



Munich Personal RePEc Archive

The Psychological Attraction Approach to Accounting and Disclosure Policy

Hirshleifer, David and Teoh, Siew Hong

University of California, Irvine, University of California, Irvine

11 March 2009

Online at <https://mpra.ub.uni-muenchen.de/14046/>

MPRA Paper No. 14046, posted 14 Mar 2009 02:08 UTC

3/11/2009

The Psychological Attraction Approach
to Accounting and Disclosure Policy

David Hirshleifer

Siew Hong Teoh

This paper was written for presentation at the 2008 CAR (*Contemporary Accounting Research*) Conference, Québec City, Québec, Canada, November 7-8, 2008. An earlier version of these ideas was presented at the Workshop in Psychology and Capital Markets at the Merage School of Business, UC Irvine. We thank Lucille Faurel, Charles Shi, CAR Conference Participants for very helpful comments, and especially Mort Pincus for insightful reactions to our early ideas.

The Psychological Attraction Approach to Accounting and Disclosure Policy

Abstract

We offer here the *psychological attraction approach* to accounting and disclosure rules, regulation, and policy as a program for positive accounting research. We suggest that psychological forces have shaped and continue to shape rules and policies in two different ways. (1) Good Rules for Bad Users: rules and policies that provide information in a form that is useful for users who are subject to bias and cognitive processing constraints. (2) Bad Rules: superfluous or even pernicious rules and policies that result from psychological bias on the part of the ‘designers’ (managers, users, auditors, regulators, politicians, or voters). We offer some initial ideas about psychological sources of the use of historical costs, conservatism, aggregation, and a focus on downside outcomes in risk disclosures. We also suggest that psychological forces cause informal shifts in reporting and disclosure regulation and policy, which can exacerbate boom/bust patterns in financial markets.

1. Introduction

Much existing positive research on accounting rules and regulation focuses on the benefits of existing rules to rational users, or else to regulation as a result of the battle between rational competing interest groups. Such research has made important advances. However, psychological forces affect individual and group behavior in many contexts. So we argue that to capture important features of accounting, we must go beyond the assumption of perfect rationality.

We introduce here the *psychological attraction approach* to accounting and disclosure rules, regulation, and policy, and suggest that it offers a program for positive accounting research. The psychological attraction approach holds that heuristics and biases in judgments and decisions have shaped and continue to shape accounting rules and policy. Existing research in behavioral economics and finance has studied the design of policies and regulation to help individuals who are subject to psychological bias make better decisions (see, e.g., Sunstein and Thaler 2003). A further nascent direction explores how psychological bias of political participants causes dysfunctional financial regulation (Hirshleifer 2008; Daniel, Hirshleifer, and Teoh 2003).

We propose that psychology shapes accounting rules and policy in two very different ways.

(1) Good Rules for Bad Users:

Rules and policies that provide information in a form that is helpful for users who are subject to bias and cognitive processing constraints.

(2) Bad Rules:

Superfluous or even pernicious rules and policies¹ that result from psychological bias on the part of the ‘designers’ (managers, users, auditors, officials, or voters).

In (1), good rules for bad users, users are psychologically attracted to bad ways of using public information, such as placing incorrect weights on different signals, or in the extreme, completely neglecting an important signal. This creates an opening for policies designed to guide users toward better judgments and decisions. The demand for such policies could come from users, if, in their better moments, they understand that some forms of reporting and disclosure will entice them into error. Alternatively, it could be experts who design policies helpful to users. In either case, a cause of accounting rules and policy is the attempt to help investors make the most of their capabilities and circumvent their cognitive limitations.

In (2), bad rules, heuristics and biases make some forms of regulation and policy irrationally psychologically appealing—regardless of the benefits to users. Furthermore, to the extent that users form biased perceptions in response to accounting information,

¹ We use the word ‘policy’ here in a comprehensive sense to include rulemaking, regulation, spontaneously developed standards and practices, allowing for the fact that both government and private parties make policy.

other market players may have an incentive to institute accounting rules and policies precisely to incite and exploit misperceptions.

However, it is not just managers, accountants, and regulators who design rules. Users are important indirect designers, because managers who need to raise capital are pressured to report or disclose in forms that are appealing to them. The biases of users therefore have shaped the historical development of accounting and disclosure policy, just as the perceptions and cognitive capacities of insect pollinators have shaped the evolution of scent and coloration of flowering plants. (Accounting rules as flowers is a rare metaphor—savor it.)

Our approach here is to understand rules and regulation as consequences of specific psychological biases or social processes, rather than a generalized lack of sophistication on the part of market players. Experimental accounting research often identifies specific investor biases and proposes policies to address these biases. In much accounting research, however, psychological effects are often only implicitly recognized by referring to ‘unsophisticated’ investors or ‘costs’ of processing public information. Direct consideration of psychological forces is important because it ensures that the assumptions made about investor behavior agree with the scientific evidence about how people actually behave.²

In empirical capital markets research, attributing a proposed market inefficiency to some generalized ‘lack of sophistication’ of investors seems like only a modest step toward explanation. There is a large body of evidence and theory from psychology, economics, and finance about different types of biases or limitations that investors are subject to, such as limited attention, overconfidence, and emotional decision making. As a result, a growing empirical literature in finance tests specific psychological hypotheses, such as the effects on asset prices of reduced attention (e.g., Della Vigna and Pollett forthcoming 2009), distracting effects of competing news (Hirshleifer, Lim, and Teoh forthcoming 2009) and feelings (Hirshleifer and Shumway (2003), Edmans, Garcia, and Norli (2007)) on asset prices.

Similarly, behavioral models of capital market prices in economics, finance, and to some extent in accounting have, in recent years, focused on the effects of specific types of erroneous judgment or decisionmaking processes. Examples include hyperbolic discounting (e.g., Laibson 1997), prospect theory (e.g., Barberis, Huang and Santos 2001), overconfidence (Daniel, Hirshleifer, and Subrahmanyam 1998, Scheinkman and Xiong 2003), and limited attention (Hirshleifer and Teoh 2003). Although some of the pioneering research in behavioral finance exploited the modeling device of noise traders whose behavior is mechanically specified (DeLong et al 1990), in the last decade the

² In the policy arena it is hard to avoid using some kind of assumptions about the cognitive limitations of users. This makes it especially dangerous to leave the assumptions implicit. So for both positive and normative accounting research, integration of the experimental accounting and non-experimental intellectual lineages is long overdue. As accounting capital markets research incorporates specific psychological biases, its insights will become more useful for guiding the design of regulation.

trend has been toward endogenous investor decisions, and basing assumptions about investor behavior on evidence from psychology about how people think and decide.

1.1 Good Rules for Bad Users

Behavioral accounting has identified biases (such as framing effects) or cognitive constraints on information processing, and how these biases affect prices and auditor decisions (e.g., Maines and McDaniel. 2000, Libby, Bloomfield and Nelson 2002). Behavioral accounting has also devoted considerable effort to normative proposals for improving accounting rules and regulation (e.g., Kachelmeier and King 2002 and Hodder, Koonce, and McAnally).

This is part of a theme often sounded by practical observers, that investors are irrational and need to be protected from their own biases, and from exploitation by firms or other professionals. With regard to mere error, behavioral economics and finance scholars have pursued the normative project of designing rules tailored to the capacities of individual investors or other naïve players. Bad behaviors that have been targeted include plunging retirement savings into company stock, and insufficient saving. With regard to exploitation, there is evidence of opportunistic reporting and disclosure behavior by firms to exploit cognitively constrained investors (see, e.g., Teoh, Welch, and Wong 1998ab, Healy and Wahlen 1999), and theoretical analysis of how and why this occurs (e.g., Hirshleifer and Teoh 2003).

