.771</td>
<td>-0.20 2.115</td>
<td>1.196</td>
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<td>△EARNMV</td>
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<td>0.016</td>
<td>-1.21 0.006</td>
<td>0.005</td>
<td>0.65</td>
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<td>LEV</td>
<td>0.371</td>
<td>0.225</td>
<td>16.65 0.362</td>
<td>0.200</td>
<td>16.93</td>
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<td>MB</td>
<td>2.780</td>
<td>3.230</td>
<td>-2.77 1.907</td>
<td>2.015</td>
<td>-3.83</td>
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<td>SIZE</td>
<td>5.322</td>
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<td>5.46 5.155</td>
<td>4.679</td>
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<td>-8.00 0.831</td>
<td>1.016</td>
<td>-7.34</td>
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<td><strong>Persistence Regression Variables</strong></td>
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<tr>
<td>EPS</td>
<td>0.120</td>
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<td>2.56 0.380</td>
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<td>EARN</td>
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<td>8.46 0.030</td>
<td>0.031</td>
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<td>CFO</td>
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<td>0.016</td>
<td>14.00 0.082</td>
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<td>ACC</td>
<td>-0.069</td>
<td>-0.057</td>
<td>-2.70 -0.055</td>
<td>-0.047</td>
<td>-4.46</td>
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<td><strong>Prediction of Future Cash Flow and Loss Recognition Regression Variables</strong></td>
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<td></td>
<td></td>
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<tr>
<td>△AR</td>
<td>-0.005</td>
<td>-0.013</td>
<td>7.45 -0.002</td>
<td>-0.005</td>
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<td>△INVENT</td>
<td>-0.005</td>
<td>-0.009</td>
<td>3.25 0.000</td>
<td>-0.000</td>
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<tr>
<td>△AP</td>
<td>0.006</td>
<td>0.007</td>
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<td>△SALES</td>
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<td>PPE</td>
<td>0.746</td>
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<td>OWNER</td>
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<td>HERFINDEX</td>
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<td>GROWTH</td>
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<td>MARGIN</td>
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<td>13.94 0.390</td>
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<td>OC</td>
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<td>154.300</td>
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<td><strong>Number of Obs</strong></td>
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<td>13,734</td>
<td></td>
<td>779</td>
<td>13,734</td>
<td></td>
</tr>
</tbody>
</table>

*CAR* is the cumulative abnormal return for the twelve-month period ending three months after the fiscal year end;

*ΔEARNMV* is the annual change in earnings deflated by market value of equity at the beginning of the return accumulation period;

*LEV* is the ratio of total long-term debt (plus the current portion of long-term debt) to total assets at the beginning of the fiscal year;

*MB* is the market to book ratio at the beginning of the fiscal year;

*SIZE* is the log of market value of equity at the beginning of the fiscal year;
Table 2 (Continued)

\( \beta \) is the firm’s systematic risk measured in the calendar year in which the beginning of the fiscal year falls;

\( \text{EPS}_t \) is current year earnings per share;

\( \text{EARN} \) is net income before extraordinary items scaled by average total assets;

\( \text{CFO} \) is cash from operations scaled by average total asset;

\( \text{ACC} \) is total accruals scaled by average total assets.

\( \Delta \text{AR}_t \) is the change in accounts receivable;

\( \Delta \text{INVENT}_t \) is the change in inventory;

\( \Delta \text{AP}_t \) is the change in accounts payable and accrued liabilities;

\( \text{DEPR}_t \) is the depreciation and amortization expense;

\( \text{OTHER}_t \) is net of all accruals, calculated as \( (\text{EARN} - (\text{CFO} + \Delta \text{AR} + \Delta \text{INVENT} - \Delta \text{AP} - \text{DEPR})) \);

\( \Delta \text{WC}_t \) is the change in working capital accounts as disclosed on the statement of cash from operations, measured as the increase in accounting receivable plus the decrease in inventory less the decrease in accounts payable and accrued liabilities plus the decrease in taxes accrued plus the increase (decrease) in other assets (liabilities) deflated by average total assets;

\( \Delta \text{SALES} \) is the change in sales deflated by average total assets;

\( \text{PPE} \) is property, plant, and equipment deflated by average total assets;

