



## Macquarie University ResearchOnline

---

**This is the author version of an article published as:**

Chen, Stephen (2010) The Role of ethical leadership versus institutional constraints : a simulation study of financial misreporting by CEOs *Journal of business ethics*, 30 September 2010, pp. 1-20

**Access to the published version:** <http://dx.doi.org/10.1007/s10551-010-0625-8>

**Copyright:** Springer

The Role of Ethical Leadership versus Institutional Constraints: A Simulation Study  
of Financial Misreporting by CEOs

Stephen Chen

Department of Business

Macquarie University

Sydney NSW 2109

Australia

[Stephen.chen@mq.edu.au](mailto:Stephen.chen@mq.edu.au)

The Role of Ethical Leadership versus Institutional Constraints: A Simulation Study  
of Financial Misreporting by CEOs

Author Biography

*Stephen Chen is an Associate Professor of Business at Macquarie University. He obtained his MBA from Cranfield School of Management and his PhD in Management from Imperial College, London. He has taught previously at City University Business School, Manchester Business School, Henley Management College, Open University (UK), UCLA and the Australian National University. His research interests include corporate social responsibility of multinational firms, social entrepreneurship and management of not-for-profit organisations.*

The Role of Ethical Leadership versus Institutional Constraints: A Simulation Study  
of Financial Misreporting by CEOs

**Abstract**

*This paper examines the proposition that a major cause of the major financial accounting scandals that received much publicity around the world was unethical leadership in the companies and compares the role of unethical leaders in a variety of scenarios. Through the use of computer simulation models, it shows how a combination of CEO narcissism, financial incentive, shareholder expectations and subordinate silence as well as CEO dishonesty can do much to explain some of the findings highlighted in recent high profile financial accounting scandals. Furthermore, it shows that the nature and impact of ethical leadership depends greatly on the institutional setting and can be expected to vary greatly by country and culture. In certain circumstances ethical leadership can have either a negligible or even opposite effect to that expected.*

KEYWORDS: CEO narcissism, computer simulation, ethical leadership, financial incentives, financial misreporting

## Introduction

'O what a tangled web we weave/when first we practise to deceive' (Sir Walter Scott *Marmion*, 1808) <sup>1</sup>

The recent high profile accounting scandals involving major companies worldwide such as Enron, WorldCom, Parmalat and most recently Satyam along with recent outcries over the excessive remuneration paid to some CEOs have raised questions about the relationship between ethical leadership, financial incentives and financial misreporting (Perel, 2003). One view of these failures is based on the assumption that the problem lies with the character and integrity of some CEOs who have been motivated by personal financial gains resulting from performance bonuses. According to this view, these scandals have occurred because the individuals holding leadership roles in the corporations lacked integrity and deliberately misled investors in order to protect high bonuses linked to the company share price performance. It is argued that this shows a need to reform the morals of CEOs in order to prevent such scandals in future (Bragues, 2008).

However, on a closer inspection the claim that much of the blame for these financial scandals can be explained simply by the unethical character of the CEOs seems to lack strong evidential support. A review of the profiles of many of the CEOs cited as examples of unethical leaders shows that in most cases there is no history of prior fraud by the offending CEOs and most have been exemplary citizens in other aspects of their life. In many cases, they have made significant contributions to charitable causes and other people have testified to the otherwise good character of these CEOs. For example, Bernard Ebbers, former CEO of Worldcom, gave \$100

million to charity over 10 years, including a multimillion-dollar fundraising effort he led to renovate his alma mater, Mississippi College and \$50,000 to rebuild a children's playground after a fire. Similarly Kenneth Lay, the former CEO of Enron committed almost \$10 million to good causes between 2001 and 2005. Ramalinga Raju, the former CEO of Satyam, was a major contributor to non-profit foundations such as the Byrraju Foundation and EMRI (Emergency Management and Research Institute). These accounts would suggest that these CEOs were not entirely motivated by personal financial gain and had a "bad" character. What then led these otherwise upstanding executives to perpetrate such massive frauds?

This paper suggests that in order to answer this question it is necessary to look beyond the ethical character of individual CEOs and to examine other factors that may have led the CEOs to take such actions. Research in a number of disciplines including accounting, economics, sociology, criminology and psychology suggests that there are significant international differences in the institutional environment which may affect financial misreporting, such as legal penalties (Leuz et al, 2002; Bushman and Pitroski, 2006), whistleblowing (Tavakoli et al, 2003), cultural constraints (Koopman et al, 1999; Aycan et al, 2000) and relationships between the CEO, shareholders and subordinates (Aguilera and Jackson, 2003). Much of this research has been ignored in previous discussions which have focused largely on the ethical character of the CEO.

Secondly, the paper seeks to make a contribution to methodology in business ethics. In line with other authors (e.g. Harman, 2003) who have adopted a social science approach to questions of business ethics, I believe it is important to test the validity of such explanations and recommendations against real world data if we are to make

recommendations for managerial practice (Robertson, 1993). This paper introduces the use of computer simulations as a way to explore and test some of the arguments presented by other researchers and test the possible role of other factors. Computer simulation has become an increasingly popular methodological approach in the management literature but has not been much used in the business ethics literature, apart from a handful of studies (e.g. Miller and Engemann, 2004). Therefore, a second aim of this paper is to show how simulations can be a powerful tool that can be used to examine questions in business ethics in the absence of data from real life and to provide support for studies based on real life cases.

The rest of this paper is structured as follows. Firstly, we review some of the previous research on ethical leadership and financial misreporting, referring to relevant research in psychology, criminology, sociology and accounting as well as business ethics. Then we describe the simulation method and discuss some key results obtained from the simulations before concluding with some general lessons gleaned from the simulations and suggestions for further research.

### **Previous research**

There are many types of financial fraud ranging from simple misappropriation of company funds to complex money laundering and fraudulent investment schemes (Interpol <http://www.interpol.int>). This paper focuses on misreporting of financial accounts as highlighted in high profile cases such as Enron, Parmalat and Worldcom. Many explanations for these accounting frauds have been offered by

scholars from different disciplines including accounting, management, economics and psychology as well as business ethics.

### *Unethical leadership or victim of circumstances*

Most research on financial fraud in the business ethics literature has focused on the character and integrity of individual CEOs (Bragues, 2008; Morrison, 2001) and sought to answer the question of what ethical leaders should do from a purely philosophical perspective based on deontological principles such as those of Kant (1724-1804) or based on virtue ethics drawn from Greek philosophers such as Aristotle and Plato (Knights and O'Leary, 2006). According to the predominant view, CEOs bear primary responsibility for financial misreporting not only because they are the ones who need to sign off on financial reports to shareholders but also because they have the power to shape the ethical climate of the organisation through their own behaviour and through changes in the organisational management systems and procedures (Sims and Brinkmann, 2003). In contrast, Brown and Trevino (2005, 2006) adopt a social scientific approach. This involves considering situational influences such as the ethical context, outcomes such as follower satisfaction and individual leader characteristics such as moral reasoning and machiavellianism, drawn from social psychological theories such as social learning theory (Bandura, 1977) and leadership theories in the management literature (e.g. Burns, 1978).