Our purposes here are different. Rather than normative analysis, we examine a positive issue: what explains the structure of existing accounting rules and regulation, and how it came about. An important example is the question: when does accounting policy and regulation provide good rather than bad rules for bad users? As pointed out by Waymire and Basu (2008), the normative research program implicitly tends to take for granted that once scholars evaluate alternative policies, the most desirable ones will be adopted. It is well understood that there is a problem of lobbying by special interests. However, there is also a problem that psychological bias can make bad rules seem appealing. Indeed, as discussed further below, the ability of special interest groups to succeed in lobbying efforts is probably a consequence of the limited attention and psychological biases of political participants.

1.2 Bad Rules

The main thrust of existing behavioral finance is that psychological constraints and biases affect trading and prices in capital markets. (see, e.g., the review of Hirshleifer 2001). But rule-making is a harder problem than trading, so the potential for bias is even greater.³ Nevertheless, there is relatively little work even tangentially addressing whether psychological bias on the part of designers has shaped accounting regulation.

³ Trading requires forming valuations. But designing a system of rules or regulation affecting parties that are doing valuations requires understanding, among other things, how these parties will do their valuations under alternative systems, and how each system can be manipulated.

There is extensive work on other reasons for ‘bad’ or imperfect accounting rules, such as political pressure group activities (Watts and Zimmerman 1979), including agency problems on the part of politicians and regulators, and political activity by accounting firms (e.g., Thornburg and Roberts 2008). However, the ability of officials to choose bad policies, and for special interest groups to influence policy in detrimental ways, is probably a consequence of the limited attention and psychological biases of voters. Standard approaches to political economy often implicitly assume psychological bias in the sense that voters do not rationally discount for the expenditures of interested parties and the self-serving messages that pressure groups promulgate (see, e.g., Caplan 2001, Hirshleifer 2008.). Even if individuals have little incentive to gather information (‘rational ignorance’), rational voters should make assessments that are correct *on average*. So we should not see systematic patterns of success on the part of interest groups in fooling voters into accepting policies that hurt the great majority of voters, such as farm subsidies.

This suggests a direction for future research, to study how psychological bias enters into political conflict over accounting regulation. This could involve bias on the part of the contending professional groups, politicians, and members of the general public. Ironically, efforts at investor protection can also fall under the Bad Rules category, because policymakers or commentators who seek to protect irrational users, may themselves be irrational in how they go about trying to do this.

A crucial proviso is that we are not trying to portray accounting as a whole as a failure. To the contrary, accounting is a subtle human invention that was crucial for the rise of the modern economy. Systems of record keeping have evolved over millennia to be functional. Important accounting principles evolved spontaneously over centuries, and were later inferred from practice and codified (Waymire and Basu 2008). However, as human constructs, rules and regulation are not perfect. Psychology matters.

We offer here some tentative psychological explanations of types (1) and (2) for facts about historical cost accounting, conservatism, aggregation, a focus on downside outcomes in risk disclosures, and tolerance of earnings smoothing. We do not attempt a systematic evaluation of all possible competing explanations for these accounting characteristics. Our focus is on offering some new possible explanations rooted in psychology. We also suggest that psychological forces cause informal shifts in reporting and disclosure regulation and policy that can exacerbate boom/bust patterns in financial markets.

2. Rules, Regulation, and Psychological Bias

This section offers several ideas about how psychological forces may have shaped accounting rules, regulation, and policy. Most past research has focused on rational hypotheses. We hope that by offering some speculative alternative hypotheses, we can give some hint of an alternative direction for future research.

2.1 Good Rules for Bad Users

Did accounting rules evolve to protect cognitively constrained users? This rationalizing function of accounting can help explain accounting aggregation.⁴ Perhaps the most salient fact about financial reporting is that reports do not give every transaction; transactions are highly aggregated into items. This results in an information loss (Lev 1968), which we would expect providers of capital to dislike. With modern computing power, it may finally be feasible to implement Sorter's (1969) recommendation that financial statements report transactions, but even now, the call for an events' approach has not been renewed. There is a good rational reason for aggregation. Making too much information publicly available can reveal valuable proprietary information to competitors (Black 1993). Nevertheless, some have argued that existing accounting goes too far toward aggregation.⁵

Much less scholarly attention has been devoted to the alternative explanation for aggregation, that users have processing constraints.⁶ A full listing of transactions is meaningless to users with limited cognitive processing capacity. A signal of much lower dimensionality that summarizes information succinctly is much more useful. Aggregated numbers act as prostheses for the missing cognitive ability of investors to distinguish the usefulness of different kinds of signals and to appropriately weigh entries to form summary statistics.

Different reporting and disclosure rules have been designed for audiences with different needs. So if aggregation has the function of helping users, we may expect reporting or disclosure with different forms of aggregation, for different users who are privy to multiple reports. Slicing the information in multiple ways is, to rational and attentive observers, informationally equivalent to greater disaggregation. However, cognitively constrained observers may focus only on those reports and items that are tailored for them.

Some differing ways of slicing categories include tax reporting versus financial reporting, pro forma disclosure versus audited reporting, cash versus accrual accounting, and the inclusion of information in reported items versus footnote disclosures that permit the construction of alternative figures. With respect to cash versus accrual accounting, it is interesting that in recent years there has been growing interest in separating information about business activities from financing activities. The proposed new financial statement format by the FASB and IASB suggests aggregating items in the balance sheet to highlight net operating assets, and aggregating items in the cash flow

⁴ For example, FASB Staff Position FAS 140-4 and FIN 46(R)-8 states that "The entity must strike a balance between obscuring important information as a result of too much aggregation and overburdening financial statements with excessive detail that may not assist financial statement users to understand the entity's financial position."

⁵ In a comment letter to FASB by CFA Institute on FASB FSP 157-d, it was noted that "two published studies of disclosure by Price Waterhouse Coopers and Fitch Ratings show that some reporting entities provide highly summarized and therefore meaningless information." These studies are: Accounting for change: Transparency in the Midst of Turmoil- A Survey of Banks' 2007 Annual Reports, August 2008 - Price Waterhouse Coopers 2) and Fair Value Disclosures: A Reality Check, June 26th 2008-Fitch Ratings.

⁶ Indjejikian and Nanda (1999) and Christensen et al (2002) provide theoretical models that suggest that aggregation substitutes for lack of commitment or enforcement.

statement to emphasize free cash flows, even though these items could previously be constructed from existing statements. Aggregating these items in financial statements has more intuitive appeal for users with limited attention, and can facilitate the forecasting of business activities separately from forecasting of financing activities.

In principle, firms could make available to general users numerous kinds of reports with different forms of aggregation.⁷ In reality, they do not. Again, either proprietary or cognitive constraints could explain this. More information can create information overload, causing some investors to make inferior judgments and decisions. If so, then when too many forms of aggregation are offered, investors will self-standardize by focusing on just a few numbers. Some investors may benefit from guidance as to what to focus on.

If there were no cognitive constraints on information processing, there would be little need for debates over what should be reported versus disclosed in footnotes. If the footnotes allow investors to reconstruct the numbers that would have been reported under a different accounting regime, this informational equivalence would render the accounting regime moot. In reality, many managers and other professionals strongly believe that it makes a difference which of the informationally equivalent means of reporting/disclosure is chosen. For example, the issue of whether to expense employee stock options versus report them in footnotes has generated vigorous debate and heavy political lobbying. In an experimental study, Dietrich et al (2001) find that disclosure of information that is redundant with information in financial statements can improve market efficiency.

Limited investor attention can also result in *conventional disclosure regimes*, wherein investors and firms coordinate to focus on standard items. A key example is standardization on earnings as the key variable to voluntarily disclose or forecast. For a firm or analyst, the choice of earnings is obvious; investors are interested in earnings. Investors with cognitive constraints to have standardization on a single value flow measure that facilitates comparisons over time, across firms. Earnings are highly informative about value creation. However, for many accounting reasons, knowledge of earnings without the separate components is incomplete.

