Payoffs to Aggressiveness

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We examine the payoffs to shareholders and CEOs of aggressive real behaviors and aggressive reporting behaviors. Using instruments selected from prior literature to construct latent variables for each aggressiveness construct, we estimate a structural equations model of the associations between the two constructs, and between the constructs and payoffs to shareholders (returns) and to CEOs (compensation). Our approach allows for a link between real aggression and reporting aggression, and separate links between each form of aggression and the payoffs to investors and CEOs. Results show that real aggressiveness and reporting aggressiveness are positively correlated. Further, we show that more aggressive *real* behaviors are associated with *lower* shareholder and CEO payoffs and more aggressive *reporting* is associated with *larger* shareholder and CEO payoffs. We analyze the latter finding in the context of prior research that reports negative market reactions to announcements of adverse reporting events, specifically, restatements. We show that our aggressive reporting measure is associated with a greater likelihood of restatements and that positive long-window pre-event returns exceed the negative returns at the restatement announcement. Our findings suggest that over long horizons, both investors and CEOs of aggressive reporting firms, including firms that experience significant and unusual adverse reporting events, benefit in the form of higher stock returns and higher compensation.

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1. Introduction

We propose and estimate a comprehensive empirical model that links aggressive corporate actions with aggressive financial reporting, and links each type of aggressive behavior with payoffs to investors and to CEOs. We start from the premise that aggressiveness is a possibly stable firm characteristic that is an external manifestation of a combination of largely unobservable factors, including managerial traits, cognitive biases, self-selection, matching and corporate culture. This premise suggests that a propensity toward more aggressive real behavior will be linked to a similar propensity toward more aggressive financial reporting behavior. However, this premise does not imply that aggressive behavior is either beneficial or detrimental; nor does it provide predictions about the payoffs to the two kinds of behaviors.

Using a broad sample of firms for the period 1992-2011, we estimate a structural equations model (SEM) that allows both for an association between latent variables for real aggressiveness and reporting aggressiveness, and for an association between each latent aggressiveness variable and payoffs to CEOs and shareholders. The latent variable for aggressive real behavior is based on measures of investment, acquisition activity, and financing decisions. The latent variable for aggressive reporting behavior is based on income-increasing accounting policy choices, notably depreciation method and inventory valuation method. Our measures of the payoff to shareholders are abnormal returns, which control for changes in risk resulting from aggressive behaviors, and average returns, which do not. Our measures of the payoff to CEOs are salary and total compensation (salary plus contingent pay -- options, bonuses, restricted stock), as well as industry-adjusted versions of these measures. We believe the SEM approach has several advantages: it controls for error in the variables that form the inputs to the latent variables; it does not impose constraints on which variables are informative; and it exploits the available information by simultaneously estimating *both* the correlation between the two latent aggressiveness variables *and* the paths between each aggressiveness variable and each payoff variable. We interpret a positive correlation between the latent variables as support for an aggressive firm-level trait.

Our approach to analyzing the payoffs to aggressive behaviors is based on the idea that these behaviors are common, rational, possibly benign, and not necessarily extreme. Our SEM approach determines statistically the instruments most important to defining each latent variable. The latent variable for real aggression (*RealAgg*) is based on nine instruments: acquisition value, goodwill, amount of goodwill impairment, proceeds of debt issuances, proceeds of equity issuances, capital expenditures, advertising expenditures, R&D expenditures, and leverage. The latent variable for reporting aggression (*ReportAgg*) is based on income-increasing choices of inventory method and depreciation method.[1] Basing our identification of aggressive reporting firms on these two choices, we expect and find that the majority of our sample firm-years are classified as aggressive in terms of financial reporting.

Our main empirical tests show that *RealAgg* and *ReportAgg* are positively correlated. In analyses of the associations between these latent variables and shareholder and CEO payoffs, we find that returns and CEO compensation are *negatively* associated with *RealAgg*, and *positively* associated with *ReportAgg*. Thus, despite the logical inference that both forms of aggressive behavior probably spring from a stable characteristic, they have distinct payoff effects. In particular, CEOs do not benefit, in the form of higher compensation, from aggressive real actions, and neither do shareholders.[2]

Our finding that share returns are larger for more aggressive reporting firms seems at odds with prior research documenting negative returns to announcements of highly aggressive accounting, such as restatements. On an intuitive level, we note that our measure of aggressive reporting is not intended to focus on extreme behavior and, in particular, the kind of non-GAAP reporting that leads to restatements; rather, it is intended to capture reasonably stable income-increasing accounting policy choices. On an empirical level, we analyze returns at events indicating extreme reporting aggression, as proxied by a

[1] In extensions of our tests, we consider a broader set of instruments for reporting aggressiveness, taken from Dichev and Li (2013), that includes, in addition to inventory method and depreciation method, average depreciable life of property, plant and equipment, present value of operating lease obligations, and three variables associated with defined benefit pension plans (rate of compensation increase, expected return on plan assets, and discount rate). Our results are similar. We do not, however, focus on these because the sample is highly constrained by requiring the existence of defined benefit pension plans.

[2] We acknowledge that CEOs might benefit from aggressive real actions in other ways, for example, moving to a larger firm or being appointed to corporate boards.

restatement, and compare to returns earned over long periods preceding the restatement. Our aim is to provide evidence on whether the negative response to a restatement exceeds the positive returns during a long period of aggressive reporting.

After documenting that *ReportAgg* is significantly positively associated with the likelihood of a restatement, we examine long-window returns associated with periods preceding restatements. We use calendar time portfolio regressions to calculate the monthly returns to equally weighted portfolios of firms who disclose a restatement N-months in the future. These calendar time tests go *back* in time to calculate the returns to a shareholder who invested in the firm N months *prior* to the restatement. We find that the cumulative return over the 3-6 years preceding the restatement is significantly larger than the negative reaction to the restatement event. We refine this analysis by measuring returns over the months covered by the misstated financial reports, as reported by AuditAnalytics. On average, shareholders earn 1.21% per month over the (subsequently) restated periods, with a cumulative return of nearly 46%. In contrast, the average cumulative return over the three months centered on the restatement-month disclosure is -1.70%. We interpret these results as suggesting that long-term positive returns to aggressive reporting firms are not eliminated even when the reporting behavior results in a detected GAAP violation and restatement.

We summarize the contributions and results of our study as follows. First, we begin with a broad set of variables to capture aggressive decisions, both in terms of real actions and in terms of accounting policy choices. We use these variables in a structural equations model to define latent variables for two types of aggressive behavior; the results both identify which input variables are most important in defining each aggressiveness latent variable, and whether and how each latent variable is associated with payoffs to shareholders and CEOs. While real aggressiveness and reporting aggressiveness are, as expected, positively correlated, they have distinct and opposing effects on payoffs: real aggressiveness is associated with lower share returns and lower CEO compensation, and reporting aggressiveness is associated with higher returns and higher CEO compensation. We further show that the documented

higher returns to reporting aggressiveness are more than sufficient to offset negative short-window stock market reactions to adverse reporting outcomes, such as restatements.

The rest of the paper is organized as follows. In Section 2 we summarize findings from previous related research and explain how our research is related to this previous work. Section 3 describes the sample and data. Section 4 presents the structural equations modeling results, and Section 5 presents our analysis of the long term returns to restatement firms. Section 6 concludes.

2. Background, previous research, and our approach

We describe results from three literatures that provide a foundation for our analysis. Section 2.1 analyzes research on aggressive real behavior; Section 2.2 describes research on aggressive reporting behaviors including earnings management and GAAP violations; and Section 2.3 describes studies investigating linkages between the two. Section 2.4 describes how our approach builds on and differs from the approaches taken in previous research.

2.1 Research on real aggressiveness

The literature on aggressive real behaviors examines determinants and consequences of these behaviors. Within the determinants literature, researchers have examined whether and how managers, and managerial traits, affect investment decisions and financial policies, sometimes capturing managerial traits in a simple fixed-effects specification (e.g., Bertrand and Schoar, 2003). Motivated by theories rooted in bounded rationality (Simon, 1955), research also links observable and unobservable manager characteristics to corporate actions. For example, upper echelon theory argues that executive perceptions, cognitions and values manifest in the decision making process (Hambrick and Mason, 1984).

One well-studied unobservable managerial characteristic is overconfidence, typically viewed as a cognitive bias. An overconfident manager overestimates the accuracy of his knowledge and information and, as a consequence, underestimates the risk in a project or decision and, therefore, acts less

conservatively.[3] Research shows that overconfidence leads to: greater investment-to-cash flow sensitivity (Malmendier and Tate, 2005a, b); larger capital expenditures (Ben-David, Graham and Harvey, 2013); excessive merger activity (Roll, 1986; Doukas and Petmezas, 2007; Billett and Qian, 2008; Malmendier and Tate, 2008); larger acquisition premia (Hayward and Hambrick, 1997); more use of debt financing (Hackbarth, 2008; Li, 2010; Ben-David et al., 2013); riskier product introductions (Simon and Houghton, 2003), physical plant expansions (Nutt, 1993) and innovation (Staw, 1991).[4]

With regard to outcomes associated with overconfidence, theoretical research shows that *some* overconfidence is benign or even desirable, in the sense of leading to larger payoffs to shareholders (Goel and Thakor, 2008; Gervais, Heaton and Odean, 2011). The reasoning is that overconfidence mitigates a manager's risk aversion by partly offsetting the manager's natural tendency to make overly cautious investment decisions. Contracting is more efficient and less expensive because the overconfident manager is more willing to accept risk. Gervais et al. (2011) show analytically that when overconfidence benefits shareholders, overconfident managers also benefit, and Gervais and Goldstein (2007) show that manager overconfidence is Pareto optimal for shareholders and the manager. An important qualification to these findings is that while *some* overconfidence can benefit both managers and shareholders, *too much* overconfidence can be value-destroying (Goel and Thakor 2008, Gervais, Heaton and Odean, 2011). Similarly, Gervais and Goldstein (2007) find that Pareto optimality is not the outcome when the overconfident manager is also the leader of the firm.