A key area of contention between the two schools of thought is the role of moral agency versus determinism. As discussed by Solomon (2003), if there is strict determinism, there can be no agency, and thus no moral responsibility. Two kinds of determinism can be distinguished. The first is determination by external circumstances; the second is determination within the individual, by his or her

character. Most commentators are willing to admit a problem in ascribing moral responsibility in the former case, but not in the latter. Harman (2003) and Doris (2002) go even further and, based on empirical studies in social psychology, they deny the existence of individual character, by which they mean an individual's established disposition. For instance, they cite the well-known 'electric shock' experiments by Milgram (1974) which demonstrated that ordinary people can be induced to carry out brutal acts under orders from an authority figure. Several lines of research from other disciplines also highlight the importance of external factors.

### *Institutional factors*

The significance of external factors is most strongly supported by research which has examined the effect of the institutional environment on corporate behaviour. Firstly, two related lines of research highlight the importance of the institutional environment in determining responsible and irresponsible behaviour by organizational leaders. The first comes from research on the causes of corruption in different societies (Treisman, 2000; Getz and Volkema, 2001). Several studies have shown how the level of corporate and individual corruption in a country, including the level of financial misreporting, can be related to the presence or lack of institutions in that country (Li et al, 2008). The second line of research comes from research on corporate social responsibility (CSR). While CSR reporting is often voluntary and so the findings may not be strictly comparable to financial reporting, which in most cases is mandatory, a number of studies suggest that corporate social activities and reporting behaviour differs by country (Chen and Bouvain, 2009) as predicted by comparative institutional theorists (Aguilera and Jackson, 2003).

Institutional theorists argue that organizational actions are both enabled and constrained by institutional factors which include regulative, normative and cognitive factors (Scott, 1995). Regulative aspects of the institutional environment include regulations and laws that guide organizational actions through coercion or sanctions. For instance, differences in the development of legal institutions as well as legal penalties for financial fraud (Hodgson and Jiang, 2007; Mocan, 2008) and the general level of corruption in the country (Davis and Ruhe, 2003) have been cited as possible factors leading to differences in corruption between countries.

Normative factors take the form of generally accepted standards and expectations, most clearly delineated in legitimacy theory which argues that the continued existence of any institution, including a business, depends on its social legitimacy (Suchman, 1995). In this view, acts such as charitable contributions and social/environmental reporting may be purely for the purposes of securing legitimacy in the eyes of key stakeholders (Chen et al, 2008).

Other studies have shown the importance of cultural norms in determining the ethical behaviour of leaders. For instance, the GLOBE study (Waldman et al, 2006; Resick et al, 2006) which compared perceptions of leadership across a number of countries found that character/integrity was endorsed to a lesser extent among Middle Eastern societies compared with Nordic societies. On the other hand, altruism was endorsed most in South East Asian societies and least among Nordic societies. These cultural norms can act to restrain the occurrence of financial misreporting as well as the likelihood of whistleblowing without the need for formal governance mechanisms (Tavakoli et al, 2003).

The institutional perspective provides an overarching framework which encompasses a variety of internal and external constraints on firm behaviour some of which have been examined in more detail by researchers from other disciplines. Three in particular are discussed below: financial incentive systems for CEOs, CEO career progression and CEO narcissism.

### *Financial incentives*

Accounting and economics researchers have focused on the financial incentives for CEOs to misreport financial performance (Burns and Kedia, 2006). As commented by Carson (2003) one of the greatest lessons from the recent accounting scandals is the role of the incentives for unethical behaviour created by financial incentive schemes for CEOs of major corporations. Several recent papers investigate the potential costs and financial benefits of actions taken by managers to misreport financial performance, including legal liability, a decline in stock price, and management turnover (Reinstein et al, 2006). Most rely on agency theory (Jensen and Meckling, 1976), which focuses on the role of the CEO as a self-interested agent. In accordance with Becker's (1968) theory of crime, this view assumes that the decision to misreport financial performance is influenced by the CEO's personal assessment of the expected benefits versus possible penalties, especially when the CEO owns stock options in the company or when the CEO's bonus payments are linked to the performance of the company (Efendi et al, 2007; Zhang et al, 2008).

The problem is accentuated because increasingly many CEOs are now assessed on the "bottom line" of achieving expectations set by financial analysts and investors. For example, as stated by Sims and Brinkmann (2003), in Enron: 'A negative earnings outlook would have been a red flag to investors, indicating Enron was not

as successful as it appeared. If investors' concerns drove down the stock price due to excessive selling, credit agencies would be forced to downgrade Enron's credit rating. Trading partners would lose faith in the company, trade elsewhere, and Enron's ability to generate quality earnings and cash flows would suffer.' (p. 245)

However, financial incentives for CEOs vary considerably by country. For example, although Kaplan (2008) notes that the differences are diminishing, Conyon et al (2000) found that after controlling for firm size, sector and other firm and executive characteristics, CEOs in the US earned 45% higher cash compensation and 190% higher total compensation compared with CEOs in the UK, a difference they attribute to political and cultural differences between the two countries.

### *Career concerns*

Longer term career concerns can also encourage misreporting by CEOs. Although accusations of financial fraud by CEOs carry a stigma (Pozner, 2008), there is also evidence that the failure to achieve financial targets can also be a cause of stigma for executives (Semadeni et al, 2008) and can affect the future employability of CEOs. The career concerns literature (Boyer and Ortiz-Molina, 2008) argues that while career concerns can potentially mitigate agency problems between managers and shareholders (Fama, 1980), they can also induce CEOs to take risky actions that improve their chances of appointment in the future. Such concerns arise from both the external labour market, which provides managers with outside opportunities, and the internal labour market, which determines how a manager is promoted in his own organization. Managers realize that, if they perform poorly, their employability will decline.

However, once again there may be differences depending on the institutional environment. Aycan et al (2000) in a comparison of ten countries found that socio-cultural factors influenced HRM practices including the use of performance-based rewards as well as job design and supervisory practices in companies. Other differences between countries in managerial career paths may also influence management career concerns. For instance, although it is now changing, the traditional lifetime employment policy that is typical of Japanese companies is quite different from that in US firms (Ono, 2007).

#### *Narcissism and CEO overconfidence*

In contrast, psychological research on financial misreporting has focused on the non-financial motivations of offending CEOs. One body of work points to the overconfidence of CEOs who believe that they can achieve the misstated targets. Overconfidence refers to an inflated subjective probability of a particular outcome occurring. Two main categories of explanations have been offered for overconfidence: (a) biases in information processing and (b) effects of unbiased judgmental error.

According to this perspective, financial misreporting may result not simply from a desire of CEOs to inflate earnings for self-benefit but from misjudgement of the true performance. In reporting firm performance CEO's may initially form a tentative estimate of performance and then with this answer in mind, they search for more

evidence to support that initial estimate and this initial estimate also colours the interpretation of subsequent evidence.