\( \text{OWNER} \) is the natural log of the number of shareholders of a firm less the natural log of median number of shareholders for the same two-digit SIC code;

\( \text{HERFINDEX} \) is the Herfindahl Index, calculated as the sum of squares of market shares of the firms in the industry (two-digit SIC code);

\( \text{GROWTH} \) is the current year’s growth in sales measured as current year sales deflated by prior year’s sales;

\( \text{MARGIN} \) is the firm’s gross margin percentage; and

\( \text{OC} \) is operating cycle (in days) and is calculated as \( \frac{(\text{AR}_t + \text{AR}_{t-1})}{2} / \text{SALES}_t / 360 \) + \( \frac{(\text{INVENT}_t + \text{INVENT}_{t-1})}{2} / \text{COGS}_t / 360 \) where \( \text{SALES}_t \) is total sales, \( \text{COGS}_t \) is cost of goods sold.
Table 3
Analysis of Earnings Response Coefficients for Sin Firms

\[
CAR = \beta_0 + \beta_1 + \beta_t + \beta_1 \Delta EARNMV + \beta_2 \Delta EARNMV \times SIN + \beta_3 \Delta EARNMV \times LEV + \beta_4 \Delta EARNMV \times MB + \beta_5 \Delta EARNMV \times SIZE + \beta_6 \Delta EARNMV \times BETA + \varepsilon
\]  

where \( CAR \) is the cumulative abnormal return for the twelve-month period ending three months after the fiscal year end; \( \Delta EARNMV \) is the annual change in earnings deflated by market value of equity at the beginning of the return accumulation period; \( SIN \) is an indicator variable, which equals one if the firm is categorized as a sin firm; \( LEV \) is the ratio of debt (long term debt plus debt in current liabilities) to total assets at the beginning of the fiscal year; \( MB \) is the market to book ratio at the beginning of the fiscal year; \( SIZE \) is the log of market value of equity at the beginning of the fiscal year; and \( BETA \) is the firm’s systematic risk measured in the calendar year in which the beginning of the fiscal year falls. In equation (1), we control for both industry (\( \beta_I \)) and year (\( \beta_t \)) fixed effects.

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Sign</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>?</td>
<td>0.285</td>
<td>9.31</td>
<td>0.282</td>
<td>8.63</td>
</tr>
<tr>
<td>( \Delta EARNMV )</td>
<td>+</td>
<td>0.660</td>
<td>31.62</td>
<td>0.793</td>
<td>13.12</td>
</tr>
<tr>
<td>( \Delta EARNMV \times SIN )</td>
<td>+</td>
<td>−0.303</td>
<td>−3.27</td>
<td>−0.370</td>
<td>−3.59</td>
</tr>
<tr>
<td>( \Delta EARNMV \times LEV )</td>
<td>−</td>
<td>−0.252</td>
<td>−2.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta EARNMV \times MB )</td>
<td>+</td>
<td>0.000</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta EARNMV \times SIZE )</td>
<td>+</td>
<td>0.016</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta EARNMV \times BETA )</td>
<td>−</td>
<td>−0.073</td>
<td>−2.49</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjusted \( R^2 \) 12.44% 12.93%

\# of Observations 14,513 12,013
Table 4
Analysis of Persistence of Earnings and its Components for Sin Firms

Panel A: Regression Specification of Sin Firms and Earnings Persistence

\[ EPS_t = \alpha_0 + \alpha_I + \alpha_t + \alpha_1 EPS_{t-1} + \alpha_2 EPS_{t-1} \ast SIN + \mu \]  

where \( EPS_t \) and \( EPS_{t-1} \) are current year and lagged earnings per share, respectively; and \( SIN \) is an indicator variable, which equals one if the firm is categorized as a sin firm. \( \alpha_I \) and \( \alpha_t \) represent industry and time fixed effects.