Empirical research on the consequences of overconfidence shows that overinvestment, presumably the result of too much overconfidence, is generally associated with lower shareholder returns (Gervais, 2010). For example, Lang, Stulz and Walkling (1991) and Malmendier and Tate (2008) find

[3] Overconfidence differs from optimism (expecting better outcomes than are warranted), but both lead to the same behavior – a tendency to take on more risky projects (Gervais, 2010). We do not distinguish between overconfidence and optimism.

[4] There is also evidence linking executives' personal behavior to corporate behavior. Cronqvist, Makhija and Yonker (2012) show that personal leverage (as evidenced by house purchases) is associated with corporate leverage. Graham, Harvey and Puri (2013) use psychometric tests to measure executives' underlying psychological traits and attitudes. Among other things, they show that behavioral traits such as optimism and managerial risk-aversion are related to firms' financial policies, and that CEO traits such as risk aversion and time preferences are related to compensation.

that market responses to acquisition announcements are more negative for acquiring firms that are led by overconfident CEOs. Titman, Wei and Xie (2004) find that firms that substantially increase capital investments have subsequent negative adjusted returns. This relation is stronger for firms with higher cash flows and lower debt ratios, consistent with Jensen's (1986) agency arguments.

It is generally difficult to distinguish empirically between outcomes caused by managerial traits and outcomes due to selective hiring (matching) in which firms with certain characteristics such as high growth selectively hire managers with certain characteristics such as overconfidence (Kaplan, Klebanov and Sorensen, 2012).[5] This distinction does not matter for our study, because our focus is on the payoffs to aggressive behavior not the causes. Specifically, it does not matter whether the behavior arises from overconfidence, managerial traits, genetics (Cronqvist, and Siegle, 2014), life experiences (such as military experience, Benmelech and Frydman, 2014), matching, corporate culture, hubris (Roll, 1986), corporate empire-building (Jensen, 1986), or some combination of these.

Our research is related to prior studies that examine both concurrent returns and future returns associated with financing and investment decisions. With regard to financing decisions, numerous studies document a significant negative relation between future returns and both equity and debt financing (Ritter, 1991; Spiess and Affleck-Graves, 1995, 1999; Bradshaw, Richardson and Sloan, 2006). With regard to investment decisions, the evidence depends on the type of investment. For example, Titman, Wei and Xie (2004) document a negative association between capital investments and subsequent returns, and Fairfield, Whisenant and Yohn (2003) find a similar negative association for the change in net operating assets (another proxy for investment).[6] With regard to investments in intangible assets, Chan, Lakonishok and Sougiannis (2001) find no relation between future returns and either R&D spending or advertising spending, except that there is a positive relation for firms with a combination of high R&D

[5] For example, Fee, Hadlock and Pierce (2013) examine firm policy changes after exogenous CEO departures, and find that policy changes do not exhibit abnormally high levels of variability. They interpret this result as evidence against idiosyncratic managerial effects affecting firms.

[6] Penman and Zhu (2014) consider whether the returns to investment and asset growth are due to market mispricing or rational pricing.

intensity and past poor performance. In contrast, Eberhart, Maxwell and Siddique (2004) document positive long term abnormal returns for firms that increased their R&D expenditures.

To summarize, one strand of research on determinants of corporate investment decisions focuses on the possibly benign role of some (unspecified) amount of managerial overconfidence, and shows analytically that a certain amount of overconfidence reduces risk aversion in a beneficial way. Another strand of research documents mixed associations between share returns and corporate investing and financing decisions. We extend this stream of research by focusing on payoffs to both CEOs and shareholders, and by considering both real aggression and reporting aggression, and a possible link between them.

2.2 Research on financial reporting aggressiveness

Research on aggressive financial reporting behavior examines both determinants and consequences, often but not always focusing on aggressive reporting that leads to unusual and extreme reporting outcomes. With regard to determinants, Schrand and Zechman (2012) examine overconfidence and AAER incidence. Davidson, Dey and Smith (2014) and Amir, Kallunki and Nilsson (2014) examine personal CEO factors (for example, criminal records) and restatements or financial reporting quality. Jia, van Lent and Zeng (2013) investigate the role of exposure to testosterone, which has been linked to aggression, risk-seeking and misreporting. Within this literature, results are sometimes sensitive to both the choice of proxy used to measure managerial traits and the type of manager studied. For example, Schrand and Zechman find that indirect overconfidence measures (such as managers' portfolio holdings) show the expected association between overconfidence and greater incidence of AAERs, but other proxies for overconfidence (education level and gender) do not. Amir et al. report significant effects for CEOs but not for CFOs. Davidson et al. report significant results for executives with a criminal record, but not for non-frugal executives (proxied as ownership of luxury goods).

Proxies for financial reporting aggression range from abnormal or discretionary accruals, which can change year-by-year, to accounting method choices, which are reasonably stable, to severe and

unusual adverse outcomes such as restatements and fraud. Each of these proxies represents different research design choices, discussed next.

Accruals proxies: An extensive literature on accruals management encompasses measurement issues, determinants, and outcomes. A commonly used proxy for accruals management, and aggressive reporting, is abnormal or discretionary accruals. Researchers determine abnormal accruals as the residual (the unexplained portion of total accruals) from a model of normal accruals that uses accounting fundamentals such as change in sales and property, plant and equipment as explanatory variables. One common approach is to estimate the model in industry-cross-sections. Positive (negative) abnormal accruals are interpreted as income-increasing (income-decreasing) earnings management.

Numerous studies examine whether more-positive abnormal accruals are associated with incentives to manage earnings upwards in a specified reporting period, for example, to meet or beat analyst forecasts or to reach bonus targets. The weight of the evidence from this research supports the existence of managerial responses to the incentives embodied in these benchmarks, in the form of income-increasing abnormal accruals. Research has also examined the association between accruals and shareholder returns. Subramanyam (1996) documents a positive association between discretionary accruals and concurrent returns, and Frank, Lynch, Rego and Zhao (2012) find that discretionary accruals are associated with larger values of Tobin's Q. There is also some evidence that abnormal accruals are negatively associated with future returns (Sloan, 1996 and Xie, 2001; however, Francis and Smith, 2005, argue that this result is driven by a flawed measure of accruals).

Accounting method choice: Research on accounting method choice has for the most part focused on its determinants. For example, Skinner (1993) scores three accounting choices (depreciation method, inventory flow assumption, and goodwill amortization period) as income increasing versus income-decreasing, and calculates an overall accounting choice score. He finds that income-increasing choices are associated with firms that are smaller, more levered, and more likely to have accounting-based bonus plans, and concludes that a firm's investment opportunity set has only an indirect effect on accounting choice. Using an aggregate score based on inventory valuation method and depreciation method, Bowen,

DuCharme and Shores (1995) examine how implicit claims, in the form of arrangements between a firm and its customers, suppliers, employees and short-term creditors, are linked to accounting policy choice. Their results suggest that managers respond to these implicit claims by choosing income-increasing accounting methods. Finally, Dichev and Li (2013) investigate the relation between 1-3 year sales growth and several accounting policy choices. In contrast to their prediction that the ability of income-increasing accounting choices to increase income depends on growth,[7] they find no relation between growth and accounting aggressiveness as proxied by income-increasing policy choices; nor do they observe any consistent correlation pattern across accounting choices.

Adverse reporting events: Research has also analyzed aggressive accounting, proxied by unusual and extreme accounting practices that violate US GAAP. The focus is typically on adverse outcomes of aggressive reporting, including restatements of financial reports, accounting and auditing enforcement releases (AAERs), allegations and determinations of fraud, and shareholder lawsuits alleging defective accounting. Research documents significant negative reactions to announcements of adverse reporting events (Palmrose, Richardson and Scholz, 2004; Hennes, Leone and Miller, 2008; Dechow, Sloan and Sweeney (1996). Hribar and Jenkins (2004) document increases in restating firms' costs of equity following the restatement, consistent with shareholders demanding a higher return for the incremental risk. With regard to consequences to managers of adverse reporting events, the evidence is mixed. Beneish (1999) and Agrawal, Jaffe and Karpoff (1999) find little evidence of increased CEO turnover following fraud and/or GAAP violations. However, Desai, Hogan and Wilkins (2006) find that about 60% of restating firms experience some form of top manager turnover in the two years following the restatement, as compared to 35% turnover for a matched sample of non-restating firms.

[7] For example, the choice between straight-line depreciation and accelerated depreciation will have no effect on income if the balance in gross property, plant and equipment is constant over time. In addition to depreciation, Dichev and Li examine inventory valuation method, useful life of PPE, full cost versus successful efforts (for oil exploration firms), purchase versus pooling accounting (for firms engaged in acquisitions when pooling was permitted), capital leases versus operating leases, and estimates reported for defined benefit pension plans (the rate of compensation increase, the expected rate of return, and the discount rate).

2.3. Research on the interaction between real aggressiveness and reporting aggressiveness

Research that posits a connection between aggressive real decisions and aggressive reporting decisions[8] includes Roychowdhury (2006), who examines whether and how managers make short-term reversible operating decisions, such as overproduction or cutting discretionary spending, to manage earnings upward. Zang (2012) considers how managers might trade-off earnings management by making short-term operating decisions and earnings management by accruals manipulations, and finds evidence that the two are treated as substitutes.

McNichols and Stubben (2008) find that firms experiencing negative reporting events (AAERs, restatements, and shareholder lawsuits) over-invest during the period of aggressive reporting behavior. Using abnormal accruals as their proxy for reporting aggressiveness, Frank, Lynch and Rego (2009) find a significant positive association between tax aggressiveness and reporting aggressiveness. Schrand and Zechman (2012) examine the link between CEO overconfidence and aggressive reporting as proxied by AAER incidence. Using a proxy for CEO overconfidence based on variables identified in the finance literature as associated with overconfidence (overinvestment relative to the industry, acquisition activity, and leverage), they find that overconfident CEOs have a higher probability of receiving an AAER than less confident CEOs.

Finally, Frank, Lynch, Rego and Zhao (2012) investigate whether firms with greater tax aggressiveness and financial reporting aggressiveness are characterized by more risk-taking environments. They find associations among performance-matched discretionary accruals (their proxy for reporting aggressiveness), a measure of tax aggressiveness (Frank, Lynch and Rego, 2009), and their proxy for risk-taking environments before the passage of the Sarbanes-Oxley Act (SOX) but not after.