This overconfidence can result from a number of causes such as incorrect assessment of information (Erev, Wallsten, & Budescu, 1994) and the predictive value of different sources of information (Soll, 1996). Some studies suggest that the greatest overestimation comes mostly from poor performers. Kruger and Dunning (1999) argue that this happens because people who perform poorly at a task also lack the metacognitive skill to realize that they have performed poorly. On the other hand, people who are more skilled have both the ability to perform well and the ability to accurately assess the superiority of their performance. In many situations, motivational factors can exacerbate the bias. Many studies have shown that people like to think that they are more intelligent and knowledgeable than they may actually be (Larrick, 1993).

One group of individuals which has been shown to be particularly prone to overconfidence are those who exhibit a high degree of narcissism. Ellis (1898) introduced narcissism to the psychology literature, drawing the term from the young man in Greek mythology, Narcissus, who fell in love with his own reflection in a pool and ultimately perished as a result of his self-preoccupation. The concept had a major influence on Freud (1957), who described various manifestations of narcissism, including self-love, self-admiration, self-aggrandizement, and a tendency to see others as an extension of one's self.

Narcissists rate themselves highly (and more highly than is objectively warranted) on an array of dimensions, including intelligence, creativity, competence, and leadership abilities (Farwell and Wohlwend-Lloyd, 1998). Narcissists also have an intense need to have one's superiority reaffirmed and, although self-admiring, they crave further admiration in the forms of affirmation, applause, and adulation (Emmons, 1981; Wallace and Baumeister, 2002). As Kets de Vries (2003) has noted, such personality traits are often found in corporate leaders:

'Indeed it is only to be expected that many narcissistic people, with their need for power, prestige, and glamour, eventually end up in leadership positions. Their sense of drama, their ability to manipulate others, their knack for establishing quick, superficial relationships serve them well in organizational life.' (Kets de Vries, 2003, p. 23)

Schwartz (1991) has even gone as far as to argue that some organisations suffering from what he terms 'organisational totalitarianism' foster and encourage corporate narcissism.

Narcissism can be expected to affect the CEO's judgment of the likelihood of various outcomes. Actions that would be considered as being infeasible, or unlikely to succeed, by most people might be seen in a positive light by highly narcissistic CEOs who crave the attention that such bold actions attract (Emmons, 1981; Wallace and Baumeister, 2002). Such behaviours can be accentuated by the actions of the financial press and others who praise those CEOs who take bold decisions (Hayward et al, 2004). Narcissists are also likely to view themselves as Nietzschean 'overmen' (*Übermensch*) to whom the ordinary rules do not apply (Norberg, 2009). This can lead to a greater likelihood to carry out unethical acts and can provide a rationalisation for these acts (Zyglidopoulos et al, 2009), an extreme example being the use by the Nazis of Nietzsche's philosophy to justify unconscionable acts of cruelty (Ascheim, 1994). [It should be added that Nietzsche himself never advocated or supported such acts in his writings.]

Narcissism too seems to be culturally dependent. Narcissism has been found to be less prevalent in some societies, particularly ones where collectivism and humility are valued (Morris et al, 2005). Koopman et al (1999) in a comparison of 21 European countries found significant differences in a number of preferred leadership dimensions including narcissistic leadership while Trevor-Roberts et al (2003) in a related study comparing leadership styles in Australia and New Zealand again found significant differences in a number of leadership dimensions including narcissism.

## **Methodology**

Institutional theory would, therefore, predict the extent of financial misreporting should vary by country depending on several factors in the institutional environment. However, a key methodological problem in investigating financial misreporting and many other forms of socially undesirable behaviour is the difficulty of obtaining reliable data. Most researchers have thus been forced to rely on anecdotal evidence or unreliable and incomplete survey data. Although such studies have provided useful insights in certain cases, the idiosyncrasies of each case often make generalisation and testing of hypotheses difficult. As it was not feasible to test differences in financial misreporting between organisations in different countries owing to a lack of reliable data, I used a series of computer simulations to test how varying levels of CEO confidence and honesty and shareholder expectations might influence the degree to which financial misreporting takes place. Then I examined the effect of various institutional constraints including legalistic control and whistleblowing by subordinates on financial misreporting by CEOs.

Simulation is defined as a method for using computer software to model the operation of “real world” processes, systems, or events by creating a computational representation of the underlying theoretical logic that links constructs together within these simplified worlds (Davis et al, 2007). These representations are then coded into software that is run repeatedly under varying experimental conditions such as alternative assumptions and different values of key variables in order to test the effects and the validity of certain hypotheses. Simulation has become an increasingly significant methodological approach to theory development in the organisational science literature (Harrison et al, 2007) and several influential research papers in organisational science have resulted from the use of simulations (e.g., Cohen, March, & Olsen, 1972; March, 1991).

Simulation has several advantages over other methods. For example, it can also provide an analytically precise means of specifying the assumptions and theoretical logic especially when there are challenging empirical data limitations or when the complexity of interactions in the system precludes simple analytical methods. In particular simulations have been useful in showing how complex, seemingly chaotic behaviours can result from simple processes (Anderson, 1999).

Several simulation approaches have been used for theory development in the organizational literature including system dynamics (Rudolph & Repenning, 2002), NK fitness landscapes (Levinthal, 1997), genetic algorithms (Bruderer & Singh, 1996) and cellular automata (Lomi & Larsen, 1996). In this paper I use the well-known system dynamics approach (Forrester, 1961; Sterman, 2000), which focuses on how causal relationships among constructs can influence the behaviour of a system. The approach typically models a system (e.g. an organization) as a series of simple

processes with circular causality (e.g., variable A influences variable B, which influences variable A). These causal loops can be positive such that feedback is self-reinforcing and amplifying, or negative such that feedback is dampening. While each process may be well-understood, their interactions are often difficult to predict.

System dynamics simulations are particularly useful for understanding the initial conditions that lead to abrupt, nonlinear changes, such as tipping points, catastrophes, and the emergence of vicious or virtuous cycles. Rudolf and Repenning (2002), for example, used system dynamics to examine why minor interruptions sometimes trigger sudden catastrophes within organizations. In this paper, I employ system dynamics in order to examine the cycle of increasing financial misreporting that has been noted in many high profile cases.

I used Vensim, a visual modelling tool that allows the construction of simulation models from causal loop or stock and flow diagrams. By connecting words with arrows, relationships among system variables are entered and recorded as causal connections. This diagram can then be used as the basis for constructing a series of equations linking the variables in the model. When all the variables and their relationships have been specified, the behaviour of the model can then be explored with different values of the variables.

In creating and testing simulation models, a balance needs to be struck between realism and purpose of the model (Burton and Obel, 1995). While complex models that include many variables may be more realistic, their outcomes are often difficult to analyse and so they may not achieve the purpose of the modelling exercise. The

purpose of the models here was to serve as instruments for Socratic dialogue (Morrell, 2004) rather than forecasting or predicting so simple but plausible models were preferred to complex but possibly more realistic models. The aim is to expose inconsistencies and contradictions in accepted beliefs (Morrell, p. 386). Socrates would have done it through philosophical dialogue and argumentation. In this paper we examine the validity of propositions by testing them in computer simulation models of various hypothetical but plausible scenarios. By isolating certain key variables and excluding other variables which may lead to noisy results, we are able to carry out controlled experiments, something which cannot be done in the real world.