<table>
<thead>
<tr>
<th>Predicted Sign</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-0.787</td>
</tr>
<tr>
<td>( EPS_{t-1} )</td>
<td>+</td>
<td>0.546</td>
</tr>
<tr>
<td>( EPS_{t-1} \ast SIN )</td>
<td>-</td>
<td>0.158</td>
</tr>
</tbody>
</table>

Adjusted \( R^2 \) 36.19%

\# of Observations 14,513

Panel B: Regression Specification of Sin Firms and Persistence of Earnings Components

\[ EARN_{t+1} = \delta_0 + \delta_I + \delta_t + \delta_1 CFO_t + \delta_2 ACC_t + \delta_3 CFO_t \ast SIN + \delta_4 ACC_t \ast SIN + \eta \]  

where \( EARN_{t+1} \) is one-year ahead net income before extraordinary items scaled by average total assets; \( CFO_t \) is cash from operations adjusted for the accrual portion of extraordinary items and discontinued operations scaled by average total asset; \( ACC_t \) is total accruals scaled by average total assets. \( \delta_I \) and \( \delta_t \) represent industry and time fixed effects.

<table>
<thead>
<tr>
<th>Predicted Sign</th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-0.081</td>
</tr>
<tr>
<td>( CFO_t )</td>
<td>+</td>
<td>0.934</td>
</tr>
<tr>
<td>( ACC_t )</td>
<td>+</td>
<td>0.467</td>
</tr>
<tr>
<td>( CFO_t \ast SIN )</td>
<td>-</td>
<td>0.000</td>
</tr>
<tr>
<td>( ACC_t \ast SIN )</td>
<td>-</td>
<td>0.153</td>
</tr>
</tbody>
</table>

Adjusted \( R^2 \) 60.83%

\# of Observations 14,513
Table 5
Sin Firms and Predictability of Future Cash Flows

\[ \text{CFO}_{t+1} = \gamma_0 + \gamma_1 + \gamma_2 \text{CFO}_t + \gamma_3 \Delta \text{AR}_t + \gamma_4 \Delta \text{AP}_t + \gamma_5 \text{DEPR}_t + \gamma_6 \Delta \text{OTHER}_t + \kappa_{t+1} \]  

where \( \text{CFO}_{t+1} \) and \( \text{CFO}_t \) are the cash from operations in years \( t+1 \) and \( t \) adjusted for the accrual portion of extraordinary items and discontinued operations in the respective years; \( \Delta \text{AR}_t \) is the change in accounts receivable; \( \Delta \text{INVENT}_t \) is the change in inventory; \( \Delta \text{AP}_t \) is the change in accounts payable and accrued liabilities; \( \Delta \text{OTHER}_t \) is net of all accruals, calculated as \( (\text{EARN} - (\text{CFO} + \Delta \text{AR} + \Delta \text{INVENT} - \Delta \text{AP} - \text{DEPR})) \). All the variables are scaled by average total assets. \( \gamma_1 \) and \( \gamma_2 \) represent industry and year fixed effects, respectively.

\[ \Delta \text{WC}_t = \gamma_0 + \gamma_1 + \gamma_2 \text{CFO}_{t-1} + \gamma_3 \text{CFO}_t + \gamma_4 \text{CFO}_{t+1} + \gamma_5 \Delta \text{SALESt} + \gamma_6 \text{PPE}_t + \kappa_t \]

where \( \Delta \text{WC}_t \) is the change in working capital accounts (\( \Delta \text{AR} + \Delta \text{INVENT} + \Delta \text{AP} + \Delta \text{OTHER} \)) as disclosed in the statement of cash from operations, \( \Delta \text{SALES} \) is the change in sales; and \( \text{PPE} \) is gross property, plant, and equipment. All variables are scaled by average total assets.

\[ \text{QUALITY} = \phi_0 + \phi_1 + \phi_2 SIN + \phi_3 \text{OWNER} + \phi_4 \text{HERFINDEX} + \phi_5 \text{GROWTH} + \phi_6 \text{MARGIN} + \phi_7 \text{LEV} + \phi_8 \text{OC} + \phi_9 \text{SIZE} + \omega \]