[8] Several studies examine the association between investment decisions and reporting quality, finding that firms with poorer reporting quality overinvest: Biddle, Hilary and Verdi (2009) measure reporting quality using the FOG index which captures readability of the financial statements; Bushman, Piotroski and Smith (2011) use timely recognition of losses; Biddle and Hilary (2006) measure reporting quality using a combination of loss avoidance, earnings smoothing, timeliness, and the inverse of a conservatism measure; and Balakrishnan, Core and Verdi (2014) use six measures: bid-ask spread, timely loss recognition, the length of the MD&A section, number of 8-Ks filed, number of management forecasts, and a composite score. We are cautious about linking these results to our own research because it is not obvious that reporting quality as captured by these studies maps into the construct of interest in our study -- reporting aggressiveness.

They also find that shareholders placed a premium on reporting aggressiveness, but not risk-taking environments, but only in the pre-SOX period.

2.4. Relation between our study and previous research

Similar to Frank et al. (2012), we take the perspective that aggressiveness is a possibly stable firm characteristic, not necessarily specific to any individual manager. This perspective allows for aggressive behavior to arise from any combination of cognitive biases, managerial traits and other forces, such as self-selection and matching of corporate culture (Van den Steen, 2010). We intentionally select a measure of reporting aggressiveness that is relatively stable -- accounting method choice -- rather than one that changes frequently, such as abnormal accruals.[9] Our measure of reporting aggressiveness is also intentionally based on commonly occurring, within-GAAP policy choices, not on extreme or unusual behavior that is demonstrably or allegedly outside GAAP. Thus, our reporting aggressiveness measure is aligned with our real aggressiveness behavior which is similarly based on commonly-occurring financing and investing decisions, and not on extreme or unusual corporate behaviors such as bribe-paying, money-laundering or other forms of aggressive (and illegal) behavior.

Relative to previous research, we view our approach as more comprehensive, in the sense that we examine how real aggressiveness and reporting aggressiveness are related to each other, and how each influences payoffs to shareholders (average monthly returns and abnormal returns) and to CEOs (raw and abnormal compensation), in a single comprehensive structural equations estimation. We expect that real aggressiveness and reporting aggressiveness are positively correlated, but we do not make a prediction as to how each type of aggressive behavior affects payoffs to CEOs and shareholders.

Prior research suggests that real aggressiveness and reporting aggressiveness need not have the same associations with payoffs to CEOs and shareholders, and might have no association at all. The research also suggests that results may be sensitive to the researcher's choice of proxies. For example, research examining the market consequences of excessive capital expenditures, acquisition behavior, and

[9] In our sample, we identify 1.6% observations of changes in inventory method and 1.3% observations of changes in depreciation method.

external financing often finds these behaviors are value destroying (Gervais, 2010), whereas research examining the consequences of R&D and advertising spending finds no association with subsequent returns, or sometimes, a positive association (Chan, Lakonishok and Sougiannis, 2001; Eberhart, Maxwell and Siddique, 2004). Similarly, results of analyses of the link between shareholder returns and aggressive reporting behavior are proxy dependent. While research reports consistently negative returns at announcements of adverse reporting outcomes such as restatements, studies that measure reporting aggressiveness with accruals sometimes find a positive, or no, relation between discretionary accruals and current or future returns.

Relative to previous research, we use latent variables to measure each construct and focus on non-extreme behaviors. Our latent variables are derived from a broad set of instruments linked in previous research to aggressive real behavior and aggressive reporting behavior. This approach allows us to build on previous research that uses a variety of different instruments and also allows us to speak to which of the instruments are most important in defining the construct and in influencing our set of payoff variables.

As previously mentioned, we focus on accounting method choice rather than negative reporting events or abnormal accruals. We create an *ex ante* observable instrument for aggressive reporting behavior that is available for a large sample of firms and is relatively stable over time; in contrast, negative reporting events are extreme, unusual, and not known *ex ante*. We do not use abnormal accruals because they are measured with error, have a forced distribution determined by the regression procedure used to estimate normal accruals, and by their nature, reverse over short horizons; the reversals confound the interpretation that large positive accruals are more aggressive than large negative accruals. Finally, our focus on relatively stable policy choices allows us to avoid measures of aggressiveness derived from returns and thereby allows us to test whether aggressive behavior influences shareholder returns. Thus, we do not consider inverse measures of conservatism, such as those used by Basu (1997) or Ball, Kothari and Robin (2000).[10]

[10] Penman and Zhang (2002) estimate a measure of conservatism based on a balance sheet approach, which includes information about the firm's LIFO reserve and estimated R&D assets and estimated advertising assets. We do not

Finally, we use a structural equations model (SEM) to estimate the latent aggressiveness variables as well as the correlation between the two latent variables themselves as well as the paths between each of the two latent variables and payoffs. SEM is a powerful approach for detecting the sign, magnitude and significance of these associations, if they exist, because it controls for error in the variables, does not impose constraints on which variables are informative or how they are informative, and maximally uses information by simultaneously estimating the latent variables and the paths. This approach also sheds light on which types of real and reporting decisions have the greatest influence on payoffs.

We estimate the SEM given by equations (1)-(3) using maximum likelihood estimation with Newton-Raphson iteration:

$$Inst\_Real(k)_{i,t} = r_k \times RealAgg_{i,t} + v_{k,i,t} \quad (1)$$

$$Inst\_Report(j)_{i,t} = a_j \times ReportAgg_{i,t} + u_{j,i,t} \quad (2)$$

$$Payoff_{i,t} = p_1 \times RealAgg_{i,t} + p_2 \times RepAgg_{i,t} + \varepsilon_{i,t} \quad (3)$$

where k indexes the set of instruments for the latent variable for real aggression (*RealAgg*);

j indexes the instruments for the latent variable for reporting aggression (*ReportAgg*)

As described in Section 3, *Payoff* is measured as shareholder returns (monthly raw return or monthly abnormal return) or CEO compensation (salary or total compensation, both raw and industry-adjusted).

For each latent variable (*RealAgg* and *ReportAgg*), one instrument is used as the anchor variable that fixes the scale of the latent variable. For *RealAgg*, the anchor variable is a measure of acquisition activity (*Acquisition*) and for *ReportAgg* the anchor variable is the choice of inventory flow method (*InvMethod*). The coefficients on the anchor variables (r_1 and a_1) are set to one in the estimation. All other raw coefficient estimates ($r_{k>1}$, $a_{j>1}$, p_1, p_2) depend on the choice of anchor variable. To make the coefficients interpretable, we report standardized coefficient estimates that do not depend on the anchor variable and are directly comparable. Using p_1 as an example, the standardized coefficient (p_1) is

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use this measure because it blends reporting aggressiveness and real aggressiveness, and therefore does not allow us to distinguish between the two types of behavior.

calculated as $p_1 = p_1^{raw} \times \frac{\sigma_{RealAgg}}{\sigma_{Payoff}}$, where p_1^{raw} is the raw coefficient estimate, $\sigma_{RealAgg}$ is the standard deviation of the latent *RealAgg* variable, and σ_{Payoff} is the standard deviation of the payoff variable. The standardized coefficients are directly comparable in magnitude; the choice of anchor variable has no influence on the sign, magnitude or significance of the standardized coefficients.

The SEM approach jointly estimates the two latent variables for real aggression and reporting aggression, as well as the associations between the latent variables themselves and between each latent variable and the payoff variables. This approach differs from a two-stage procedure that first uses factor analysis to identify a common factor, and then tests for an association between that common factor and a payoff variable. Factor analysis examines the shared variation among instrument variables to define the common factor. In contrast, SEM uses *all* variables in a single estimation of the system of equations and seeks to maximize the path coefficients p_1 and p_2, as well as the correlation ρ between the two latent variables themselves. Thus, SEM uses both a different objective function simultaneously uses information in all variables. Overall, these features of the SEM approach imply that while SEM does not force or bias toward finding associations among *RealAgg*, *ReportAgg*, and *Payoff*, it uses all the information in the data to estimate the sign, magnitude and significance of any such associations. In short, if these associations exist, the use of SEM increases the likelihood of detecting them.

3. Sample and Data

3.1 Sample description

Our sample period is 1992-2011. To be included in the sample, firms must have data on stock returns for at least a full year preceding and following, their fiscal year-end, as well as data on lagged adjusted total assets, used as a scalar.[11] As shown in Table 1, Panel A, a total of 105,434 firm-years (13,460 firms) meet these criteria. Of these, we eliminate 49,663 firm-years (6,014 firms) with missing

[11] Following Bowen et al. (1995), adjusted total assets equals total assets plus the LIFO reserve plus accumulated depreciation, depletion and amortization. If either the LIFO reserve or accumulated depreciation/amortization is missing, we set the values of these variables to zero rather than delete the observation. Conceptually, the adjusted total assets measure is independent of the depreciation method and inventory flow assumptions.

data on depreciation method or inventory flow method; although we do not explicitly eliminate any industries, these selection criteria eliminate certain industries systematically. The resulting Returns Sample contains 55,771 firm years (7,446 firms); we use this sample to examine shareholders returns as the payoff variable. When we impose the requirement of CEO compensation data on ExecuComp, the resulting Compensation Sample contains 18,849 firm-years (1,951 firms); we use this sample to examine CEO compensation as the payoff variable. Table 1, Panel B shows that both the Returns Sample and the Compensation Sample are fairly balanced over the sample period.

Appendix A describes all variables, including the instruments used to estimate the two aggressiveness latent variables. All instruments are measured at the fiscal-year level. Sample size is not reduced by data requirements for the real aggressiveness instruments because we assign a zero value to missing data items. In contrast, data on the instruments for reporting aggression are sometimes missing and it may not be appropriate to assign zero to missing values, particularly in the case of the three pension instruments (management estimates of rate of compensation increase, expected return on plan assets, and discount rate). For these pension instruments, a missing value can mean the firm does not have a defined benefit pension plan, not that the amount of the variable is unknown.