Model building is an iterative process so many models were tried and discarded before nine models were eventually selected, which although fairly simple, capture succinctly the variables and relationships which have been highlighted as significant by other researchers as well as demonstrating the observed behaviours described in well-publicised cases of financial misreporting. The variables and their relationships examined are listed in table 1 and the results are summarized in table 2. Each model is discussed in detail below.

\*\*\*\*\*Table 1 here\*\*\*\*\*

\*\*\*\*\*Table 2 here\*\*\*\*\*

### **Control model**

### *Model 1: Baseline model*

Figure 1 here

Figure 1 shows the baseline model with stable shareholder expectations. This models the growth and expected growth in firm assets as two processes that need to be aligned. Variables are shown as text, stocks are shown as boxes and causal relationships are shown as arrows. Thus, reading from left to right, shareholder expected assets are determined by the average industry growth which increases or decreases the expected value of the firm each year. At the same time the real value of the firm's assets are determined by the actual firm performance each year. The difference between the expected and actual values gives rise to a shortfall which must be corrected by the CEO. One way is to improve the firm performance. The alternative is to misstate the value of the firm assets in the financial report to shareholders.

In the baseline model it is assumed that:

1. shareholders expect at least average industry performance (10%),
2. initial firm assets are \$100 m,
3. firm assets increase steadily at a rate of \$4, 8, 12, 16 and 20m from years 1 to 5 then at a constant \$20m per year,

4. if the real assets are less than the expected value, the CEO restates real assets to meet shareholder expectations by an amount depending on his/her dishonesty and confidence.

As expected, the level of misreporting increases over years 1-5 but then remains steady as the firm outperforms the market.

### **Unrestrained growth models**

The next four models examine the effects of CEO dishonesty, narcissism and shareholder expectations on the level of financial misreporting.

#### *Model 2: Dishonest CEO*

Figure 2 here

In model 2 we examine the effect of CEO dishonesty. Based on research in criminology which suggests that many repeat offenders go on to commit more serious crimes, especially when they get away with it (Blumstein et al, 2006), it is assumed that misreporting CEOs who get away with it tend to misreport more over time. The model shows that the result is a steady increase in misreporting to \$550 in year 6 and misreporting remains at that level thereafter.

### *Model 3: Narcissistic CEO*

Figure 3 here

In model 3 we include the effect of including a feedback loop between CEO confidence and reported assets. CEO confidence is measured as a percentage of the firm's asset growth. This is based on the assumption that a CEO's ego will be bolstered by a significant increase in the firm's value and corresponds to the scenario postulated by Hayward et al (2004) that CEOs who believe their own press start believing that they can accomplish more than they can and so have an even greater tendency to misreport firm performance which in turn leads to overconfidence which further increases their tendency to misreport. The effect will be particularly strong in narcissistic CEOs will tend to misreport assets due to overconfidence (Kruger and Dunning, 1999), rationalisation of wrongdoing (Zyglidopoulos et al, 2009) and craving for the attention it creates (Wallace and Baumeister, 2002). Plenty of examples of such CEOs can be found in real life from John DeLorean in the 1980's (Conger, 1990) to Jeff Skilling in the 1990's. The model shows an exponential increase in misreporting to \$2,300 in year 6, which remains steady thereafter.

### *Model 4: Narcissistic and dishonest CEO*

Figure 4 here

In model 4 we include the joint effect of CEO dishonesty and CEO narcissism. The result is a an exponential growth pattern for misreporting as in model 3 but increasing to a higher level of 3,000 in year 6 and remaining steady thereafter.

*Model 5: Narcissistic, dishonest CEO and rising shareholder expectations*

Figure 5 here

In model 5 we add the additional assumption that shareholders have a minimum expectation of industry average increase in assets per year but if the firm performed better than the industry average in the previous year then this becomes the expected performance. As demonstrated in recent cases, such a scenario is well within the realms of reality. In the Enron case share prices quadrupled in the four years 1997-2000 but few shareholders raised any concerns and many expected such growth to continue. As the model shows, including this assumption creates a positive feedback loop that results in increasing shareholder expectations and an exponential increase in misreporting which now reaches \$43bn in year 7. It is also noteworthy that this increase occurs even when the firm is outperforming the industry average (from year 3 onwards) since the firm gets trapped in a vicious cycle of better firm performance leading to ever increasing shareholder expectations which it cannot meet.

### **Models with restraints**

Models 6-9 examine the effects of introducing various explicit and implicit institutional constraints on CEO behaviour (Scott, 1995; Matten and Moon, 2008): formal legalistic controls, whistleblowing by subordinates, social constraints on CEO behaviour and social norms for shareholder behaviour.

*Model 6: Legalistic control*

Figure 6 here

Model 6 tests the effect of formal controls such as legal penalties on misreporting. This corresponds to countries with strong legal institutions that deter financial misreporting. The penalty is determined by the degree of misreporting, the chances of discovery and the penalty rate. As depicted in the graphs, and as might be expected, the effect of introducing penalties for misreporting is a general reduction in the level of misreporting. However, what is also interesting is that increasing CEO dishonesty does not always lead to an increase in misreporting. Increasing CEO dishonesty from 30% to 50% results in an increase in misreporting in years 1 to 7 but results in a decrease in misreporting in year 8 and onwards as increasing financial penalties start to reduce the level of misreporting.

*Model 7: Whistleblowing subordinates*

Figure 7

Model 7 tests the scenario where subordinates actively engage in whistleblowing (Taylor and Curtis, 2010). This models the effect in societies such as Scandinavia and the US where there is relatively low power distance (Hofstede, 1980) and subordinates are freer to criticize their leaders compared with high power distance societies such as Korea (Park et al, 2005) or Croatia (Tavakoli, 2003) where subordinates are culturally constrained from criticizing their leaders and keep quiet about wrongdoing. Now it is assumed that subordinate whistleblowing increases the chances of discovery of wrongdoing. As expected, this results in a substantial decrease in the amount of misreporting to a maximum of \$8,500 with 10% whistleblowing. However, what is also shown is that like the relationship between CEO dishonesty and misreporting in model 6, the relationship between whistleblowing and misreporting is not always downward sloping. Increasing whistleblowing does not always lead to a decrease in misreporting. While increasing whistleblowing from 10% to 50% results in a decrease in misreporting in years 7-10 and onwards, increasing whistleblowing from 50% to 90% results in a decrease in years 6-8 but an increase in misreporting in years 9 to 10. This is because a high level of whistleblowing increases the chance of discovery which increases the penalty and decreases the level of misreporting but in turn this has the opposite effect of reducing the chance of discovery.