where \( \text{QUALITY} \) is an indicator variable equal to 1 if \(|\kappa|\) estimated from equations (4) and (5) is less than its median value, zero otherwise; \( \text{OWNER} \) is the natural log of the number of shareholders of a firm less the natural log of median number of shareholders for the same two-digit SIC code; \( \text{HERFINDEX} \) is the Herfindahl Index, calculated as the sum of squares of market shares of the firm in the industry (two-digit SIC code); \( \text{GROWTH} \) is the current year’s growth in sales; \( \text{MARGIN} \) is the firm’s gross margin percentage; \( \text{LEV} \) is long-term debt plus the current portion of long-term debt divided by total assets; \( \text{OC} \) is operating cycle (in days) and is calculated as \[ \frac{(\text{AR}_t + \text{AR}_{t-1})}{2} / \text{SALES} / 360 \] \[ \frac{(\text{INVENT}_t + \text{INVENT}_{t-1})}{2} / \text{COGS} / 360 \]

where \( \text{AR} \) is accounts receivable, \( \text{INVENT} \) is inventory, \( \text{SALES} \) is total sales, \( \text{COGS} \) is cost of goods sold; \( \phi_1 \) and \( \phi_i \) represent industry and year fixed effects respectively.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>( \chi^2 )-statistic</td>
</tr>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-1.436</td>
</tr>
<tr>
<td>SINFIRM</td>
<td>-</td>
<td>0.236</td>
</tr>
<tr>
<td>OWNER</td>
<td>+</td>
<td>-0.070</td>
</tr>
<tr>
<td>HERFINDEX</td>
<td>+/-</td>
<td>1.003</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-</td>
<td>-0.172</td>
</tr>
<tr>
<td>MARGIN</td>
<td>+/-</td>
<td>0.055</td>
</tr>
<tr>
<td>LEV</td>
<td>+/-</td>
<td>0.502</td>
</tr>
<tr>
<td>OC</td>
<td>-</td>
<td>-0.000</td>
</tr>
<tr>
<td>SIZE</td>
<td>+</td>
<td>0.232</td>
</tr>
</tbody>
</table>

Pseudo- \( R^2 \) 11.35% 9.65%

# of Observations 14,513 14,513
Table 6
Regression Specification of Sin Firms and Loss Recognition

Panel A: Pooled Levels Regression Specification

\[
\Delta W_{Ct} = \theta_0 + \theta_I + \theta_tCFO_t + \theta_2CFO_{t-1} + \theta_3CFO_{t+1} + \theta_4DCF_{Ot} + \theta_5DCF_{Ot} \times CFO_t + \theta_6DCF_{Ot} \times CFO_t \times SIN + \psi
\]

\[
ACC_t = \theta_0 + \theta_I + \theta_tCFO_t + \theta_2\Delta SALES_t + \theta_3PPE_t + \theta_4DCF_{Ot} + \theta_5DCF_{Ot} \times CFO_t + \theta_6DCF_{Ot} \times CFO_t \times SIN + \psi
\]

where \(\Delta W_{Ct}\) is the change in working capital accounts as disclosed on the statement of cash from operations, measured as the increase in accounting receivable plus the increase in inventory less the decrease in accounts payable and accrued liabilities plus the decrease in taxes accrued plus the increase (decrease) in other assets (liabilities) deflated by beginning total assets; \(CFO_{t+1}, CFO_{t+1}\) and \(CFO_{t}\) are the cash from operations in year \(t-1, t+1\) and \(t\), respectively, minus the accrual portion of extraordinary items and discontinued operations in the respective years; \(DCF_{Ot}\) is an indicator variable equal to 1 if \(CFO_t < 0\); \(SIN\) is an indicator variable, which equals one if the firm is categorized as a sin firm; \(ACC_t\) is total accruals scaled by average total assets; \(\Delta SALES_t\) is the change in sales deflated by beginning total assets; and \(PPE_t\) is property, plant, and equipment deflated by beginning total assets. \(\theta_I\) and \(\theta_T\) represent industry and time fixed effects.