Including pension estimates as instruments effectively restricts the sample to firms with defined benefit pension plans. As displayed in Table 1, the Returns Sample reduces to 11,559 firm-year observations (1,723 firms) and the Compensation Sample reduces to 6,716 firm-year observations (823 firms). To avoid such a severe reduction in sample sizes, we estimate the financial reporting aggressiveness latent variable using only two instruments, inventory method and depreciation method. Results based on the full set of instruments for the more restrictive samples show similar results and are not tabulated.

3.2 Instrumental variables

The nine instruments included in the estimation of the real aggression latent variable are: acquisition value, increment to goodwill (a proxy for over-spending), goodwill impairment charge,

proceeds of debt issuances, proceeds of equity issuances, capital expenditures, advertising expenditures, R&D expenditures, and leverage. Appendix A details the calculation of each instrument.

For the instruments included in the estimation of the reporting aggression latent variable, we follow Bowen, DuCharme and Shores' (1995) scoring of incoming-increasing accounting policy choices. For depreciation method choice, *DepMethod* =1 if the firm uses straight line (most aggressive), 0 if the firm uses accelerated depreciation (least aggressive), and 0.5 if the firm uses a combination of the two. For our main sample, 84% of firm-years report straight-line, 2% report accelerated, and 14% report a combination. For inventory method (*InvMethod*), FIFO is coded as 1 (most aggressive), LIFO as 0 (least aggressive); and average cost as 0.5. For our main sample, 64% report FIFO, 14% report LIFO and 22% report average cost. In contrast to Bowen et al., we do not create an aggregate score equal to the sum of *DepMethod* and *InvMethod*. Rather, we treat each variable separately so that we can assess the relative impact of each accounting choice on the latent variable. Alternatively stated, summing the two variables assumes that each accounting choice has equal weight in measuring reporting aggression; we allow the properties of the data to determine the weights.

Appendix A also describes the returns and compensation payoff variables. We measure firm-specific returns over two intervals: the 12-months of the concurrent fiscal year (m=-11,0) where month 0 is the fiscal year end month, and the 12-months following fiscal year end (m=+4,+15). For each interval, we calculate the average raw return, *AvgReturn*, equal to the average monthly return over the 12-month interval, and the average abnormal return, *AbnReturn*, equal to the intercept from firm-specific, 3-factor regressions of monthly returns on the market risk premium, SMB and HML. The estimation period for abnormal returns is either months (-11,0) or months (+4,+15). In calculating *AbnReturn*, we estimate the weights on the risk factors over the estimation period; we do not restrict the weights to those estimated in a prior period. We note that this approach is conservative as the estimated risk coefficients are based on *future* returns. *AvgReturn* and *AbnReturn* are directly comparable as monthly returns, except *AvgReturn* does not control for risk factors and *AbnReturn* does. If aggressive behavior manifests in greater

systematic risk, we expect that our aggressiveness constructs will be more strongly associated with *AvgReturn* than with *AbnReturn.*

CEO compensation data are from ExecuComp, which in turn collects information from annual proxy statements (Form DEF14A). We calculate two compensation variables: base salary and total compensation (base salary, cash bonuses, other annual and deferred compensation, long-term incentive plan payouts, restricted stock grants, and stock options grants). We examine both salary (*Salary*) and total compensation (*TotalComp*) to provide separate evidence on components of total compensation that are, and are not, related to risk (for example, stock options versus base salary). We measure abnormal salary, *AbnSalary* (abnormal total compensation, *AbnTotalComp*) by subtracting from each firm-specific measure the mean value of *Salary* (*TotalComp*) for members of that firm's 2-digit SIC code for the same fiscal year. The industry-adjusted compensation variables are scaled by adjusted total assets, and multiplied by 100 (so expressed as a percentage of adjusted total assets).

Descriptive statistics on the reporting aggressiveness instruments, real aggressiveness instruments and payoff variables are reported in Table 2. Panel A shows information for the Returns Sample, and Panel B shows information for the Compensation Sample. Instruments for each aggressiveness construct do not appear to differ markedly across the two samples. For example, average capital expenditures are about 4.6% of adjusted total assets for both samples, and both samples show roughly similar acquisition activity and external financing activity. The payoff variables are also similar: for both samples, average monthly returns are about 1.4%, and average abnormal returns are about 0.4%. Both mean and median abnormal salary and abnormal total compensation are negative; the standard deviations of both compensation variables are large relative to the means, indicating substantial dispersion in compensation outcomes.

4. SEM Tests and Results

We estimate equations (1)-(3) using the nine instruments for real aggressiveness and the two instruments for reporting aggressiveness. The latent variables for each aggressiveness construct are

estimated simultaneously with the association of each latent variable with each of the two payoffs. We report separate results for each payoff measure. Panel A, Table 3 shows the coefficient estimates and t-statistics for each instrument, for the returns payoff variables (*AvgReturns* and *AbnReturns*) estimated using the Returns Sample. Panel B shows results for the CEO payoff variables (*Salary*, *TotalComp*, *AbnSalary* and *AbnTotalComp*) estimated using the Compensation Sample.

Turning first to shareholder payoff variables (Panel A), we find that all nine real aggressiveness instruments are significant in defining the latent variable, *RealAgg*. The most significant instruments, with t-statistics exceeding 80, are related to acquisition activity, amount of goodwill (a proxy for overpayment) and debt issuances. Variables capturing goodwill impairments, capital expenditures, R&D and advertising spending, leverage and stock issuances are also significant at the 0.01 level or better in determining the latent variable. Of these variables, goodwill impairments, R&D and advertising spending and stock issuances appear with negative signs, indicating less aggressive behavior. The coefficient estimates for both accounting policy choices are positive and significant (t-statistics exceeding 6), indicating that income-increasing inventory method choices and depreciation choices contribute to more reporting aggressiveness, as captured by larger values of the latent variable for reporting aggressiveness, *ReportAgg*. With regard to the CEO payoff variables (Panel B), results are similar to those shown in Panel A. The exception is that capital expenditures appear with a negative sign and R&D spending appears with a positive sign. Results are broadly similar whether we consider salary, abnormal salary, total compensation or abnormal total compensation.

Table 4, Panel A reports our main SEM results from joint estimation of the latent variables, the correlations between the latent variables, and the path coefficients between each latent variable with the payoff variable. We report the correlation coefficient and t-statistic between *RealAgg* and *ReportAgg* (ρ), as well as the path coefficients and t-statistics between each of these latent variables and the payoff variables (p_1 for *RealAgg* and p_2 for *ReportAgg*). We report the magnitude and significance of $p_2 - p_1$, as a formal test of whether real aggressiveness and reporting aggressiveness have different effects on payoffs.

Our findings are summarized as follows. First, $\rho > 0$ (t-statistics range between 4.92 and 8.09), indicating that *RealAgg* and *ReportAgg* are positively correlated, irrespective of the payoff variable. The magnitudes of the correlation coefficients are approximately 0.06 to 0.08 when the payoff is returns and approximately 0.13 to 0.15 when the payoff is CEO compensation. We interpret this positive association as consistent with the view that both real and reporting aggressiveness are, to some extent, similar manifestations of (unobservable) firm characteristics. Second, $p_1 < 0$ and $p_2 > 0$, significant at the 0.01 level or better, indicating that shareholder returns measures and CEO compensation measures are *negatively* associated with *RealAgg* and *positively* associated with *ReportAgg*. The difference between the two associations, $p_2 - p_1$, is reliably positive for all payoff measures (t-statistics range between 6.39 and 19.39).

The results also suggest that the associations between *RealAgg* and shareholder payoffs are smaller in magnitude for abnormal returns than for raw returns. However, this is not the case for the associations between *ReportAgg* and returns, where associations are similar in magnitude for raw and abnormal returns. We interpret these differences in magnitudes as suggesting that a component of aggressive real behavior is captured by the risk proxies in the 3-factor model; that is, in the firm-specific coefficients on the market risk premium, SMB and HML. In the case of CEO payoffs, the associations are consistently negative and roughly similar in magnitude for adjusted and unadjusted compensation.

Results reported in Table 4, Panel A do not condition on possible industry or time period effects. To take account of these possibilities, Table 4, Panel B reports the results of a second SEM estimation that uses industry-year-adjusted values of the instruments. These results are linked to the spirit of the overconfidence literature, where some researchers measure firm-specific overconfident behavior relative to an industry benchmark (i.e., over-investing firms invest more than other firms in their industries). The industry-year adjustments also control for industry effects in accounting choices. When we re-estimate the structural equations model using industry-year-adjusted instruments, the path coefficients and t-statistics are generally smaller in magnitude than the results obtained using the unadjusted instruments reported in

Panel A. There are, however, no changes in either signs or significance levels of the path coefficients, so there is no change in inferences.

We conducted four additional analyses to determine the sensitivity of our results to changes in research design choices. First, and as noted earlier, we find similar results when we include three estimates required by GAAP for defined benefit pension arrangements as instruments for reporting aggressiveness. Specifically, in all cases we find $\rho > 0$, $p_1 < 0$, $p_2 > 0$ and $p_2 - p_1 > 0$ (results not tabulated).

Second, we limit the instruments used to estimate the real aggressiveness latent variable to three that are most stable and critical in the estimations: *Acquisitions*, *Goodwill* and *Debt_Issuance* and repeat the tests in Tables 3, 4 and 5 using this reduced set of instruments. The results, not tabled, are similar in all respects to those reported.

Third, to determine the effect of jointly estimating the latent variables, we estimated SEMs that include only one latent variable at a time. That is, we estimated equations (1) and (3) in one test, and equations (2) and (3) in a second test. The difference between the results of these single latent variable estimations and the results of the full SEM estimation provides insight into the extent to which each latent variable influences the other. The results of the single SEM estimations are reported in the leftmost columns of Table 5, and results for the full SEM estimations are shown in the rightmost columns of Table 5, reproduced from Table 4. Panel A shows results for unadjusted instruments, and Panel B shows results for industry-year adjusted instruments. A comparison of the path coefficients (p_2 and p_1) from the single estimation with their counterparts from the joint estimation reveals that all coefficients are of the same sign, and, with one exception, of similar magnitude and significance. The exception is p_2 for returns payoffs, where the association between *ReportAgg* and returns is more pronounced when instruments for *RealAgg* are also included in the estimation.