#### *Model 8: Social constraints on CEOs*

Model 8 tests the effect of reducing CEO overconfidence. This corresponds to countries where there are social constraints on self aggrandisement (Morrison et al, 2005). The results show that even a small change in CEO overconfidence can have a dramatic effect on misreporting. Reducing the CEO confidence values in model 5

by 10% results in a 90% drop in the value of misreporting in year 7 which now reaches \$ 4.5bn compared with \$43bn in model 5.

#### *Model 9: Social constraints on shareholders*

Model 9 tests the effect of restraining shareholder expectations. This models the case in many Continental European countries where shareholders have less power compared with other stakeholders such as workers and government and have lower expectations. The results show that even a small change in shareholder expectations results in a massive decrease in misreporting. A 10% reduction in shareholder expectations of above average industry performance leads to a 78% drop in the value of misreporting in year 7 to \$9.5bn compared with \$43bn in model 5.

### **Discussion**

One of the clearest findings from the simulations is the significant effect of positive feedback loops in the models in determining the level of financial misreporting by firms. This supports the theoretical models and empirical studies which have found the importance of various self-sustaining cycles in corruption at the societal level (Andvig and Moene, 1990) and shows how this can extend to corruption at the firm level.

The most significant feedback loop is that between firm performance and shareholder expectations. This finding is consistent with the anecdotal reports by CEOs and

others who report how increasing expectations from shareholders and the market have been influential motives in some key financial accounting scandals such as Enron (Sims and Brinkmann, 2003). It is also consistent with the accounts from CEOs of how they got trapped in cycles of misreporting, which echo Sir Walter Scott's quote at the beginning of this paper. For instance, Satyam's CEO, Ramalinga Raju in his resignation statement described it as follows:

*What started as a marginal gap between actual operating profit and the one reflected in the book of accounts continued to grow over the years... The differential in the real profits and the one reflected in the books was further accentuated by the fact that the company had to carry additional resources and assets to justify higher level of operations – thereby significantly increasing the costs...It was like riding a tiger, not knowing how to get off without being eaten.*

It is also consistent with theoretical models of self-fulfilling cycles of corruption which have been proposed elsewhere (e.g. Andvig and Moene, 1990) as well as findings in other real life cases. Similar vicious cycles of decline have been identified in Enron (Sims and Brinkmann, 2003) and Nortel (Fogarty et al, 2009). It also provides support for theoretical explanations of escalating cycles of corruption in organisations (Zyglidopoulos et al, 2009; den Niuewenboer and Kaptein, 2007; Street et al, 1997). One implication of the analysis presented here is that more attention needs to be paid to the responsibilities of shareholders, financial analysts and the financial press in setting realistic expectations for companies. Simply focusing on improving the ethical behaviour of individual CEOs without removing this root cause is unlikely to have much effect on the level and frequency of misreporting.

The findings should not be taken as an apologetic for financial misreporting by CEOs. The majority of CEOs do not engage in such behaviour despite extreme pressures. However, the simulations suggest that even well meaning CEOs who make small misstatements in the belief that it will lead to no long-term harm may get caught up in cycles of increasing misreporting from which they find it difficult to extricate themselves. This can occur even if the performance of the firm is above the industry average. In some cases such as the one modelled, whether the CEO is honest or dishonest makes little difference compared with other factors.

A second significant feedback loop is that between firm performance and CEO confidence. When CEOs and others believe that they alone are responsible for the firm's high performance (and are rewarded financially or psychologically based on that belief) there is a strong tendency to exaggerate firm performance in order to bolster the CEOs ever increasing ego. This tendency can be fuelled by commentary from the press and others who foster that belief. As shown in model 5, adding this relationship results in an acceleration of the level of misstatement of performance as another vicious cycle is created in which higher reported assets increase the CEO's confidence which in turn increases the need to misreport performance in order to feed an ever increasing ego.

As expected, model 6 shows that misreporting can be reduced to a low level or eliminated completely by increasing penalties and risk of detection. This is consistent with findings in other areas of legal enforcement such as tax fraud that even a small change in penalties and detection can have a significant deterrent effect (Feld and Frey, 2007). However, the fact that the relationship between CEO dishonesty and misreporting is not always upwards sloping also highlights the importance of

examining the outcomes of interactions between CEO dishonesty and legal constraints, which can sometimes lead to unexpected results.

As shown in model 7, in societies where there is a higher level of whistleblowing, generally the effect is to reduce the level of misreporting compared to societies where there is no whistleblowing. However, the models also show that the effect depends critically on the level of whistleblowing relative to penalties and misreporting. In some circumstances, contrary to expectations, an increase in whistleblowing can actually lead to an increase in financial misreporting. As with legal penalties it highlights the importance of considering interactions with other variables.

What is also interesting is that the simulations show that the same effect can be achieved by removing the feedback loops between reported firm assets and CEO confidence as in model 8 or between reported firm assets and shareholder expectations as in model 9. These simulations suggest that informal social constraints on CEO and shareholder behaviour can be just as effective at reducing the extent of financial misreporting as legalistic controls.

## **Conclusion**

There are many factors that have been identified as possible contributing factors to explain financial misreporting by CEOs. However, most previous studies have focused on only one or two key factors from a single disciplinary perspective and

there are few studies that have taken a more comprehensive view of the issue incorporating findings from different disciplines. One aim of this research, therefore, was to examine how these findings might be integrated in a single model. Secondly, given the large number of possible factors that have been suggested, another aim was to test the relative significance of ethical leadership in different institutional settings as well as examine the possible interactions between variables. Lastly, given the widespread public interest in the issue, another aim of this research was to test the efficacy of the various solutions to the problem of financial misreporting that have been proposed or developed in different countries, in particular, the importance of ethical character of the leader, which has been cited by many authors as a general cure for this problem, compared with other solutions.

This paper has argued for the need to integrate findings from research from other fields of social science as well as philosophy in examining questions of ethical leadership. Questions about ethics of corporate leaders are inevitably bound up with questions of personal motives, responsibility to shareholders and other stakeholders and organisational incentive structures. While it does not entirely resolve the question about the individual moral responsibility of corporate leaders in financial misreporting cases, it does demonstrate that based on empirical findings in psychology, criminology and other fields, it is perfectly plausible that in certain circumstances the ethical character of leaders is of less consequence than many have argued. In some cases CEO dishonesty can hypothetically even lead to less misreporting, contrary to expectations.

The models also show clearly the need to take into account the institutional environment in which firms operate. In particular, while not completely absolving

CEOs of blame for corporate malfeasance, they also suggest that other individuals and groups including subordinates, shareholders, financial analysts and the financial press can significantly affect the level of misreporting and should bear some of the blame. This lends weight to the recent theoretical arguments for 'connected moral agency' rather than individual moral agency (Watson et al, 2007) and the importance of considering moral agency in the context of different institutional environments (Wagner-Tsukumoto, 2005).