<table>
<thead>
<tr>
<th></th>
<th>Dechow-Dichev Model</th>
<th></th>
<th>Jones Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t-statistic</td>
<td>Coefficient</td>
<td>t-statistic</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.010</td>
<td>2.47</td>
<td>-0.048</td>
<td>-6.95</td>
</tr>
<tr>
<td>(CFO_t)</td>
<td>-0.435</td>
<td>-41.52</td>
<td>-0.426</td>
<td>-25.16</td>
</tr>
<tr>
<td>(CFO_{t-1})</td>
<td>0.140</td>
<td>28.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(CFO_{t+1})</td>
<td>0.144</td>
<td>29.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\Delta SALES_t)</td>
<td></td>
<td></td>
<td>0.110</td>
<td>32.71</td>
</tr>
<tr>
<td>(PPE_t)</td>
<td></td>
<td></td>
<td>-0.021</td>
<td>-5.91</td>
</tr>
<tr>
<td>(DCF_{Ot})</td>
<td>0.018</td>
<td>9.12</td>
<td>0.000</td>
<td>0.06</td>
</tr>
<tr>
<td>(DCF_{Ot} \times CFO_t)</td>
<td>0.232</td>
<td>20.38</td>
<td>0.572</td>
<td>30.03</td>
</tr>
<tr>
<td>(DCF_{Ot} \times CFO_t \times SIN)</td>
<td>0.176</td>
<td>4.59</td>
<td>-0.006</td>
<td>-0.09</td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>22.74%</td>
<td></td>
<td>14.59%</td>
<td></td>
</tr>
<tr>
<td># of Observations</td>
<td>14,513</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6 (continued)
Regression Specification of Sin Firms and Loss Recognition

Panel B: Pooled Changes Regression Specification

\[
\Delta WC_t = \theta_0 + \theta_1 + \theta_1 CFO_t + \theta_2 CFO_{t-1} + \theta_3 CFO_{t+1}
+ \theta_4 D\Delta CFO_t + \theta_5 D\Delta CFO_t \ast \Delta CFO_t + \theta_6 D\Delta CFO_t \ast \Delta CFO_t \ast SIN + \psi \]  

\[
ACC_t = \theta_0 + \theta_1 + \theta_1 \Delta CFO_t + \theta_2 \Delta SALES_t + \theta_3 PPE_t 
+ \theta_4 D\Delta CFO_t + \theta_5 D\Delta CFO_t \ast \Delta CFO_t + \theta_6 D\Delta CFO_t \ast \Delta CFO_t \ast SIN + \psi \]  

where \(\Delta WC_t\) is the change in working capital accounts as disclosed on the statement of cash from operations, measured as the increase in accounting receivable plus the increase in inventory less the decrease in accounts payable and accrued liabilities plus the decrease in taxes accrued plus the increase (decrease) in other assets (liabilities) deflated by beginning total assets; \(CFO_{t-1}, CFO_{t+1}\) and \(CFO_t\) are the cash from operations in year \(t-1, t+1\) and \(t\), respectively, minus the accrual portion of extraordinary items and discontinued operations in the respective years; \(D\Delta CFO_t\) is an indicator variable equal to 1 if \(\Delta CFO_t < 0\); \(SIN\) is an indicator variable which equals one if the firm is categorized as a sin firm; \(ACC_t\) is total accruals scaled by average total assets; \(\Delta SALES_t\) is the change in sales deflated by beginning total assets; \(\Delta CFO_t\) is the change in cash from operations deflated by beginning total assets; and \(PPE_t\) is property, plant, and equipment deflated by beginning total assets. \(\theta_I\) and \(\theta_t\) represent industry and time fixed effects.

<table>
<thead>
<tr>
<th></th>
<th>Dechow-Dichev Model</th>
<th>Jones Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t-statistic</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.008</td>
<td>-2.06</td>
</tr>
<tr>
<td>(CFO_t)</td>
<td>-0.267</td>
<td>-32.94</td>
</tr>
<tr>
<td>(CFO_{t-1})</td>
<td>0.108</td>
<td>16.03</td>
</tr>
<tr>
<td>(CFO_{t+1})</td>
<td>0.155</td>
<td>31.25</td>
</tr>
<tr>
<td>(\Delta SALES_t)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PPE_t)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\Delta CFO_t)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(D\Delta CFO_t)</td>
<td>0.017</td>
<td>10.95</td>
</tr>
<tr>
<td>(D\Delta CFO_t \ast CFO_t)</td>
<td>-0.02</td>
<td>-1.67</td>
</tr>
<tr>
<td>(D\Delta CFO_t \ast CFO_t \ast SIN)</td>
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</tr>
<tr>
<td>Adjusted R²</td>
<td>20.02%</td>
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</tr>
<tr>
<td># of Observations</td>
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</tbody>
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