Fourth, we applied an alternative statistical technique for evaluating the significance of accounting choices. Our main tests (Table 4) use the inventory flow policy choice and the depreciation method choice as defined and coded by Bowen et al. (1995). This approach assumes that the coded values

themselves, as well as the distance between values, are meaningful. While we believe the values capture an ordinal ranking of reporting aggressiveness (1>0.5>0), the values themselves are *ad hoc* and the distances between these values are not interpretable. To address these concerns, we use a weighted-least-squares estimation that treats these choice variables as categorical ordinal variables (1>0.5>0), but does not make use of the values or of the distance between the values. Results from the weighted-least-squares estimation (not tabled) are similar in all respects to those reported.[12]

In summary, we find consistent evidence that both shareholders and CEOs benefit from reporting aggressiveness, in the sense of receiving larger payoffs, but neither stakeholder group benefits from real aggressiveness. The finding that shareholders benefit from a certain amount of reporting aggressiveness is interesting in light of prior research that documents significant *negative* market reactions to announcements of unusual and extreme aggressive reporting, such as restatements. We explore the relation between these two findings in the next section.

5. Analysis of Negative Reporting Events

We begin by investigating the association between the latent variable, *ReportAgg*, and the incidence of unusual and extreme aggressive reporting, including GAAP violations, as captured by restatements. We identify 5,566 restatement events from AuditAnalytics and the GAO database over 1992-2011. We eliminate duplicate observations but retain firms that issued multiple distinct restatements. As shown in Table 1, Panel B, the Restatement Sample observations are not balanced across years; there are fewer than 100 restatements per year during 1992-2011, over 400 per year during 2000-2005, and approximately 220-230 per year during 2008-2011. Given that there are thousands of SEC registrants, restatements are unusual events, even in 2002-2004 when there are over 600 restatements per year.

[12] While the weighted least squares approach is more appealing from a theoretical perspective, we do not report these as our main results because it requires additional distributional assumptions, which might not be met in our applications (Byrne, 2012). In addition, the actual bias in path coefficient estimates when treating ordinal variables as continuous is likely to be small in many applications. The insensitivity of our results to the treatment of ordinal choice variables lends support to this assertion for our data and models.

Panel A, Table 6 shows the incidence of restatements related to the choice of depreciation method, and Panel B shows similar information for inventory method. Panel C aggregates the two choices using Bowen et al.'s aggregate score (*AGG_SCORE*), equal to the sum of *DepMethod* and *InvMethod*. For all three measures, we find a greater incidence of restatements for more aggressive choices than for less aggressive choices. Moreover, the relation is monotonic across the categories.

Panel D examines the incidence of restatements for quintiles formed based on the values of the latent variable for reporting aggressiveness, *ReportAgg*. These data show that more aggressive firms have a greater incidence of restatements, and the effects are driven by the top and bottom quintiles. Specifically, 16.55% of restating firms are in the least aggressive quintile of firms, compared to 22.19% for the most aggressive quintile. The three middle *ReportAgg* quintiles each have about 20% of restating firms. These results do not imply that the latent variable, *ReportAgg*, is a poor measure of reporting aggressiveness relative to the accounting choices individually or their sum. Because *ReportAgg* is estimated jointly with the real aggressiveness latent variable *RealAgg*, and jointly with the associations between the latent variables and the payoffs, *ReportAgg* is intended not merely to capture reporting aggressiveness but to capture a form of reporting aggressiveness that displays maximal associations with payoffs and with *RealAgg*. Overall, we interpret these results as supporting the construct validity of *ReportAgg*.

We extend the descriptive analysis in Table 6 by examining whether *ReportAgg* is positively associated with the probability of a restatement. These tests replace the *Payoff* variable in equation (3) with an indicator variable for restatement events: *Restatement*=1 if the firm announced a restatement in year t, and 0 otherwise. Because we expect that more aggressive reporting firms are more likely to experience restatements, we predict that the path coefficient on *ReportAgg* is positive, $p_2 > 0$. We have no prediction about the association between *RealAgg* and the likelihood of a negative reporting event (p_1). We continue to predict that *ReportAgg* and *RealAgg* are positively correlated ($\rho > 0$). Because *Restatement* is a binary payoff variable, we estimate equations (1)-(3) with a probit SEM using weighted least squares.

Results for logit estimations are very similar. We tabulate only the probit SEM results because these models are computationally more efficient and more tractable (MacKinnon, 2008).

Results of the probit SEM are reported in Table 7. We report results for the unadjusted model (Panel A) and for a model that adjusts all instruments for industry-year means (Panel B). We find that *ReportAgg* and *RealAgg* continue to be positively correlated with each other (ρ = 0.0664 in Panel A and 0.0717 in Panel B, with t-statistics exceeding 5). The association between *RealAgg* and restatements is positive in the unadjusted estimation (p_1 =0.0162, t-statistic =2.79) and insignificant in the industry-adjusted tests (p_1 =0.0031, t-statistic = 0.52). In contrast, *ReportAgg* is positive and significant in both estimations; the path coefficients are p_2 = 0.0719 and p_2 = 0.0947 in Panels A and B, respectively, with t-statistics exceeding 6. The difference in path coefficients, p_2 - p_1, is also significantly positive for both estimations. These results, and those in Table 6, establish a positive association between *ReportAgg* and negative reporting events (restatements).

Our second analysis seeks to reconcile the positive association between future returns and *ReportAgg* (documented in Table 4) with prior studies' findings of negative market reactions at restatement announcements. One possible explanation derives from the nature of our aggressive reporting latent variable, which is based on within-GAAP accounting policy choices that do not represent extreme outcomes of the sort that systematically lead to restatements. Under this explanation, the majority of our sample firms identified as having made relatively aggressive accounting policy choices report aggressively, but not extremely so, and not outside the boundaries of GAAP. Stated differently, our broad sample blends extremely aggressive reporters (with negative returns associations, specifically at restatement announcements) with more moderate aggressive reporters (with, on average, positive returns).

To test this explanation, we re-estimate equations (1)-(3) including only Returns Sample firms that experienced a restatement at some point during the sample period. Results, shown in Table 8, are similar to those reported for the full sample in Table 4. Notably, reporting aggressiveness is positively associated with shareholder returns and CEO compensation. The magnitude of the association is, however, smaller for restating firms than observed for the full Returns Sample; the range for p_2 for

restating firms is 0.0110 to 0.0219 (Table 8) compared to 0.0360 to 0.0586 for the Returns Sample (Table 4). Thus, while restating firms have a lower association between reporting aggressiveness and shareholder payoffs, the association remains significantly positive indicating that even for the most aggressive reporting firms, reporting aggressiveness benefits shareholders and CEOs.

A second explanation derives from differences in returns cumulation periods. Specifically, our results showing reporting aggressiveness is positively associated with raw and abnormal returns are based on long windows, while restatement analyses are typically based on short windows centered on the restatement announcement. We consider the possibility that shareholders of restating firms gain more in returns preceding the restatements than they lose at the restatement disclosures. Stated differently, firms that engage in highly aggressive, non-GAAP reporting behaviors may earn a higher return *and* put themselves at a higher risk of having to restate. The combination, even if it results in a negative return at the time of the negative reporting event, does not imply a poor tradeoff because the magnitude of the pre-restatement price increase could exceed the magnitude of the restatement-related price decline.

To test this explanation, we examine the returns earned by shareholders of restating firms over periods prior to the restatement. Because these tests use information not known at the time of investment, they do not constitute an implementable trading strategy. We view this analysis as providing descriptive information about the returns earned by firms identified *ex post* as having made extreme and unusual aggressive reporting decisions. Our first analysis examines cumulative abnormal returns over researcher-defined intervals prior to, at, and after the restatement announcement. Our second analysis examines cumulative abnormal returns over the reporting periods identified *ex post* has having been misstated, and at the restatement announcement itself.

Researcher-defined returns intervals: We use calendar time portfolio regressions to examine the monthly abnormal returns to equally weighted portfolios of firms disclosing restatements N months in the future. These calendar time tests go back in time and calculate the abnormal returns to a shareholder who invested in the firm N months prior to the restatement. Abnormal returns are calculated relative to the 3-factor model. That is, similar to the returns tests in Table 4, we measure the abnormal return as the

intercept of the 3-factor model estimated for that period. The sample for these tests is the 5,566 firm-year restatements detailed in Table 1, Panel B.

Table 9 shows the average monthly abnormal return (the intercept) calculated for ten estimation intervals: the first four intervals reflect 12-month periods beginning six years prior to the restatement; the fifth interval is the 10-month interval from -12 to -3; the sixth interval is the 5-month period centered on the restatement announcement itself, months -2 to +2; the seventh interval is the 10-month period consisting of months +3 to +12; and the final two periods reflect 12-month intervals beginning one and two years after the restatement. The results show that, on average, shareholders earned significantly positive abnormal monthly returns in years 3, 4, 5 and 6 prior to the restatement, with a cumulative abnormal return over these four years of 24.50%. Shareholders did not earn a significant average monthly return in years 1 or 2 prior to the restatement. The total cumulative abnormal return earned by shareholders with a 6-year holding period is 27.21% as of three months prior to the restatement.

Similar to prior research, we find that the market reaction to the restatement announcement (in month 0) is significantly negative, averaging -2.12% per month over the 5-month interval centered around the announcement (t-statistic =-6.21). This negative reaction reduces the cumulative abnormal return earned to this point, from 27.21% to 14.29%, but the cumulative abnormal return remains positive and significant. If we extend the holding period past the restatement announcement month from 1 to 4 years, we find no reliably nonzero average abnormal monthly returns (i.e., none of the intercepts is significant at conventional levels). The cumulative abnormal return declines from 14.29% to 10.30%. These findings indicate that shareholders who invest early in restating firms, even when holding onto these shares through the restatement, earn significant positive abnormal returns. The data further suggest that, to be no worse off, an investor would have needed to invest at least five years before the restatement in order to have earned sufficient cumulative abnormal returns to cover the loss in returns at the restatement announcement.