Secondly, the paper raises some questions about the possible "dark side" of leadership (Conger, 1990). The leadership qualities much admired in many CEOs such as drive, confidence, charisma and good impression management while sometimes capable of producing exceptional results for the organisation can also in the wrong set of circumstances lead to its downfall. The models show how a combination of a narcissistic and dishonest CEO in conjunction with increasing shareholder expectations and acquiescent subordinates can easily lead to self-propelling increasing cycles of financial misreporting.

Thirdly, the paper suggests some ways in which the extent of financial misreporting may be reduced. The simulations suggest that one of the keys to reducing financial misreporting is breaking the feedback loops that sustain a cycle of misreporting. They also provide further support for the argument that informal social constraints, such as social and individual restraints on behaviour, can be more effective in reducing corporate fraud and encouraging responsible behaviour than formal control mechanisms (Tavakoli et al, 2003; Matten and Moon, 2008). This may also explain why financial misreporting appears to be less prevalent in certain countries or cultures. In contrast to praising and emulating the celebrity leaders who are often the

focus of attention but who often also are prone to excesses, we may do well to learn from cultures and religions across the world which advocate humility as a virtue (Morris et al 2005).

Finally, the paper provides an example of how simulation methods can be used in business ethics to investigate hypothetical relationships between factors where there is a lack of real-world empirical data and it is difficult to use conventional methods. This has applications beyond financial misreporting to other forms of unethical behaviour.

### **Limitations and Future Research**

There are clearly limitations in the models and much more work could be done. Firstly, in order to simplify the analysis we have not examined in this paper the role of other stakeholders such as suppliers, customers and competitors, nor other potentially significant factors such as firm ownership structures, tax compliance systems, culture, etc. These other factors could be included in more complex models although it is unlikely that the conclusions presented here about the key effects of feedback loops between CEOs, subordinates and shareholders would be changed.

Secondly, I have not tested the model against real world data. It has proven surprisingly difficult to obtain reliable figures, for example, on the percentage of CEO pay that is linked to company performance or how the level of penalties affects financial misreporting. One of the reasons for using computer simulations was

precisely to overcome the difficulty of obtaining such data. However, if real world data is available, further studies could test the simulations using this data or else test the propositions derived from the simulations using other methods. In particular, it would be useful to examine data on financial misreporting in different countries to see if the effects vary across countries as predicted.

## Notes

<sup>1</sup> I am grateful to an anonymous reviewer for this quote, which reminds us that the scenarios described in this paper are not confined to financial misreporting by CEOs.

## References

- Aguilera, R. V. and G. Jackson: 2003, 'The Cross-National Diversity of Corporate Governance: Dimensions and Determinants', *Academy of Management Review* **28** (3), 447–465.
- Anderson, P.: 1999, 'Complexity Theory and Organization Science', *Organization Science* **10** (3), 216-232.
- Andvig, J.C. and K.O. Moene: 1990, 'How Corruption May Corrupt', *Journal of Economic Behavior and Organization* **13**, 63-76.
- Aschheim, S.E.: 1994, *The Nietzsche Legacy in Germany 1890 – 1990* (University of California Press, Berkeley)
- Aycan, Z., R.N. Kanungo, M.Mendonca, K. Yu, J. Deller, G. Stahl and A. Kurshid: 2000, 'Impact of Culture on Human Resource Management Practices: A 10-country Comparison', *Applied Psychology: An International Review* **49** (1), 192-221.
- Bandura, A.: 1977, *Social learning theory* (Prentice–Hall: Englewood Cliffs, NJ)
- Becker, G.S.: 1968, 'Crime and punishment: an economic approach', *Journal of Political Economy* **76**, 169–217.
- Blumstein, A., J. Cohen & D.P. Farrington: 2006, 'Criminal career research: its value for criminology', *Criminology* **26** (1), 1-35.
- Boyer, M.M. and H. Ortiz-Molina: 2008, 'Career Concerns of Top Executives, Managerial Ownership and CEO Succession', *Corporate Governance* **16** (3), 178-193.

- Bragues, G.: 2008, 'The Ancients against the Moderns: Focusing on the Character of Corporate Leaders', *Journal of Business Ethics* **78**, 373–387.
- Brown, M. E., L.K. Treviño and D. Harrison: 2005, 'Ethical leadership: A social learning perspective for construct development and testing', *Organizational Behavior and Human Decision Processes* **97**, 117–134.
- Brown, M.E. and L.K. Treviño: 2006, 'Ethical leadership: A review and future directions', *The Leadership Quarterly* **17**, 595–616.
- Bruderer, E., & J.S. Singh: 1996, 'Organizational evolution, learning, and selection: A genetic-algorithm-based model', *Academy of Management Journal* **39**, 1322–1349.
- Burns, J. M.: 1978, *Leadership* (Harper & Row: New York).
- Burns, N. and Kedia, S.: 2006, 'The impact of performance-based compensation on misreporting', *Journal of Financial Economics* **79**, 35–67.
- Burton, R.M. and B. Obel: 1995, 'The Validity of Computational Models in Organization Science: From Model Realism to Purpose of the Model', *Computational and Mathematical Organization Theory* **1** (1), 57-71.
- Bushman, R.M and J.D. Piotroski: 2006, 'Financial reporting incentives for conservative accounting: The influence of legal and political institutions', *Journal of Accounting and Economics* **42**, 107–148.
- Carson, T.L.: 2003, 'Self-Interest and Business Ethics: Some Lessons of the Recent Corporate Scandals', *Journal of Business Ethics* **43** (4), 389-394.
- Chen, J.C., D. Patten and R.W. Roberts: 2008, 'Corporate Charitable Contributions: A Corporate Social Performance or Legitimacy Strategy', *Journal of Business Ethics* **82**, 131-144.
- Chen, S., Bouvain, P.: 2009, 'Is Corporate Responsibility Converging? A Comparison of Corporate Responsibility Reporting in the USA, UK, Australia, and Germany', *Journal of Business Ethics* **87**, 299-317.

- Cohen, M. D., J.G. March & J.P. Olsen: 1972, 'A garbage can model of organizational choice', *Administrative Science Quarterly* **17**, 1–25.
- Conger, J.: 1990, 'The dark side of leadership', *Organizational Dynamics* **19**, 44–55.
- Conyon, M.J. and K.J. Murphy: 2000, 'The Prince and the Pauper: CEO Pay in the United States and United Kingdom', *Economic Journal* **110**, 640–671.
- Davis, J.P., K.M. Eisenhardt and C.B. Bingham: 2007, 'Developing Theory Through Simulation Methods', *Academy of Management Review* **32** (2), 480–499.
- Davis, J.H. and J.A. Ruhe: 2003, 'Perceptions of Country Corruption: Antecedents and Outcomes', *Journal of Business Ethics* **43**, 275–288.
- Den Niuewenboer, N.A. & M. Kaptein: 2007, 'Spiraling Down into Corruption: A Dynamic Analysis of the Social Identity Processes that Cause Corruption in Organizations to Grow', *Journal of Business Ethics* **83**, 133–146.
- Doris, J: 2002, *Lack of Character: Personality and Moral Behavior* (New York: Cambridge University Press).
- Efendi, J., A. Srivastava and E.P. Swanson, E.P.: 2007, 'Why do corporate managers misstate financial statements? The role of option compensation and other factors', *Journal of Financial Economics* **85**, 667–708.
- Emmons, R.: 1981. 'Relationship between narcissism and sensation seeking', *Psychological Reports* **48** (1), 247–250.
- Erev, I., T.S. Wallsten & D.V. Budescu: 1994, 'Simultaneous over- and underconfidence: The role of error in judgment processes', *Psychological Review* **101**, 519–528.
- Fama, E.: 1980, 'Agency problems and the theory of the firm', *Journal of Political Economy* **88**, 288–307.