An extreme focus on earnings in disclosure and reporting is imperfectly rational; other signals are informative about value. There is evidence that market fixation on earnings causes market inefficiencies, such as accrual and cash flow anomalies wherein investors neglect the incremental information provided by earnings components (Sloan (1996), Pincus, Rajgopal, and Venkatachalam (2006)). Consistent with these effects representing market inefficiencies (and therefore, cognitive constraints), across countries or firms, institutional factors such as the extent of accrual accounting and limits to arbitrage affect the strength of these effects (Pincus, Rajgopal, and Venkatachalam 2006, and Mashruwala, Rajgopal, and Shevlin 2006). Furthermore, low quality disclosure

⁷ Glover et al. (2005) suggest an alternative system of reporting that separates accounting items into two columns; one values accounting items at historical costs; the other values items based on forecasts. Different forms of aggregation will facilitate use of the financial statements for different users.

exacerbates the accrual anomaly (Drake, Myers, and Myers 2008). Similarly, limited attention and processing power is reflected in the even stronger NOA or ‘balance sheet bloat’ anomaly—in which the return predictor captures cumulative deviations between earnings and free cash flow over time (Hirshleifer, Hou, Teoh, and Zhang (2004)).

Despite the costs of a conventional disclosure regime that focuses on earnings, having a few key focus variables may be optimal for investors with limited processing power. The existence of conventional disclosure regimes, and recent efforts toward assisting investors in processing additional information, suggests several questions for positive research. When investors have cognitive processing constraints, how much detail will be given in voluntary disclosures, in analyst reports, and in news media summaries? What determines which aggregates will be highlighted, i.e., what determines investors’ choice of focus variables? Also, can regulation or policy induce investors to include more variables in their analyses?⁸

Another conventional disclosure regime is the provision of earnings guidance by firms. The provision of earnings guidance is influenced by the spread of ideologies that bear upon its perceived desirability. A widespread viewpoint is that transparency is good, which conditions investors and other observers to press for extensive information disclosure. This rather conventional perspective suggests welcoming earnings guidance, and makes it surprising that a competing ideology would be persuasive. However, there has also been widespread criticism of a focus on quarterly earnings as a sign of ‘short-termism’ on the part of investors and managers. Allegations of short-termism in popular discourse typically sweep together a miscellany of disparate concepts: excessive investor focus on short term corporate profits, managerial efforts to maximize share price, underinvestment by firms, and a failure of firms to innovate. Logically, these accusations are weakly related to each other, and partly inconsistent. For example, since stock prices on average react positively to investment announcements (McConnell and Muscarella 1985), a concern for short term stock prices can cause *over*-investment. However, as argued by Hirshleifer (2008), these accusations are *emotionally* linked, and together form an appealing ideology of anti-short-termism.

The spread of this ideology seems to have had some influence on earnings guidance behavior. In recent years several firms have virtuously announced their abandonment of earnings guidance.⁹ Recent evidence indicates that firms that stop earnings guidance subsequently on average have poor accounting performance. The ideology of anti-short-termism may have provided cover for bad firms to disclose less in the hope of concealing bad news (Chen, Matsumoto, Rajgopal 2008). This example of a misguided but tempting ideology influencing equilibrium disclosure behavior leads naturally to our next topic, bad rules.

2.2 *Bad Rules*

⁸ It also raises the normative question of whether doing so will help investors make better decisions.

⁹ Coke was a conspicuous early example (B. McKay and K. Brown, “Coke to Abandon Forecasts to Focus on Long-term Goals,” *Wall Street Journal*, December 16, 2002).

Bad rules, standards, or policies may come directly from the irrationality of managers or regulators. But bad systems may ultimately, though indirectly, be driven by the irrationality of investors. As mentioned earlier, users are indirect designers of accounting policy, by creating an environment that is tolerant of, or even demands, misleading systems of reporting and disclosure. (By ‘misleading’ we mean misleading to an irrational investor.)

One way in which this can occur is through accounting policies that seem plausible to everyone, and which are adopted based on this plausibility. Alternatively, a policy may be developed as a deliberate effort by managers to mislead irrational investors. If investors don’t recognize that a policy is exploitive, they may accede to a misleading system.

An example is the use for disclosure of pro forma adjustments that only increase earnings, and never decrease them. Investors are free to be skeptical of firms that do *not* give a pro forma disclosure by inferring that such a disclosure would have reduced earnings. But if investors fail to reason this through, their credulity accommodates a biased pro forma disclosure system that has the effect of biasing prices (Hirshleifer and Teoh 2003).¹⁰

Daniel, Hirshleifer, and Teoh (2002) discuss how an array of empirical facts about corporate financing, reporting, and disclosure behavior and of capital market pricing anomalies are consistent with excessive credulity on the part of investors about the strategic motives of managers. They argue that this credulity is a natural consequence of two well-documented psychological effects, limited cognitive processing power, and overconfidence.¹¹ Credulity opens the door to exploitive firm policies, such as managing stock prices upward before new equity issues (e.g., Teoh, Welch, and Wong (1998a,b)), and issuing equity when the firm is overvalued (Loughran and Ritter (1997)).

Both possibilities are accommodated by the psychological attraction approach. However, the possibility of deliberate exploitation has received more attention in the finance and accounting literature. We will therefore place greater emphasis on examples of how imperfect accounting rules or policies could arise without strategic motives.

2.3 Accounting Conservatism and Loss Aversion

Accounting conservatism, a more timely recognition of losses than gains, emerged in the 13th and 14th centuries (Waymire and Basu 2008). It is pervasive across many countries and time periods (Ball, Kothari and Robin 2000). Examples of

¹⁰ The use of pro forma earnings to manipulate investor perceptions takes advantage of limited processing power on the part of investors. A regulatory response designed to protect investor, Regulation G, forces reconciliation of pro forma earnings with GAAP earnings. The argument above suggests that this will not fully correct investor perceptions.

¹¹ Credulity is a natural consequence of a failure to reason through how the strategic structure of a game conditions the incentives of other players. Experiments in behavioral game theory confirm that individuals have limited capacity to draw appropriate inferences even in simplified laboratory settings (Camerer, Ho, and Chong 2004).

conservatism include rules for expense anticipation, revenue deferral, R&D expensing, and asset write-downs but not write-ups

Several possible explanations for conservatism have been offered (see, e.g. Watts 2003). These include improved value-relevance of financial statements, contracts with creditors or other parties who are especially concerned with downside outcomes, the threat of lawsuits, and taxation. With respect to the first explanation, a traditional view is that managers tend to report too aggressively, either because they are genuinely overoptimistic, or for strategic reasons. Conservatism provides a way to rein in these tendencies. Most of these arguments have a degree of empirical support (Watts 2003), but seem incomplete. Psychological bias does not seem to have been considered seriously, if at all, as a possible explanation.¹²

Psychological evidence shows that people react asymmetrically to possible upside versus downside payoff outcomes relative to arbitrary reference points. Since conservatism is about asymmetries between gains and losses, it is surprising that psychological explanations for it have not been considered.

Our explanation, in brief, is that people dislike being disappointed, and they like conservatism because this reduces the likelihood that future disappointments will occur. To tighten this argument, we use several very closely related psychological ingredients. Negativity bias is the tendency to pay more attention to dangers or the prospect of bad outcomes than to possible gains (Baumeister et al. (2001). (Directing attention in this way might seem rational. However, different ways of presenting a decision problem can manipulate the reference points that define whether a possible outcome is perceived as a gain or loss.)

Loss aversion is the tendency to avoid losses measured relative to some salient reference point. For example, it feels quite bad to have value fall even a little short of a forecast. Of course, it also feels good to beat a forecast, but the pain of a small loss seems to substantially exceed the joy of a small gain.