Actual restatement period return interval: We also analyze the returns to restatement firms by incorporating information about the restatement period itself. For 5,211 of the 5,566 sample restatement

observations that come from the AuditAnalytics database, we have detailed data on the reporting periods when the firm's financial statements are misstated. We use these data to calculate the average monthly abnormal returns earned over the restatement period. Panel A, Table 10 shows pooled estimation results, and Panel B reports results that also cluster by calendar month. The average restatement period is about 31 months; over this period, the average abnormal monthly return is 1.21% (t-statistic=11.22), implying a cumulative abnormal return for the entire restatement period of about 46% (t-statistic=11.46). The market reaction to the restatement appears to be concentrated in the month of the announcement, where we document a monthly abnormal return of -1.67% (t-statistic=-3.47).[13] Results using the pooled, calendar-month clustering approach are qualitatively similar, but predictably more conservative in significance.

Overall, we believe the findings in Tables 8-10 suggest that even extremely aggressive reporting firms that violate GAAP, and must restate their financial reports, earn significantly positive abnormal returns for investors over long investment horizons preceding the restatements, even after controlling for the market's negative reaction to the restatement.

6. Summary and Conclusions

We propose and estimate a comprehensive empirical model that allows for associations between a latent variable for real aggressiveness (based on instruments representing investment and financing decisions) and a latent variable for reporting aggressiveness (based on instruments representing income-increasing accounting policy choices) and for associations between both latent variables and payoffs to two key stakeholder groups: shareholders and CEOs. We find that real aggressiveness and reporting aggressiveness are positively correlated, consistent with the perspective that they reflect a possibly stable firm-specific predisposition that may reflect overconfidence, other cognitive biases, managerial traits, corporate culture, governance factors or any combination of these. Reasoning from results in prior research, we consider the possibility that aggressive behaviors, in both investment/financing and reporting

[13] Table 10 shows an average length of 1.42 months for the event month interval. The average length exceeds one because some sample firms have more than one restatement event.

contexts, might be neutral or beneficial with regard to outcomes. The reason is that a certain degree of aggression in corporate decision-making helps overcome basic tendencies toward risk aversion, including a propensity to make over-cautious investment decisions and an unwillingness to accept compensation risk.

In our main tests, we find consistent evidence that aggressive reporting behavior is associated with higher shareholder returns and larger CEO compensation. We find the opposite for aggressive real behavior. These findings are robust to a number of sensitivity tests, including adjustments for industry and year effects. The finding that aggressive reporting behavior is associated with higher shareholder returns is at odds with research that shows sharply negative market reactions to announcements of adverse reporting events, such as restatements. To reconcile these results, we show that the positive association between reporting aggressiveness and shareholder returns is the dominant effect. Stated differently, shareholders benefit from reporting aggressiveness, even in extreme and unusual instances of reporting behavior leading to restatements. The returns to reporting aggressiveness that precede the restatements are significantly larger than the negative reactions to the restatements themselves.

Appendix A: Variable Definitions

Reporting Aggressiveness Instruments		
DepMethod	=	Depreciation method (DPACT_FN). Accelerated (straight-line) depreciation is assigned a value of 0 (1), and a combination is assigned a value of 0.5.
InvMethod	=	Inventory valuation method (INVVAL). LIFO (FIFO) is assigned a value of 0 (1), and the average cost method is assigned a value of 0.5.
AvgLife	=	Average depreciable life across all property, plant and equipment (PPE) assets, estimated as gross PPE (PPEGT) over the sum of depreciation expense (DP) and amortization expense (AM, set to zero if missing.)
OperLease	=	Present value of operating lease obligations (MRC1 through MRC5).
Comp_Increase	=	Assumed rate of compensation increase for defined benefit plans (PPRCI).
ExpReturn	=	Expected return on pension plan assets for defined benefit plans (PPROR).
DiscRate	=	Expected return on pension plan assets for defined benefit plans (PBARR).
ReportAgg	=	Latent variable for reporting aggressiveness.
Real Aggressiveness Instruments		
Acquisition	=	Total of all acquisition transaction values from SDC Platinum in a fiscal year, scaled by adjusted total assets.
Debt_Issuance	=	Debt issuance proceeds in the fiscal year (DLTIS) net of debt repayments (DLTR), scaled by adjusted total assets.
Goodwill	=	New investments in goodwill, calculated as the difference between the ending balance of goodwill (GDWL) and beginning balance of goodwill (lagged GDWL) plus goodwill amortization expense (GDWLAM, set to zero if missing), scaled by adjusted total assets.
CapEx	=	Capital expenditures (CAPX), scaled by adjusted total assets.
R&D	=	Research and development expense (XRD, set to zero if missing), scaled by adjusted total assets.
Advertising	=	Advertising expense (XAD, set to zero if missing), scaled by adjusted total assets.
Leverage	=	Total debt (DLC + DLTT), scaled by adjusted total assets.
Stock_Issuance	=	Stock issuance proceeds (SSTK) net of stock repurchases (PRSTKC), scaled by adjusted total assets.
GW_Impairment	=	Impairment charges for goodwill (absolute value of GDWLIA, set to zero if missing), scaled by adjusted total assets. If GDWLIA is missing and goodwill investment is negative, we set to the absolute value of goodwill investment.
RealAgg	=	Latent variable for real aggressiveness.

Payoff variables		
AvgReturn	=	Average monthly return from CRSP over months m-11 to m. For m=0, the average return is computed over the current fiscal year; for m=+15, the average return is computed from four to fifteen months after the end of the current fiscal year.
AbnReturn	=	Three-factor monthly abnormal return (intercepts) from firm-specific regressions of monthly excess returns on the market risk premium, SMB and HML. The estimation period is months (+4,+15) relative to month (0), the current fiscal year end.
Salary	=	CEO salary from ExecuComp (SALARY), scaled by adjusted total assets.
TotalComp	=	Total CEO compensation from ExecuComp (TDC1), scaled by adjusted total assets.
AbnSalary	=	CEO salary from ExecuComp (SALARY), less mean value of CEO salary for all firms in same 2-digit SIC code, scaled by adjusted total assets.
AbnTotalComp	=	Total CEO compensation from ExecuComp (TDC1), less mean value of total CEO compensation for all firms in same 2-digit SIC code, scaled by adjusted total assets.
Restatement	=	Indicator variable for the fiscal years affected by a restatement according to the Audit Analytics or GAO databases, 0 otherwise.
Other Variables		
Adjusted Total Assets	=	Adjusted total assets, equal to total assets (AT) plus accumulated depreciation (DPACT) plus LIFO reserve (LIFR). DPACT and LIFR are set to zero if missing.

Table 1
Sample Construction and Distribution

Panel A: Selection criteria

	# Firm-years	# Distinct Firms
Firm-years on Compustat North America 1992-2011	230,376	26,073
Lagged total assets, total assets < 1	(55,102)	(4,606)
Missing returns data for months (-11,0) or months (+4;+15), relative to fiscal year end	(69,840)	(8,007)
	105,434	13,460
Missing data on depreciation method or inventory valuation method	(49,663)	(6,014)
Returns Sample	55,771	7,446
Compensation data not available on ExecuComp	36,922	5,495
Compensation Sample (perfect subset)	18,849	1,951
Firm years with full set of reporting aggressiveness instruments:		
Returns Sample	11,559	1,723
Compensation Sample	6,716	823

Panel B: Distribution of sample by year

Year	Returns Sample	Restatement Sample	Compensation Sample
1992	2,889	3	715
1993	3,070	6	829
1994	3,294	11	887
1995	3,450	33	945
1996	3,491	76	953
1997	3,488	109	981
1998	3,313	202	963
1999	3,108	291	936
2000	2,937	411	951
2001	2,931	543	988
2002	2,749	604	994
2003	2,671	647	1,018
2004	2,548	659	998
2005	2,494	486	945
2006	2,394	333	954
2007	2,307	254	992
2008	2,287	221	987
2009	2,192	221	974
2010	2,096	237	936
2011	2,062	219	903
Total	55,771	5,566	18,849

Table 2
Variable Descriptive Statistics

	Returns Sample				Compensation Sample			
	# Obs.	Mean	Std. Dev.	Median	# Obs.	Mean	Std. Dev.	Median
Shareholder Payoff Variables								
AvgReturn (-11;0)	55,771	0.0141	0.0534	0.0110	--	--	--	--
AvgReturn (+4,+15)	55,771	0.0135	0.0532	0.0110	--	--	--	--
AbnReturn (-11;0)	55,771	0.0047	0.0643	0.0014	--	--	--	--
AbnReturn (+4;+15)	55,771	0.0040	0.0645	0.0013	--	--	--	--
CEO Payoff Variables								
Salary	--	--	--	--	18,849	0.0741	0.1245	0.0412
TotalComp	--	--	--	--	18,849	0.3096	0.7504	0.1485
AbnSalary	--	--	--	--	18,849	-0.0084	0.1230	-0.0241
AbnTotalComp	--	--	--	--	18,849	-0.0264	0.7326	-0.0950
ReportAgg instruments:								
DepMethod	55,771	0.9128	0.2108	1.0000	18,849	0.9183	0.1985	1.0000
InvMethod	55,771	0.7547	0.3607	1.0000	18,849	0.6689	0.4156	1.0000
Additional instruments:								
AvgLife	11,559	15.8648	6.5528	14.8825	6,716	16.1699	6.0284	15.2232
OperLease	11,559	0.0394	0.0645	0.0189	6,716	0.0366	0.0602	0.0177
Comp_Increase	11,559	4.0394	1.3766	4.0300	6,716	4.2479	1.0006	4.2275
ExpReturn	11,559	7.8735	2.1391	8.5000	6,716	8.4055	1.3140	8.5000
DiscRate	11,559	6.2474	1.7604	6.5000	6,716	6.4629	1.1932	6.4000
RealAgg instruments:								
Acquisition	55,771	0.0291	0.0823	0.0000	18,849	0.0403	0.0909	0.0000
Debt_Issuance	55,771	0.0098	0.0685	0.0000	18,849	0.0090	0.0616	0.0000
Goodwill	55,771	0.0106	0.0348	0.0000	18,849	0.0122	0.0342	0.0000
CapEx	55,771	0.0460	0.0447	0.0326	18,849	0.0457	0.0387	0.0350
R&D	55,771	0.0371	0.0692	0.0032	18,849	0.0272	0.0487	0.0044
Advertising	55,771	0.0107	0.0281	0.0000	18,849	0.0120	0.0280	0.0000
Leverage	55,771	0.1745	0.1621	0.1454	18,849	0.1724	0.1425	0.1567
Stock_Issuance	55,771	0.0191	0.0963	0.0000	18,849	-0.0020	0.0615	0.0000
GW_Impairment	55,771	0.0057	0.0305	0.0000	18,849	0.0057	0.0316	0.0000
Other Variables								
Adjusted Total Assets	55,771	4,597	24,016	297	18,849	7,311	29,595	1,348

Variable definitions are in Appendix A. The Returns Sample and Compensation Sample are described in Table 1.