- Farwell, L., and R. Wohlwend-Lloyd: 1998, 'Narcissistic processes: optimistic expectations, favorable self-evaluations, and self-enhancing attribution', *Journal of Personality* **66**, 65–83.
- Feld, L.P. and B.S. Frey: 2007, 'Tax Compliance as the Result of a Psychological Tax Contract: The Role of Incentives and Responsive Regulation', *Law & Policy* **29** (1), 102-120.
- Fogarty, T., M.I. Magnan, G. Markarian and S. Bohdjalian, S.: 2009, 'Inside Agency: The Rise and Fall of Nortel', *Journal of Business Ethics* **84**, 165–187.
- Forrester, J.: 1961, *Industrial dynamics* (MIT Press:Cambridge, MA).
- Freud, S.: 1957, 'On narcissism: An introduction'. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* **14**, pp. 67–104, (Hogarth Press: London).
- Getz, K.A. and Volkema, R.J.: 2001, 'Culture, Perceived Corruption and Economics: A Model of Predictors and Outcomes', *Business and Society* **40**, 7-30.
- Harman, G.: 2003, 'No Character or Personality', *Business Ethics Quarterly* **13** (1), 87-94.
- Harrison, J.R., Z. Lin, G.R. Carroll and K.M. Carley: 2007, 'Simulation Modeling in Organizational and Management Research', *Academy Of Management Review* **32** (4), 1229–1245.
- Hayward, M.L.A, V.P. Rindova and T.G. Pollock: 2004, 'Believing One's Own Press: The Causes and Consequences of CEO ego', *Strategic Management Journal* **25**, 637–653.
- Hodgson, G.M. and Jiang, S.: 2007, 'The Economics of Corruption and the Corruption of Economics: An Institutional Perspective', *Journal of Economic Issues* **61** (4), 1043-1061.

- Hofstede, G.: 1980, *Culture's Consequences: International Differences in Work Related Values* (Sage Publications, Beverly Hills, CA).
- Jensen, M. and W. Meckling: 1976, 'Theory of firm: managerial behavior, agency costs and ownership structure', *Journal of Financial Economics* **3**, 305–360.
- Kaplan, S. N.: 2008, 'Are U.S. CEOs overpaid?', *Academy of Management Perspectives* **22**(2), 5–20.
- Kets de Vries, M.: 2003, *Leaders, Fools and Impostors: Essays on the Psychology of Leadership* (revised edition) (iUniverse, New York)
- Knights, D. & M. O'Leary: 2006, 'Leadership, Ethics and Responsibility to the Other', *Journal of Business Ethics* **67**, 125-137.
- Koopman, P.L., D. N. Den Hartog, E. Konrad et al: 1999, 'National Culture and Leadership Profiles in Europe: Some Results From the GLOBE Study', *European Journal of Work and Organizational Psychology* **8** (4), 503–520.
- Kruger, J., & Dunning, D.: 1999, 'Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments', *Journal of Personality and Social Psychology* **77**, 1121-1134.
- Larrick, R. P.: 1993, 'Motivational factors in decision theories: The role of self-protection', *Psychological Bulletin* **113**, 440–450.
- Leuz, C., D. Nanda and P.D. Wysocki: 2003, 'Investor Protection and Earnings Management: An International Comparison', *Journal of Financial Economics* **69**, 505-527.
- Levinthal, D.: 1991, 'Random walks and organizational mortality', *Administrative Science Quarterly* **36**, 397–420.
- Li, J., J. Moy, K. Lam and W.L.C. Chu: 2008, 'Institutional Pillars and Corruption at the Societal Level', *Journal of Business Ethics* **83**, 327-339.

- Lomi, A., & E.R. Larsen: 1996, 'Interacting locally and evolving globally: A computational approach to the dynamics of organizational populations', *Academy of Management Journal* **39**, 1287–1321.
- MacIntyre, A.: 1991, *After Virtue* (Duckworth: London)
- March, J. G.: 1991, 'Exploration and exploitation in organizational learning', *Organization Science* **2**, 71–87.
- Matten, D. and Moon, J.: 2008, "Implicit" And "Explicit" CSR: A Conceptual Framework For A Comparative Understanding Of Corporate Social Responsibility', *Academy of Management Review* **33** (2), 404–424.
- Milgram, S.: 1974, *Obedience to Authority* (Harper Collins: New York).
- Miller, H. and K.J. Engemann: 2004, 'A Simulation Model of Intergroup Conflict', *Journal of Business Ethics* **50**, 355-367.
- Mocan, N.: 2008, 'What determines corruption? International evidence from microdata', *Economic Inquiry* **46** (4), October, 493–510.
- Morrell, K.: 2004, 'Socratic Dialogue as a Tool for Teaching Business Ethics', *Journal of Business Ethics* **53**, 383-392.
- Morris, J.A., C.M. Brotheridge and J.C. Urbanski: 2005, 'Bringing humility to leadership: Antecedents and consequences of leader humility', *Human Relations* **58**, 1323-1350.
- Morrison, A.: 2001, 'Integrity and Global Leadership', *Journal of Business Ethics* **31**, 65–76.
- Norberg, P.: 2009, 'I don't Care that People don't Like What I Do – Business Codes Viewed as Invisible or Visible Restrictions', *Journal of Business Ethics* **86**, 211-225.
- Ono, H.: 2007, 'Careers in Foreign-owned Firms in Japan', *American Sociological Review* **72**, 267-290.

- Park, H., M.T. Rehg and D. Lee: 2005, 'The Influence of Confucian Ethics and Collectivism on Whistleblowing Intentions: A Study of South Korean Public Employees', *Journal of Business Ethics* **58** (4), 387-403.
- Perel, M.: 2003, 'An Ethical Perspective on CEO Compensation', *Journal of Business Ethics* **48**, 381-391.
- Pozner, J.E.: 2008, 'Stigma and Settling Up: An Integrated Approach to the Consequences of Organizational Misconduct for Organizational Elites', *Journal of Business Ethics* **80**, 141–150.
- Reinstein, A., S.R. Moehrle and J. Reynolds-Moehrle, J.: 2006, 'Crime and punishment in the marketplace: Accountants and business executives repeating history', *Managerial Auditing Journal* **21** (4), 420-435.
- Resick, C.J., P.J. Hanges, M.W. Dickson and J.K. Mitchelson: 2006, 'A Cross-Cultural Examination of the Endorsement of Ethical Leadership', *Journal of Business Ethics* **63**, 345–359.
- Robertson, D.C.: 1993, 'Empiricism in Business Ethics: Suggested Research Directions', *Journal of Business Ethics* **12** (8), 585-599.
- Rudolph, J. and N. Reppenning: 2002, 'Disaster dynamics: Understanding the role of quantity in organizational collapse', *Administrative Science Quarterly* **47**, 1–30.
- Schwartz, H.S: 1991, 'Narcissism Project and Corporate Decay: The Case of General Motors', *Business Ethics Quarterly* **1** (3), 249-268.
- Semadeni, M., A.A. Cannella, D.R. Fraser and D.S. Lee: 2008, 'Fight or flight: managing stigma in executive careers', *Strategic Management Journal* **29**, 557–567.
- Sims, R.R. and J. Brinkmann: 2003, 'Enron Ethics (Or: Culture Matters More than Codes)', *Journal of Business Ethics* **45**, 243–256.