Mental accounting is the tendency for people to classify payoffs into different mental categories. Framing affects how people classify, and the categories are at least to some extent non-fungible, so that arbitrary classifications affect how people feel. People also engage in hedonic optimization, i.e., make choices that manipulate their own mental accounting system in order to feel happier.¹³

Putting these together brings us back to our simple explanation of conservatism. Recognition of profits or assets involves a forecast of the future. Conservatism reduces the likelihood that this forecast will disappoint. Users who find the prospect of being

¹²Watts (2003), in a two-part review of research on conservatism, indicates that “The alternative explanations for conservatism are contracting, shareholder litigation, taxation, and accounting regulation.”

¹³ See Thaler (1985) and Thaler and Johnson (1990). An example is making choices of when to realize a gain and a loss because the utility derived from them is different when they are combined or segregated (Lim (2006)).

disappointed vividly unpleasant should find the principle of conservative reporting attractive. This is regardless of whether they are they are consciously aware of why they find it attractive.

This argument suggests a direction for future research, to perform field or laboratory experimental testing to see if and when people have an irrational preference for conservative reporting.¹⁴ An experimental approach can show whether conservatism develops when we rule out or strictly control rational contracting considerations.

Loss aversion may also help explain earnings management to beat thresholds (DeGeorge, Patel, and Zeckhauser 1999), the torpedo effect (Skinner and Sloan 2002), and the walkdown to beatable analyst forecasts (Richardson, Teoh and Wysocki 2004). Of course, the strategic games played between managers and investors involve some rational manipulations and inferences, but that does not rule out a psychological component to investor's responses. Recent research has shown that regulatory shifts have affected threshold-related earnings management behavior and market responses (Koh, Matsumoto and Rajgopal 2008). Since investors dislike unpleasant surprises, a further direction for experimental research is to examine whether investors actually like, or find appealing, regulatory regimes that give firms enough discretion to surpass thresholds.

Of course, in multiperiod settings, conservatism in one period implies aggressiveness in other periods as catch-up. Overall, conservatism still reduces the probability that the future will disappoint relative to the value forecasts implicit in recognized revenues or assets. However, it is possible that investors form beliefs by extrapolating earnings trends. Conservatism early in the life of a firm can create an upward trend, which could cause optimistic expectations and subsequent disappointment.

However, the idea that being conservative now is safer and protects against later disappointment is immediately intuitive. The original "designers" (users) of evolved accounting system are unlikely to have fully thought through such multiperiod effects. The extrapolation argument is subtle and requires direct attention to think through. It is likely that most users are guided by 'gut' or 'instinctive' notions that unconsciously guide what seems plausible and appealing.

2.3.1 Limits to Existing Theories of Conservatism

Some of the existing theories of conservatism seem to capture important aspects of the puzzle, but may not be complete. With respect to the idea that the purpose of conservatism is to rein in natural or strategic managerial optimism, there is no immediate presumption that conservatism will increase the informativeness of financial statements for value. For example, one recent empirical study (Bandyopadhyay et al 2008) concludes that "the adoption of an increasing number of conservative accounting standards possibly has a deleterious effect on earnings usefulness..."

¹⁴ In psychology, the term 'conservatism' has an unrelated meaning, sticking to one's preexisting beliefs in the face of new information. This is quite different from accounting conservatism, the more timely recognition of losses than gains.

In a simple enough setting, rational investors can undo any effect of managerial aggressiveness on average value. We can think of conservatism as introducing bias in an accounting item as a signal of value. But in general, regardless of bias in a signal, a rational observer will have correct expectations on average. So there is no presumption that aggressiveness will make rational investors overoptimistic.

It is true that aggressiveness that is stochastic or a function of private signals can create noise and make reports less informative. This provides an argument for reducing managerial discretion. But conservatism is not specifically about reducing discretion, it is about biasing the mean downward. The two may be connected indirectly, but at a minimum a subtler argument is needed. Holthausen and Watts (2001, pp. 31-32) make a related argument, that “This conservatism in financial reporting cannot arise solely from the reliability characteristic, as there is nothing asymmetric in the nature of reliability by itself...”.

With respect to optimal contracting theories, Christensen and Demski (2004) derive conservative managerial choices as a result of optimal monitoring in a contracting setting, and Watts (1993) proposes that conservatism helps keep debt covenants binding, preventing firms from paying out firm resources as dividends. However, conservatism-inducing rules could in principle be made contingent on firm leverage. That would seem to make sense if conservatism is good for creditors but useless for equityholders. In contrast with earlier contracting theory of conservatism, in the model of Gigler et al. (2009), conservatism, through its effect on the informativeness of financial reports, can decrease the efficiency of debt contracting. For example, conservatism can cause ‘false alarms’ wherein covenants are triggered even when the underlying economic conditions are good, causing inefficient transfers of control rights.

Furthermore, stockholders have need for upside as well as downside analysis, and it is not obvious that the reporting system should mainly serve needs of creditors (though historically the demand for accounting information may have originated with creditors). Consistent with the contracting theory, there is evidence that creditors like asymmetric timeliness more than equityholders do (Peek, Cuijpers, and Bujink 2008). However, an open question for the contracting theory is that in principle different reports could be issued for creditor versus equity audiences. The fact that the form of reporting would continue to cater to the needs of debt over equity even in the age of widely held firms and even for firms with essentially zero levels of debt still requires explanation.

Litigation pressure seemingly offers a very direct explanation for conservatism, that firms are often sued when their stock prices drop, but not when they jump. To avoid lawsuits, the firm reports conservatively ex ante. Auditors also like conservatism because they are less likely to be successfully sued. However, this approach does not explain conservatism in periods and countries with less litigation risk (Holthausen and Watts 2001).

Furthermore, this explanation does not explain *why* there is an asymmetric tendency for lawsuits to be successfully undertaken more after stock price declines than after increases. After declines, recent buyers sue and receive large settlements. But by symmetrical reasoning, after increases, why don't recent sellers sue and gain large settlements? A possible answer is that the courts are subject to an asymmetric bias, wherein the losses of buyers receive heavier weight than the losses of sellers. If so, it is this psychological bias that is feeding into the accounting system.

What might be the source of such an asymmetric bias? There is a great deal of evidence from the finance literature that investor trading is influenced by reference points, and that the purchase price of a stock is a key reference point. When a buyer pays too much for the stock, the purchase price is the reference price, and the buyer loses relative to that price. But when a seller receives too little for the stock, he does not have any loss measured relative to his sale price as a reference point. And quite likely he has a large gain relative to his original purchase price years earlier. To identify the seller's loss, we need to use as reference point a later, higher stock price. But such a later stock price is not simultaneous with the relevant transaction by the seller, and is set at some arbitrary later point in time when the seller is no longer even a shareholder. In other words, unlike the case with buyers, the most natural possible reference points to choose for sellers do not make their losses salient.

Finally, we turn to taxation as a source of conservatism. The fact that there is only very limited requirements in the U.S. to coordinate tax reporting and financial reporting for investors (the LIFO conformity rule) opposes this explanation.

The possibility of irrational explanations for conservatism seems to have been neglected. Holthausen and Watts (2001 pp. 35-6) point out that the early criticisms of write-ups on tangible assets were based on mistaken beliefs, but that these criticisms nevertheless caused the SEC to eliminate this practice. This raises the question of why, in the absence of supporting evidence, it is so tempting for observers to be skeptical about the practice write-ups, but not equally skeptical of the practice of write-downs.¹⁵

2.4 The Preference for Smooth Performance and Accrual Accounting

Hedonic optimization may also help explain investor preference for smooth performance. Investors who engage in hedonic optimization may like to smooth away volatility to reduce the probability of 'losses' (relative to the benchmark of zero earnings, last year's earnings, or analyst forecasts of earnings). Risk averse or loss averse investors may prefer to hide from danger like ostriches (mythically) putting their heads in the sand.

¹⁵ Holthausen and Watts discuss how some of the founding commissioners of the SEC believed that write-ups contributed to financial problems during the Great Depression. When the SEC was created, it essentially eliminated write-ups on fixed assets. Holthausen and Watts point out that "Many accountants writing after the stock market crash stated or implied (without formal evidence) that assets written up in the 1920s were written down again in the 1930s," where the written-up assets were primarily fixed assets. Subsequent research did not confirm this belief, in that it was primarily intangible assets that were written down (p. 35, footnote 5).