Table 3
Latent Variable Analysis

Panel A: Outcome variable, Shareholder Payoff

	AvgReturn				*AbnReturn*			
	Months (-11,0)		Months (+4,+15)		Months (-11,0)		Months (+4,+15)	
Instrument	Coef. Est.	t-stat.	Coef. Est.	t-stat.	Coef. Est.	t-stat.	Coef. Est.	t-stat.
Acquisition	0.5104	91.73	0.5133	92.53	0.5172	92.47	0.5173	92.65
Debt_Issuance	0.4836	88.16	0.4753	87.35	0.4711	86.42	0.4692	86.27
Goodwill	0.5677	98.37	0.5784	99.97	0.5799	99.32	0.5830	99.83
GW_Impairment	-0.0441	-7.73	-0.0538	-9.48	-0.0470	-8.26	-0.0482	-8.49
CapEx	0.0483	8.48	0.0439	7.72	0.0395	6.94	0.0392	6.89
R&D	-0.0615	-10.80	-0.0603	-10.62	-0.0568	-9.99	-0.0573	-10.10
Advertising	-0.0316	-5.54	-0.0319	-5.60	-0.0324	-5.70	-0.0331	-5.83
Leverage	0.2678	48.33	0.2576	46.57	0.2566	46.33	0.2539	45.88
Stock_Issuance	-0.0483	-8.47	-0.0366	-6.44	-0.0422	-7.43	-0.0383	-6.75
DepMethod	0.2695	6.79	0.3384	7.65	0.2823	8.01	0.2864	8.92
InvMethod	0.4022	6.81	0.3203	7.65	0.3840	8.03	0.3785	8.95

Panel B: Outcome variable, CEO Payoff

	Salary		*TotalComp*		*AbnSalary*		*AbnTotalComp*	
Instrument	Coef. Est.	t-stat.	Coef. Est.	t-stat.	Coef. Est.	t-stat.	Coef. Est.	t-stat.
Acquisition	0.5841	66.63	0.5887	66.24	0.5890	67.10	0.5885	66.29
Debt_Issuance	0.4610	55.07	0.4551	54.31	0.4594	54.95	0.4552	54.33
Goodwill	0.6635	72.21	0.6681	71.42	0.6612	72.18	0.6680	71.50
GW_Impairment	-0.0429	-4.65	-0.0433	-4.69	-0.0415	-4.49	-0.0431	-4.67
CapEx	-0.0648	-7.03	-0.0671	-7.29	-0.0658	-7.14	-0.0678	-7.36
R&D	0.0291	3.15	0.0494	5.36	0.0362	3.92	0.0479	5.20
Advertising	-0.0397	-4.30	-0.0383	-4.16	-0.0384	-4.16	-0.0381	-4.13
Leverage	0.2011	22.29	0.1853	20.48	0.1967	21.78	0.1861	20.58
Stock_Issuance	-0.0533	-5.78	-0.0412	-4.47	-0.0536	-5.81	-0.0428	-4.65
DepMethod	0.2371	18.18	0.2517	17.13	0.2235	12.59	0.2570	12.69
InvMethod	0.5064	20.86	0.4771	18.86	0.5372	13.55	0.4671	13.29

Variable definitions are in Appendix A. This table reports the coefficient estimates (t-statistics) for each instrument obtained from estimating the SEM given by equations (1)-(3) for each of the noted *Payoff* variables. Panel A reports results for shareholder payoffs, which use the Returns Sample. Panel B shows results for CEO payoffs, which use the Compensation Sample.

Table 4
Results of Estimating Joint Latent Variable Structural Equations Models for Payoffs

Panel A: SEM estimation results

Shareholder Payoff Variable	path(Payoff, *RealAgg*) (p_1)	path(Payoff, *ReportAgg*) (p_2)	corr(*RealAgg* ,*ReportAgg*) (ρ)	Difference (p_2-p_1)
AvgReturn (-11;0)	-0.0516	0.0407	0.0640	0.0923
	-8.95	*4.25*	*4.92*	*7.81*
AvgReturn (+4;+15)	-0.0957	0.0360	0.0780	0.1317
	-16.66	*3.73*	*6.03*	*10.99*
AbnReturn (-11;0)	-0.0291	0.0471	0.0736	0.0762
	-5.04	*4.91*	*5.69*	*6.39*
AbnReturn (+4;+15)	-0.0613	0.0586	0.0754	0.1199
	-10.61	*6.06*	*5.85*	*9.97*
CEO Payoff Variable				
Salary	-0.1365	0.3764	0.1342	0.5129
	-12.28	*19.43*	*7.52*	*19.39*
TotalComp	-0.0503	0.3125	0.1508	0.3628
	-4.58	*16.93*	*8.09*	*14.34*
AbnSalary	-0.1286	0.2234	0.1300	0.3520
	-12.49	*11.99*	*7.19*	*14.21*
AbnTotalComp	-0.0554	0.1843	0.1525	0.2397
	-5.39	*10.73*	*7.84*	*10.36*

Panel B: SEM estimation using industry-year-adjusted instruments

Shareholder Payoff Variable	path(Payoff, *RealAgg*) (p_1)	path(Payoff, *ReportAgg*) (p_2)	corr(*RealAgg* ,*ReportAgg*) (ρ)	Difference (p_2-p_1)
AvgReturn (-11;0)	-0.0394	0.0329	0.0727	0.0723
	-6.83	*3.30*	*4.99*	*5.87*
AvgReturn (+4;+15)	-0.0814	0.0355	0.0762	0.1302
	-14.20	*3.66*	*5.38*	*10.31*
AbnReturn (-11;0)	-0.0252	0.0283	0.0753	0.0535
	-4.38	*2.84*	*5.19*	*4.36*
AbnReturn (+4;+15)	-0.0598	0.0293	0.0737	0.0891
	-10.39	*2.96*	*5.04*	*7.28*
CEO Payoff Variable				
Salary	-0.1298	0.1719	0.0192	0.3017
	-13.71	*8.95*	*1.13*	*13.61*
TotalComp	-0.0514	0.1815	0.0331	0.2330
	-5.30	*10.42*	*1.71*	*11.20*
AbnSalary	-0.1274	0.2213	0.0177	0.3487
	-13.33	*11.29*	*1.06*	*15.43*
AbnTotalComp	-0.0417	0.1914	0.0302	0.2331
	-4.31	*10.62*	*1.63*	*10.94*

Variable definitions are in Appendix A. This table reports the correlations (t-statistics) between *ReportAgg* and *RealAgg* (ρ) and the path coefficients (t-statistics) between *RealAgg* and *Payoff* (p_1) and between *ReportAgg* and *Payoff* (p_2). We also report tests of the difference, p_2- p_1. The estimates are based on maximum likelihood estimation, with Newton-Raphson iteration, of the SEM given by equations (1)-(3). *RealAgg* is the latent variable capturing real aggressiveness and *ReportAgg* is the latent variable capturing reporting aggressiveness; see Table 3 for the instruments for these variables. Panel A reports results based on unadjusted-instruments, and Panel B shows results using industry-year-adjusted instruments. Results for shareholder payoff variables use the Returns Sample; results for CEO payoff variables use the Compensation Sample.

Table 5
Results of Estimating Single Latent Variable Structural Equations Models for Payoffs

Panel A: SEM estimation results

	Single Latent Variable Estimation		Joint Latent Variable Estimation (Table 4)	
	path(Payoff, *RealAgg)*	path(Payoff, *ReportAgg)*	path(Payoff, *RealAgg)*	path(Payoff, *ReportAgg)*
Shareholder Payoff Variable	(p_1)	(p_2)	(p_1)	(p_2)
AvgReturn (-11;0)	-0.0730	0.0360	-0.0516	0.0407
	-7.19	*2.88*	*-8.95*	*4.25*
AvgReturn (+4;+15)	-0.0946	0.0231	-0.0957	0.0360
	-16.63	*1.68*	*-16.66*	*3.73*
AbnReturn (-11;0)	-0.0293	0.0265	-0.0291	0.0471
	-5.12	*1.48*	*-5.04*	*4.91*
AbnReturn (+4;+15)	-0.0583	0.0434	-0.0613	0.0586
	-10.22	*3.48*	*-10.61*	*6.06*
CEO Payoff Variable				
Salary	-0.0914	0.3511	-0.1365	0.3764
	-9.91	*18.57*	*-12.28*	*19.43*
TotalComp	-0.0067	0.3005	-0.0503	0.3125
	-0.72	*16.55*	*-4.58*	*16.93*
AbnSalary	-0.1035	0.1911	-0.1286	0.2234
	-11.24	*9.64*	*-12.49*	*11.99*
AbnTotalComp	-0.0299	0.1692	-0.0554	0.1843
	-3.23	*9.52*	*-5.39*	*10.73*

Panel B: SEM estimation using industry-year-adjusted instruments

	Single Latent Variable Estimation		Joint Latent Variable Estimation (Table 4)	
	path(Payoff, *RealAgg)*	path(Payoff, *ReportAgg)*	path(Payoff, *RealAgg)*	path(Payoff, *ReportAgg)*
Shareholder Payoff Variable	(p_1)	(p_2)	(p_1)	(p_2)
AvgReturn (-11;0)	-0.0373	0.0190	-0.0394	0.0329
	-6.56	*1.05*	*-6.83*	*3.30*
AvgReturn (+4;+15)	-0.0847	0.0343	-0.0814	0.0355
	-14.95	*3.03*	*-14.20*	*3.66*
AbnReturn (-11;0)	-0.0233	0.0208	-0.0252	0.0283
	-4.10	*1.48*	*-4.38*	*2.84*
AbnReturn (+4;+15)	-0.0577	0.0145	-0.0598	0.0293
	-10.18	*0.74*	*-10.39*	*2.96*
CEO Payoff Variable				
Salary	-0.1273	0.1654	-0.1298	0.1719
	-13.74	*8.44*	*-13.71*	*8.95*
TotalComp	-0.0459	0.1782	-0.0514	0.1815
	-4.93	*10.17*	*-5.30*	*10.42*
AbnSalary	-0.1245	0.2155	-0.1274	0.2213
	-13.43	*10.85*	*-13.33*	*11.29*
AbnTotalComp	-0.0364	0.1881	-0.0417	0.1914
	-3.92	*10.36*	*-4.31*	*10.62*

Variable definitions are in Appendix A. This table compares the path coefficients between each latent variable and payoffs (p_2 and p_1) obtained when only one is included in estimating SEM (left side columns) versus when both are included in the SEM (right most columns, reproduced from Table 4). Panel A reports results based on unadjusted-instruments, and Panel B shows results using industry-year-adjusted instruments. Results for shareholder payoff variables use the Returns Sample; results for CEO payoff variables use the Compensation Sample.