It is rational for investors to prefer smooth performance if roughness is an indicator of risk. However, it would be a mistake for investors to value a firm more just because it smooths earnings in visible ways. The tendency of firms to use accounting discretion to smooth measured performance suggests that managers believe that investors like smoothness. Indeed, using survey evidence, Graham, Harvey, and Rajgopal (2005) find that CFOs are strongly focused on smoothing earnings, and admit to be willing to forego positive NPV projects to do so. Furthermore, there is evidence that investors prefer smooth performance, in the sense that firms with higher cash flow volatility receive lower valuations (Rountree, Weston, and Allayannis 2008).

Investors may value artificially smoothed performance simply because they are not paying attention to accruals, so that they do not see the difference between fundamental versus artificial smoothness. Even less rationally, investors may consciously prefer a firm that smooths earnings because smooth performance of investors' focus variable is appealing.

This may come about from a misplaced desire for predictability. In general people have a preference for gambles within domains in which they feel they are knowledgeable and competent, even holding constant the probability distribution of payoffs (Heath and Tversky 1991). Investors may feel more competent to forecast the future for firms that have smoother earnings. Being able to forecast the future feels good, because in general it allows us to prepare for contingencies and control our environment. An interesting further research question is whether an irrational user preference for smoothing, or at least an excessive tolerance of it, cause users to tolerate rules for accrual accounting that accommodate extensive discretion.

2.5 Historical Cost Accounting and Mental Accounting

Thaler (1985) borrowed the term 'accounting' to describe a psychological phenomenon, mental accounting. In historical cost accounting¹⁶ (also aptly called historical transactions accounting; Ijiri 1975), recognition comes with completed (or virtually completed) transactions. This is the revenue recognition principle. As a result, gains and losses are readily perceived relative to original purchase price as a reference point.

Under mental accounting, investors pay less attention to intermediate gains or losses, or view them as not completely real, until position is closed (or some other special trigger of reevaluation occurs). In other words, there is limited mental marking-to-market of unrealized gains/losses. The measurement of gains or losses relative to an historical purchase price feels profoundly correct, as reflected in the saying, 'Buy low, sell dear.' But as prospect theory and empirical behavioral finance show, making reference dependent decisions leads to investment errors. Making current decisions based on accidents of history that are irrelevant for future payoffs is irrational.

¹⁶ A justification offered by Ijiri (1975) is that the role of accounting is to ensure accountability, not to provide information for general decisions.

Is the strong parallel between historical cost accounting and psychology of investors by chance? Or did human psychological propensities feed into evolution of the accounting system?

There are of good reasons for the use of historical cost accounting in some contexts. For example, when markets are illiquid, the requirement to assign market values to infrequently traded assets may give managers undue discretion about what to report. However, marking to market seems to have a legitimate realm of applicability. This raises the question of why, historically, it was slow to catch on.

A psychological explanation is that the idea that a ‘paper’ gain or loss is economically just as meaningful as a realized gain is unintuitive. The term “*realized*” exemplifies how ingrained mental accounting is in the way people think. Even sophisticated individuals probably think this way in weaker or less attentive moments

The psychological distinction between realized and unrealized gains is a special case of the phenomenon that investors view different mental accounts as qualitatively incommensurate even when the accounts have only historical meaning, or when value is easily transferable between accounts. Another example is the tendency for people to view it as different to spend out of interest versus out of principal. Of course, people are not utterly incapable of integrating separate mental accounts. However, doing so takes additional cognitive steps, and may not feel right unless ‘justified’ by relevant framing or transactions

Mental accounting is not, however, the only possible psychological explanation for a distaste for marking to market. An alternative explanation is the action/omission distinction identified by Ritov and Baron (1990). People often indicate they would choose not to vaccinate when the vaccine can cause death, even if on average it greatly reduces likelihood of death. In other words, there is a greater distaste for the bad consequences of commissions than of omissions. Economics students need to be trained to use the concept of opportunity cost, which is incurred by an omission (refraining from exploiting the opportunity).

Marking to market is a commission, the active updating of the valuation of an asset. Sticking with the historical cost is passive. Either approach can go wrong *ex post*. Omission bias implies that marking to market will be less appealing.

2.6 Risk Disclosure

To provide value-relevant information to investors, why don’t financial statements report range of values, or means and variances, instead of an all or nothing decision of whether to recognize? Such proposals were discussed in the 1960s and 1970s (Oliver 1972), but went out with bellbottoms. One of the problems with such proposals is complexity. For users with limited attention, having more information can reduce effective use of information.

Nevertheless, risk disclosure is required for derivatives securities (for example FASB 119). The singling out of derivatives for risk disclosure regulation may be motivated by the idea that the risks of derivatives can be quantified more precisely than those of other assets; on the other hand, it may reflect the popular notion that derivatives are uniquely risky. This notion may be mistaken. For example, a long position in a gold futures contract is not necessarily much riskier than holding physical gold, since their prices are linked by an arbitrage relation. Furthermore, derivatives are often used to hedge, so derivatives positions often contribute negatively to portfolio risk. So an interesting research question is what psychological forces contribute to public perceptions that derivatives are uniquely risky, and how these forces shape derivatives accounting and disclosure regulation.

These rules permit asymmetric disclosure of downside risk, in keeping with how people think about risk in general. Analysis of risk in practice often takes form of studying worst-case scenarios, rather than risk measures such as variance that reflect the full probability distribution of outcomes. Risk perceptions focus upon the potential for loss in the general population (Yates and Stone 1992, Loewenstein et al 2001), and among analysts and investors (Olsen 1997, Koonce, McAnally, and Mercer 2005).

The use of Value-at-Risk (VaR) by firms indicates that managers find worst-case thinking intuitive. VaR is the evaluation of risk in terms of probability of a loss greater than some arbitrary amount. However, expected utility theory teaches that there is nothing special about gains or losses, or about losses that exceed some arbitrary cutoff. Limited investor attention, however, encourages conceptual simplification by discretizing into binary categories such as ‘gain’ versus ‘loss’, or more to the point here, ‘normal’ versus ‘disaster’. When stressed or threatened, people tend to think in binary terms. For example, during wartime or economic crisis, people experience emotions of anger and fear, and start viewing others either as heroic allies or vicious enemies. This raises the question of whether it is especially tempting to think in binary terms when contemplating the risks of large losses.

The SEC requires disclosure of quantitative information about the risk of derivative securities, which can take form of VaR (Value at Risk), sensitivity analysis, or in tabular form (SEC Financial Reporting Release No. 48 on derivative and market risk disclosures; Hodder, Koonce, and McAnally (2001) analyze the effects of different forms of derivatives risk disclosure.) Both the sensitivity analysis and VaR methodologies require firm to disclose information about the potential downside but not upside associated with relevant market risks. Koonce, Lipe, and McAnally (2005) find experimentally that loss-only risk disclosures cause investors to assess firms with differing underlying exposures as equally risky.¹⁷

¹⁷ We argue that loss aversion makes symmetric risk disclosure plausible. However, owing to information processing biases, asymmetric disclosure can also induce mistaken expectations; see, e.g., our discussion of pro forma disclosure. Dietrich et al (2001) find experimentally that disclosure of an upper bound of management's estimate of an uncertain quantity can bias security prices upward, whereas this bias is eliminated by informationally equivalent disclosure of both upper and lower bounds.

A possible rational explanation for down-side disclosure is based on strategic incentives of managers. Managers in general are happy to present the upside, so risk disclosure regulation is mainly needed to ensure information about the downside. However, perhaps owing to risk of litigation, in reality managers of U.S. firms do not voluntarily provide clear and specific forecasts about the middle and upside of the probability distribution of firm performance (whether derived from derivatives or not).