Table 6
Reporting Aggressiveness Proxies and Restatement Frequencies

Panel A: Depreciation method choice (*DepMethod*)

DepMethod	Restatements	Frequency
Accelerated (0)	31	0.56%
Combination (0.5)	639	11.48%
Straight-line (1)	4,896	87.96%
Total	5,566	100.00%

Panel B: Inventory method choice (Inv*Method*)

InvMethod	Restatements	Frequency
LIFO (0)	606	10.89%
Combination (0.5)	1,374	24.69%
FIFO (1)	3,586	64.43%
Total	5,566	100.00%

Panel C: Quintiles based on sum of accounting methods score (*AGG_SCORE*)

AGG_SCORE	Restatements	Frequency
0	6	0.11%
0.25	100	1.80%
0.5	771	13.85%
0.75	1,421	25.53%
1	3,268	58.71%
Total	5,566	100.00%

Panel D: Quintiles based on latent variable for reporting aggressiveness (*ReportAgg*)

ReportAgg	Restatements	Frequency
Lowest	921	16.55%
2	1,166	20.95%
3	1,136	20.41%
4	1,108	19.91%
Highest	1,235	22.19%
Total	5,566	100.00%

Variable definitions are in Appendix A. This table shows the frequency of restatement observations within categories of each reporting aggressiveness measure. The Restatement Sample consists of firm-year restatement observations identified by GAO or AuditAnalytics, and contains 5,566 restatement observations over 1992-2011 (see Table 1, Panel B)

Table 7
Results of Estimating Event Structural Equations Models for Adverse Reporting Events

Panel B: SEM estimation

Adverse Reporting Event:	path(Payoff, *RealAgg*) (p_1)	path(Payoff, *ReportAgg*) (p_2)	corr(*RealAgg*,*ReportAgg*) (ρ)	Difference (p_2-p_1)
Restatement likelihood	0.0162	0.0719	0.0664	0.0557
	2.79	*6.95*	*5.42*	*4.36*

Panel B: SEM estimation using industry-year-adjusted instruments

Adverse Reporting Event:	path(Payoff, *RealAgg*) (p_1)	path(Payoff, *ReportAgg*) (p_2)	corr(*RealAgg*,*ReportAgg*) (ρ)	Difference (p_2-p_1)
Restatement likelihood	0.0031	0.0947	0.0717	0.0916
	0.52	*8.86*	*5.25*	*7.04*

Variable definitions are in Appendix A. This table reports the correlations (t-statistics) between *ReportAgg* and *RealAgg* (ρ) and the path coefficients (t-statistics) between *RealAgg* and *Payoff* (p_1) and between *ReportAgg* and *Payoff* (p_2). We also report tests of the difference, p_2- p_1. The estimates are based on maximum likelihood estimation, with Newton-Raphson iteration, of the SEM given by equations (1)-(3), replacing *Restatement* for *Payoff*. Restatement =1 for firm-years with restatement announcements, 0 otherwise. *RealAgg* is the latent variable capturing real aggressiveness and *ReportAgg* is the latent variable capturing reporting aggressiveness. Panel A reports results based on unadjusted-instruments, and Panel B shows results using industry-year-adjusted instruments. Results use the Returns Sample.

Table 8
Results of Estimating Joint Latent Variable Structural Equations Models on Restatement Firms

Shareholder Payoff Variable	path(Payoff, *RealAgg)* (p_1)	path(Payoff, *ReportAgg)* (p_2)	corr(*RealAgg* ,*ReportAgg*) (ρ)	Difference (p_2-p_1)
AvgReturn (-11;0)	-0.0375	0.0124	0.0228	-0.0499
	-3.15	*3.47*	*4.62*	*-3.96*
AvgReturn (+4;+15)	-0.1073	0.0110	0.0203	-0.1183
	-9.06	*3.46*	*4.62*	*-9.50*
AbnReturn (-11;0)	-0.0259	0.0127	0.0205	0.0386
	-2.17	*3.96*	*4.67*	*3.10*
AbnReturn (+4;+15)	-0.0653	0.0219	0.0276	0.0872
	-5.50	*4.89*	*4.69*	*6.75*

Variable definitions are in Appendix A. This table reports the correlations (t-statistics) between *ReportAgg* and *RealAgg* (ρ) and the path coefficients (t-statistics) between *RealAgg* and *Payoff* (p_1) and between *ReportAgg* and *Payoff* (p_2). We also report tests of the difference, p_2- p_1. The estimates are based on maximum likelihood estimation, with Newton-Raphson iteration, of the SEM given by equations (1)-(3). *RealAgg* is the latent variable capturing real aggressiveness and *ReportAgg* is the latent variable capturing reporting aggressiveness. Results are based on 5,566 firm-year observations in the Restatement Sample over 1992-2011 (see Table 1, Panel B).

Table 9
Calendar Time Portfolio Analysis for Restatement Firms

Month interval	# Calendar Month	Cumulative Abnormal Return	Intercept	Market risk premium	SMB	HML	Adj. R2
-72 to -61	166	4.84%	0.0039	0.9973	0.6659	0.1440	79.77
			1.91	*18.10*	*11.45*	*2.00*	
-60 to -49	176	12.16%	0.0056	1.0817	0.6602	0.2917	81.76
			3.05	*21.33*	*12.43*	*4.37*	
-48 to -37	176	19.21%	0.0051	1.0361	0.6745	0.2384	78.36
			2.54	*18.58*	*11.52*	*3.22*	
-36 to -25	176	24.50%	0.0036	1.1542	0.7606	0.3690	85.12
			1.98	*25.07*	*14.21*	*5.63*	
-24 to -13	177	28.69%	0.0028	1.1564	0.7114	0.2566	84.17
			1.33	*25.04*	*12.09*	*4.09*	
-12 to -3	176	27.21%	-0.0012	1.1230	0.9283	0.1272	82.38
			-0.47	*21.13*	*13.41*	*1.74*	
-2 to +2	171	14.29%	-0.0212	1.1167	0.9074	0.2042	71.59
			-6.21	*15.62*	*9.59*	*2.06*	
+4 to +12	176	9.60%	-0.0042	1.1201	0.8513	0.0860	70.03
			-1.19	*15.15*	*8.48*	*0.83*	
+13 to +24	178	6.82%	-0.0021	1.1002	0.8697	0.0853	70.38
			-0.63	*15.07*	*8.68*	*0.84*	
+25 to +46	177	10.30%	0.0027	1.1286	1.0471	0.0321	81.09
			0.98	*18.99*	*12.80*	*0.39*	

This table shows the results of estimating calendar time portfolio regressions, for monthly abnormal returns to equally-weighted portfolios of firms disclosing restatements N months in the future. Abnormal returns are calculated using the 3-factor model as the benchmark for expected returns; the intercept from this regression is the average abnormal return. Results are based on 5,566 firm-year observations in the Restatement Sample over 1992-2011 (see Table 1, Panel B).

Table 10
Average Firm-Specific Returns in Restatement Period and Various Announcement Windows

Panel A: Pooled estimation

Interval	Average Monthly Return	Cumulative Return	Combined	Average Length (in months)
Restatement Period	0.0121	0.4594	N/A	31.03
	11.22	*11.46*		
Announcement Windows:				
-3 to +3	0.0015	0.0312	0.4892	9.83
	1.08	*2.46*	*11.16*	
-2 to +2	-0.0012	0.0058	0.4411	7.05
	-0.77	*0.59*	*11.27*	
-1 to +1	-0.0056	-0.0170	0.4181	4.25
	-2.66	*-2.30*	*10.34*	
Event Month only (0)	-0.0129	-0.0167	0.4267	1.42
	-3.27	*-3.47*	*11.17*	

Panel B: Pooled estimation, clustered by calendar month

Interval	Average Monthly Return	Cumulative Return	Combined	Average Length (in months)
Restatement Period	0.0143	0.4594	N/A	31.03
	2.49	*6.32*		
Announcement Windows				
-3 to +3	0.0028	0.0312	0.4892	9.83
	0.50	*1.85*	*5.79*	
-2 to +2	0.0004	0.0058	0.4411	7.05
	0.07	*0.45*	*5.96*	
-1 to +1	-0.0045	-0.0170	0.4181	4.25
	-0.80	*-1.77*	*5.93*	
Event Month only	-0.0124	-0.0167	0.4267	1.42
	-1.95	*-2.66*	*5.87*	

This table shows average monthly returns to restatement firms over the actual periods of restatement. Panel A, Table 10 shows pooled estimation results, and Panel B reports results that also cluster by calendar month. The sample consists of the 5,211 (of the 5,566) Restatement sample observations that come from the AuditAnalytics database, which contains detailed data on the time periods over which the firm's financial statements are misstated.

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