An alternative rational explanation is that downside-focused reporting serves the needs of creditors, who are primarily concerned with downside risk. This suggests that rules for risk disclosure should depend on leverage. For example, some firms are almost debt free. Furthermore, even leveraged firms have shareholders who should be concerned with upside risk. Nor have rules for derivatives disclosure been presented as being mainly for the benefit of creditors.

VaR and other downside-only reporting act as amplifiers of the investor bias toward focusing on worst-case scenarios. More generally, we expect regulation often to reinforce and amplify investor biases, since regulations that reflect popular assumptions about investing will implicitly be viewed as validating them.

2.7 Accounting For Different Audiences

A way to test the psychological attraction approach is to consider the comparative statics that shift psychological effects. This should cause accounting and disclosure rules/policies to differ when they are designed for different audiences or settings. For example, psychologists have documented that cultural differences beliefs about the reversal of good fortune; clearly this and other cultural differences can affect the attractiveness to investors of conservative reporting and other rules and policies. The changing set of players and environments over the historical development of rule-making should provide a rich set of possible hypotheses; to take one example which we will discuss further, the psychological appeal of restrictive regulations should differ in boom versus bust periods. The audiences for financial reports are likely to have different needs, and to face different triggers for bias, in publicly versus privately held firms; in government versus private sector accounting; and in tax accounting versus financial reporting.

Government accounting is designed to exploit limited public attention toward budget information. There is free-riding by citizens in attending to and processing government accounting numbers, or to knowing about the accounting methods used by government. Legislators and other political players are therefore free to design public accounting systems to conceal rather than reveal.

Accounting rules for taxation are more cash flow oriented than rules for reporting, because tax authorities are not seeking to understand the business or to invest. The main purpose of tax accounting is to monitor compliance rather than to communicate information about the firm's economic status: reliability takes priority over relevance. This makes it less crucial for reports to reflect economic circumstances in timely way. A

prediction of the psychological attraction approach is that the required form of reporting is less likely to reflect biases such as disliking losses or disappointments, or the desire for smoothness.

Investors, managers, and the public seem to dislike debt. It is rational to be wary of excessive debt, as the credit crisis of 2008 has painfully underscored. Psychological forces may underlie a debt-averse ideology. Thrift and foresightedness are personal virtues; we do not encourage our children to borrow heavily. As Shakespeare's Polonius advised, "Neither a borrower nor a lender be." However, where debt in personal life is usually used to finance consumption, debt in corporate life may be used to invest or to reduce equity financing. Indeed, debt may act as a constraint on corporate profligacy (Jensen 1986). Nevertheless, some popular discussion equates corporate debt with a lack of managerial will power or foresight.

Perhaps in part owing to a failure to analyze deeply the difference between firms and individuals, firms are similarly praised for having a 'clean balance sheet.' Owing to debt aversion of investors, firms strive to conceal debt or take it off balance sheet, e.g., through the use operating leases instead of capital lease or purchase. If investors were rationally skeptical, there would be a stronger pressure for transparency. However, although investors dislike leverage, they also do not seem sufficiently concerned about the matter to press for regulation that prevents concealment of debt.

This illustrates a general paradox of reporting regulation. If investors underweight the importance of an information signal about value, rules or regulation that force disclosure of this signal or that requires highlighting of the signal in financial reporting may improve investor judgments. However, the very fact that investors do not care much about a signal weakens the political pressure toward policies to reveal or highlight it. As a result, reporting rules may allow inappropriate discretion on the part of management, until a major financial disaster and media coverage highlights the issue and makes it salient to the public.

2.8 Informal Policies and Social Processes

Reporting and disclosure regulation goes beyond formally stated rules. During financial crises, market players such as speculators, managers of failing firms, credit ratings agencies, and analysts are vilified. Some deserve to be. Serious financial problems result in congressional hearings, lawsuits, and popular media portrayals of key players as selfish and dishonest.

A consequence of scapegoating is that financial crises will tend to be self-feeding, as auditors, analysts, lenders, underwriters, credit rating agencies and media commentators are pressured into (or believe they can find advantage in) making tougher evaluations of firms. In other words, the informal side of financial regulation become stricter exactly when markets are doing badly. Some firms will overstate their performance to try to stave off a financial run, but others will report more conservatively out of fear of vilification.

As evaluators become tougher, more firms fail, which in turn puts more firms into distress and makes popular observers even more ready to think ill of managers. So the psychological attraction approach implies that there will be evaluation-driven overshooting during financial crises. The obverse of this is a tendency for slackening of informal standards during good times. We call this the boom-bust pattern in informal regulation.

Historically, formal disclosure and reporting regulation tends to come in spasms after major market upheavals. Key examples are the Great Depression, which led to the securities regulations and rules for disclosure of the 1930s, and the collapse of high-tech stocks at the turn of the millennium, which led to Sarbanes Oxley rules on auditing. This suggests that the credit crisis of 2008 may result in new rules as well, perhaps concerning disclosure of derivatives holdings, disclosure of off-balance sheet debt, or rules for marking assets to market.

Since disasters can reveal failures in the existing system, it is no surprise that new regulation follows upheavals. However, the psychological attraction approach suggests that upheavals can also incite irrational pressure for dysfunctional regulation. When things go wrong (e.g., a bubble and crash), the idea that it is just a bad realization, or the result of abstract market and social processes, is not appealing (Hirshleifer 2008).

Finding scapegoats for financial crises is psychologically attractive in several ways. It lets people who are suffering place the blame times on others, which makes it easier to maintain self-esteem. Furthermore, there is a general cognitive tendency to perceive consequences as resulting from specific agents rather than abstract or impersonal processes (Barrett 2000, Boyer 2001). Outcomes are perceived as direct results of controlling individual choices rather than emergent effects of social processes. Crashes are attributed to manipulation by scheming speculators, or deception by firms, not to impersonal market forces. High level managers and financial players are wealthy, and feelings of envy make it easy to believe the worst of them. The social value created by financial players is not self-evident to most people, because understanding it requires a focus on abstractions and indirect effects. This is especially the case for speculators, who tend to be viewed as gamblers or thieves.

After a disaster, it is psychologically attractive to design regulation to punish scapegoats, or to hinder future misbehavior by such parties. We therefore expect scapegoating to shape resulting disclosure and reporting regulation. For example, recently new rules have been proposed requiring disclosure of short but not long positions. This is appealing because it requires little cognitive processing to associate short-selling with bad news. Deeper analysis is required to understand how short-sellers make markets more efficient, and that they are typically the messengers rather than the cause of bad news.

A more general way in which psychology shapes reporting and disclosure regulation is in overestimation of the ability of the political process to achieve an optimal system (see Waymire and Basu 2008, Hirshleifer 2008, and in a more general context,

Hayek 1988). One problem is motivating regulators. The subtler problem is whether benevolent regulators have the ability to institute good systems. An excessive belief in the efficacy of top down design of the economy can be called *intervention bias*. (Hayek refers to it as the ‘fatal conceit.’)

One source of intervention bias is a failure to grasp that trade is mutually beneficial, so that voluntary exchange pushes equilibrium market outcomes toward Pareto optimality. The Coase Theorem implies that coercive intervention by the state will not be helpful unless property rights are ill-defined or there are bargaining problems. This limitation on the conditions under which corrective action is helpful came as a surprise even to economists, who had equated externalities with a need for correction. This limitation on the benefits to corrective action is unintuitive, because in everyday life problems are highly addressable through action.

Of course, in reality there are often problems with property rights or bargaining, as with the exploitation of benefits from innovation. However, more generally, limited improvability of market outcomes is unintuitive because the ordinary expectation is that good designs result from the intentions of agent, not spontaneously; people do not understand the concept of spontaneous order (see discussions in Waymire and Basu 2008, p. 101). An example is William Paley’s argument by design for the existence of God, that the exquisite functioning of organisms implies a designer just as the existence of a watch implies a watchmaker. The alternative theory, adaptation through natural selection, is unintuitive.

It is similarly hard to understand that market outcomes represent the cumulative design efforts of many individuals in markets, making it hard for even a very bright regulator to do better. If the notion of spontaneous order is not a part of an individual’s mental toolbox, then he will attribute good or bad outcomes mainly to good or bad planning and design on the part of regulators.

An analogy illustrates this intervention bias. The human body is a complex functional system. When things go wrong, people are attracted to simple-minded diagnoses and treatments. For example, bleeding and leeches were popular treatment for centuries. Now, it is dietary supplements and homeopathic cures. Similarly, the belief in crackpot treatments for perceived financial ills persists in large part because it is intuitive that we ought to be able to do something to help (Hirshleifer 2008).

The appeal of regulatory intervention is increased by limited attention, overconfidence, and conformist instincts. Owing to limited cognitive processing power, simplistic sound bite prescriptions are salient and memorable, and hence spread readily through conversation and media. An overconfident individual who decides in favor of a simple, catchy, plausible-sounding diagnosis and prescription will tend to lock firmly onto it and feel sure that he knows the truth. Owing to conformist instincts, when sound-bites are repeated many times, they tend to be viewed as truth. As a result, voters tend to act based on simple theories about problems and their solutions.

This discussion suggests that new accounting regulation will often result in unanticipated consequences (Waymire and Basu 2008). Of course, the problem of unintended consequences pervades all aspects of life. However, designing a regulatory improvement is inherently harder than remodeling a kitchen. For the problems of personal life, energetic action normally beats passivity. For regulation, there is no such presumption. In the spontaneous order, functionality is produced by the creativity and trial-and-error activity of many individuals and firms. Market institutions are the result of combined creativity and trial and error in ways that are not always well understood; this makes it hard to improve by direct design.

Whereas the tendency of people to overestimate what regulation can achieve promotes new regulation, omission bias (discussed earlier) creates inertia, which opposes new regulation. Omission bias, however, is a double-edged sword, since it also opposes the removal of regulation. The inertial effect of omission bias is most easily overcome after market disasters. When a new problem arises, people want to see a response—‘don’t just stand there, do something’. This results from the tendency, discussed earlier, to perceive outcomes as simple effect of individual agency, and to seek scapegoats for bad outcomes.

3. Conclusion

We propose here the psychological attraction approach to accounting and disclosure rules, regulation, policy. We argue that the tracks of psychological bias can be found in important stylized facts about accounting and disclosure policy, construed broadly to include both formal rules and informal variations in how they are applied.

This is a positive theory, as contrasted with much of existing work applying behavioral accounting to the design of new regulations. Of course, the two issues are closely related. An understanding of the psychological forces that makes bad rules tempting will tend to cast a clearer light on which rules are good or bad, and will provide a language to explain why some rules are better than others. Furthermore, an understanding of the biases that underlie bad regulation can help scholars themselves avoid falling into error and reinforcing the pressure for bad regulation. Unfortunately, there is also the risk that a better understanding of the psychological forces that influence politics will enable pressure groups to manipulate the system more effectively.

A natural direction for applying the psychological attraction approach is to explain the original history of record-keeping and reporting. This permits a sharper focus on how psychological forces affected the parties involved with private contracts, as distinct from the effects on political participants involved with rule-making organizations. Even under full rationality, record-keeping system is valuable, because verifiability deters contracting parties from renegeing. Limited memory creates a need for recordkeeping (Waymire and Basu 2008). But limited memory, and limited *cognitive processing power* also affect how information should be stored for useful retrieval. So to understand the evolution of record-keeping, we need to understand how information is summarized and framed to be appealing for users.

There are competing explanations for many of the stylized facts about accounting and disclosure rules and regulation that we seek to explain. We do not know how well the specific versions of the psychological attraction approach that we have proposed here will stand up empirically against traditional explanations. Our main point is that psychological hypotheses should not be eliminated from consideration through sheer inattention and neglect.

We have suggested several directions for further theoretical development and testing of the psychological attraction approach, but there are many others. For example, an interesting question is when regulation and accounting rules will reinforce and amplify investor biases, and when it will act as a corrective. This may depend on whether the bias is one that regulators or investors can, at least in their better moments, 'see through' well enough to design corrective policy, as compared with biases that are so pervasive that they shape regulation in their own image. We suggested in Subsection 2.6 that the tendency to collapse the concept of risk to the probability of downside outcomes is so intuitive that even sophisticated players do not notice the fallacy. As a very different example, volatility is often viewed as inherently bad, as reflected in criticisms of speculation as a creator of price volatility even though efficient markets should have price volatility. As mentioned in Subsection 2.4, if investors view earnings volatility as bad, this can make them tolerant of rules and regulation that accommodate heavy earnings smoothing.

These topics bear upon the larger question of when regulation and policy provide good rules for bad users, versus bad rules. The answer is relevant for normative purposes as well. Understanding the psychological forces pushing toward bad rules or informal policies can provide deeper guidance about how to design political institutions ex ante to circumvent these forces. This can help prevent the boom-bust pattern in informal regulation that seems to exaggerate the effects of market bubbles.

References

- Ball, R., S. P. Kothari, and A. Robin. 2000. The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics* 29:1-51.
- Barberis, N., M. Huang, and T. Santos. 2001. Prospect theory and asset prices. *Quarterly Journal of Economics* 116: 1-53.
- Barrett, J. L. 2000. Exploring the natural foundations of religion. *Trends in Cognitive Sciences* 4: 29-34.
- Bandyopadhyay, S., C. Chen, A.G. Huang, and R. Jha. 2008. Accounting conservatism and the tradeoff between relevance and reliability of current earnings. *Contemporary Accounting Research Conference*, University of Waterloo, Waterloo, Ontario.
- Baumeister, R.F., E. Bratslavsky, C. Finkenauer, and K.D. Vohs. 2001. Bad is stronger than good. *Review of General Psychology* 5: 323-370.
- Black, F. 1993. Choosing accounting rules. *Accounting Horizons* 7(4): 1-17.
- Boyer, P. 2001. *Religion explained: Evolutionary origins of religious thought*. Basic Books, New York.
- Camerer, C., T-H. Ho, and J-K Chong. 2004. A cognitive hierarchy model of games. *Quarterly Journal of Economics* 119(3):861-898.
- Caplan, B. 2001. Rational ignorance versus rational irrationality, *Kyklos*, 54(1), 3–26.
- Chen, S., D. Matsumoto, and S. Rajgopal. 2008. Is silence golden? An empirical analysis of firms that stop giving quarterly earnings guidance. University of Washington, Working paper.
- Christensen, P. 2002. Accounting policies in agencies with moral hazard and renegotiation. *Journal of Accounting Research* 40(4): 1071-1090.
- Christensen, J. and J. Demski. 2004. Asymmetric monitoring: good versus bad news verification. *Schmalenbach Business Review* 56 (December): 206–222.
- Daniel, K., D. Hirshleifer, and S.H. Teoh. 2002. Investor psychology in capital markets: Evidence and policy implications. *Journal of Monetary Economics* 49(1): 139-209.
- DeGeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 72 (1): 1-33.

- Della Vigna, S. and J. Pollet. 2009. Investor inattention and Friday earnings announcements. *Journal of Finance* forthcoming.
- De Long, J.B., A. Shleifer, L.H. Summers, and R.J. Waldmann. 1990. Noise trader risk in financial markets *Journal of Political Economy* 98(4), 703-38.
- Dietrich, J. R., S.J. Kachelmeier, D. Kleinmuntz, and T. Linsmeier. 2001. Market efficiency, bounded rationality, and supplemental business reporting disclosures. *Journal of Accounting Research* 39(2): 243-268.
- Drake, M., J. Myers, and L. Myers. 2008. Disclosure quality and the mispricing of accruals and cash flow. University of Arkansas, Working paper. <http://ssrn.com/abstract=985949>
- Edmans, A., D. García, and N. Øyvind. 2007. Sports sentiment and stock returns. *Journal of Finance* 62(4): 1967-1998.
- Gigler, F., C. Kanodia, H. Sapa, and R. Venugopalan. 2009. Accounting conservatism and the efficiency of debt contracts. *Journal of Accounting Research* forthcoming.
- Glover, J., Y. Ijiri, C. Levine, and P. Liang. 2005. Separating facts from forecasts in financial statements. *Accounting Horizons* 19(4): 267–282.
- Graham, J., C. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40: 3–73.
- Hayek, F. 1988. *The fatal conceit: The errors of socialism*. University of Chicago Press, Chicago, IL.
- Healy, P. M. and J. M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13(4): 365-383.
- Heath, C. and A. Tversky. 1991. Preference and belief: Ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty* 4:5-28.
- Hirshleifer, D. 2001. Investor psychology and asset pricing. *Journal of Finance* 56(4): 1533-1598.
- Hirshleifer, D. 2008. Psychological bias as a driver of financial regulation. *European Financial Management* 14(5): 856-874.
- Hirshleifer, D., K. Hou, S.H. Teoh, and Y. Zhang. 2004. Do investors overvalue firms with bloated balance sheets? *Journal of Accounting and Economics* 38(1-3): 297-331.
- Hirshleifer, D. and T. Shumway. 2003. Good day sunshine: Stock returns and the weather. *Journal of Finance* 58(3):1009-1032.

- Hirshleifer, D. and S.H.Teoh. 2003. Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics* 36(1-3): 337-386.
- Hirshleifer, D., Lim, S., and Teoh, S.H., 2009. Driven to Distraction: Extraneous Events and Underreaction to Earnings News. *Journal of Finance*, forthcoming
- Hodder, L., L. Koonce, and M. McAnally. 2001. SEC market risk disclosures: implications for judgment and decision making. *Accounting Horizons* 15: 49–70.
- Holthausen R. and R.Watts. 2001. The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics* 31(1-3): 3-75.
- Ijiri, Y. 1975. *Theory of accounting measurement: Studies in accounting research*. American Accounting Association, Sarasota, Florida.
- Indjejikian, R., and D.J. Nanda. 1999. Dynamic incentives and responsibility accounting. *Journal of Accounting and Economics* 27: 177-201.
- Jensen, M. 1986. Agency cost of free cash flow, corporate finance, and takeovers. *American Economic Review* 76(2): 323-329.
- Kachelmeier, S. and R. King. 2002. Using laboratory experiments to evaluate accounting policy issues. *Accounting Horizons* 16(3): 219–32.
- Koh, K., D. Matsumoto, and S. Rajgopal. 2008. Meeting or beating analyst expectations in the post-scandals world: Changes in stock market rewards and managerial actions. University of Washington, Working paper.
- Koonce,L., M. Lipe, and M. McAnally. 2005. Judging the risk of financial instruments: problems and potential remedies. *The Accounting Review* 80: 871-895.
- Koonce, L, M. McAnally, and M. Mercer. 2005. How do investors judge the risk of financial and derivative instruments? *The Accounting Review* 80: 221-241.
- Laibson, D. 1997. Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics* 112: 443-477.
- Lev, B. 1968. The aggregation problem in financial statements: An informational approach. *Journal of Accounting Research* 6(2): 247-261.
- Libby, R., R. Bloomfield, and M. W. Nelson. 2002. Experimental research in financial accounting. *Accounting, Organizations and Society* 27(8):775–810
- Lim, S. 2006. 2006. Do investors integrate losses and segregate gains? Mental accounting and investor trading decisions. 2006. *Journal of Business* 79 (5): 2539-2573.

- Loewenstein, G., E. Weber, C. Hsee, and E. Welch. 2001. Risk as Feelings, *Psychological Bulletin*, 127: 267-86.
- Loughran, T. and J. Ritter. 1997. The operating performance of firms conducting seasoned equity offerings. *Journal of Finance*. 52: 1823-1850.
- Maines, L. A., and L. S. McDaniel. 2000. Effects of comprehensive-income characteristics on nonprofessional investors' judgments: The role of financial-statement presentation format. *The Accounting Review* 75(2): 179-207.
- McConnell, J., and C. Muscarella. 1985. Corporate capital expenditure decisions and the market value of the firm. *Journal of Financial Economics* 14: 399-422.
- Oliver, B. L. 1972. A study of confidence interval financial statements. *Journal of Accounting Research* 10(1): 154-166.
- Olsen, R. 1997. Investment risk: The experts' perspective. *Financial Analysts Journal* 53: 62-66.
- Peek, E., R. Cuijpers, and W. Buijink. 2008. Creditors' and shareholders' reporting demands in public versus private firms: Evidence from Europe. *Contemporary Accounting Research Conference*, Quebec, Canada.
- Pincus, M., S. Rajgopal, M. Venkatachalam. 2007. The accrual anomaly: International evidence. *Accounting Review* 82(1):169-203.
- Richardson, S., S. H. Teoh, and P. Wysocki. 2004. The walk-down to beatable analyst forecasts: The role of equity issuance and insider trading incentives. *Contemporary Accounting Research* 21(4): 885-924.
- Ritov, I., and J. Baron. 1990. Reluctance to vaccinate: omission bias and ambiguity. *Journal of Behavioral Decision Making* 3: 263-77.
- Rountree, B., J. Weston, and G. Allayannis. 2008. Do investors value smooth performance? *Journal of Financial Economics*. 90 (2008) 237-251
- Scheinkman, J., and W. Xiong. 2003. Overconfidence and speculative bubbles. *Journal of Political Economy* 111: 1183-1219.
- Mashruwala, C., S. Rajgopal, and T. Shevlin. 2006. Why is the accrual anomaly not arbitrated away? The role of idiosyncratic risk and transaction costs. *Journal of Accounting and Economics* 42: 3-33.
- Skinner, D., and R. Sloan. 2002. Earnings surprises, growth expectations and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies* (2/3): 289-312.

- Sloan, R. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71: 289-315.
- Sorter, G. 1969. An 'events' approach to basic accounting theory. *The Accounting Review* 44(1): 12-19.
- Sunstein, C. and R. Thaler. 2003. Libertarian paternalism is not an oxymoron. *University of Chicago Law Review* 70(4): 1159-1202.
- Teoh, S.H., I. Welch. and T.J. Wong. 1998a. Earnings management and the long run market performance of the initial public offering. *Journal of Finance* 53:1935-1974.
- Teoh, S.H., I. Welch. and T.J. Wong. 1998b. Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 51: 63-99.
- Thaler, R. 1985. Mental accounting and consumer choice. *Marketing Science* 4 (3): 199-214.
- Thaler, R., and E. Johnson. 1990. Gambling with the house money and trying to break even: the effects of prior outcomes on risky choice. *Management Science* 36(6): 643-660.
- Thornburg, S. and R. Roberts. 2008. *Accounting, Organizations and Society* 33(2-3): 229-248.
- Watts, R. and J. Zimmerman. 1978. Towards a positive theory of the determination of accounting standards. *The Accounting Review* 53(1): 112-134.
- Watts, R. and J. Zimmerman. 1979. The demand for and supply of accounting theories: the market for excuses. *The Accounting Review* 54(2): 273-305.
- Watts, R. 2003a, Conservatism in accounting Part I: Explanations and implications. *Accounting Horizons* 17(3): 207-221.
- Watts, R.. 2003b, Conservatism in accounting Part II: Evidence and research opportunities. *Accounting Horizons* 17(4): 287-301.
- Waymire, G. and S. Basu. 2008. Accounting is an evolved economic institution. *Foundations and Trends in Accounting* 2 (1-2): 1-174.
- Yates, F. and E. Stone. 1992. *The risk construct in risk-taking behavior*. F. Yates ed., New York, NY: Wiley, 1-25.