- Soll, J. B.: 1996, 'Determinants of overconfidence and miscalibration: The roles of random error and ecological structure', *Organizational Behavior and Human Decision Processes* **65**, 117–137.
- Solomon, R.C.: 2003, 'Victims of Circumstances? A Defense of Virtue Ethics in Business', *Business Ethics Quarterly* **13** (1), 43-62.
- Sterman, J.: 2000, *Business dynamics: Systems thinking and modeling for a complex world* (Irwin McGraw-Hill: New York).
- Street, M.D., C. Robertson and S.W. Geiger: 1997, 'Ethical Decision Making: The Effects of Escalating Commitment', *Journal of Business Ethics* **16**, 1153–1161.
- Suchman, M.C.: 1995, 'Managing Legitimacy: Strategic and Institutional Approaches', *Academy of Management Review* **20** (3), 571-610.
- Tavakoli, A.A., J.P. Keenan and B. Crnjak-Karanovic: 2003, 'Culture and Whistleblowing: An Empirical Study of Croatian and United States Managers Utilizing Hofstede's Cultural Dimensions', *Journal of Business Ethics* **43**, 49–64.
- Taylor, E.Z. and M.B. Curtis: 2010, 'An Examination of the Layers of Workplace Influences in Ethical Judgments: Whistleblowing Likelihood and Perseverance in Public Accounting', *Journal of Business Ethics* (in press)
- Treisman, D.: 2000, 'The causes of corruption: a cross-national study', *Journal of Public Economics* **76**, 399–457.
- Wagner-Tsukumoto, S.: 2005, 'An Economic Approach to Business Ethics: Moral Agency of the Firm and the Enabling and Constraining Effects of Economic Institutions and Interactions in a Market Economy', *Journal of Business Ethics* **60**, 75-89.
- Waldman, D.A., M.S. de Luque, N. Washburn, R.J. House et al: 2006, 'Cultural and leadership predictors of corporate social responsibility values of top

management: a GLOBE study of 15 countries', *Journal of International Business Studies* **37**, 823–837.

Wallace, H. M., & R.F. Baumeister: 2002, 'The performance of narcissists rises and falls with perceived opportunity for glory', *Journal of Personality and Social Psychology* **82**, 819–834.

Watson, G.W., R.E. Freeman & B. Parmar: 2007, 'Connected Moral Agency in Organizational Ethics', *Journal of Business Ethics* **81**, 323-341.

Zhang, X., K.M. Bartol, K.G. Smith, M.D. Pfarrer and D.M. Khanin: 2008, 'CEOs on the Edge: Earnings Manipulation and Stock-Based Incentive Misalignment', *Academy of Management Journal* **51** (2), 241–258.

Zyglidopoulos, S.C., P.J. Fleming and S. Rothenberg: 2009, 'Rationalization, Overcompensation and the Escalation of Corruption in Organizations', *Journal of Business Ethics* **84**, 65–73.

Table 1. Variables included in models

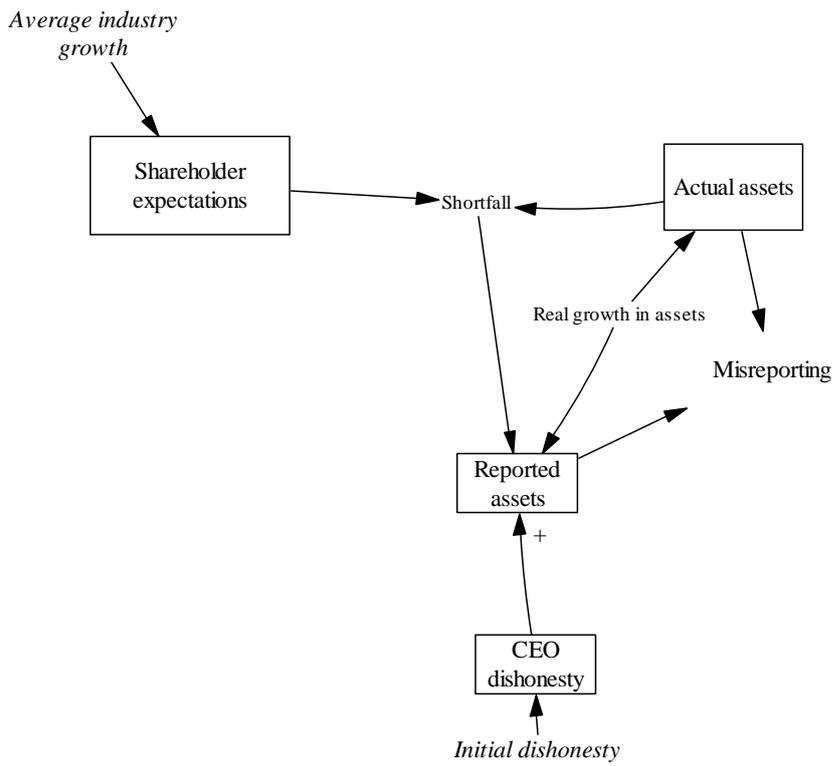
<b>Variable</b>	<b>Description</b>
Average industry growth	10% p.a.
CEO confidence	CEO's confidence set initially at 10% and increasing as 1% of annual growth in firm assets
CEO dishonesty	CEO dishonesty set initially at 50% and increasing as 1% of misreporting
Chances of discovery	Chances of fraud being discovered, which increases with the level of misreporting
Misreporting	The difference between the real and stated asset values
Penalty	Penalty for misreporting, calculated as penalty rate x misreporting x chances of discovery
Real assets	The real value of the firm's assets
Real growth	The real growth achieved by the firm (0 in year 0 and increasing by 4% p.a. each year to 20% p.a. in year 5 and thereafter)
Reported assets	The value of the firm's assets reported by the CEO, calculated as maximum of shortfall*CEO overconfidence or real growth in assets (minus penalty for misreporting where present)
Previous assets	The value of the firm's assets that is stated in accounts for the previous year
Shareholder expected assets	The value of the firm's assets expected by shareholders
Shortfall	The difference between the real and expected asset values
Whistleblowing	Constant initially set at 10%

Table 2.

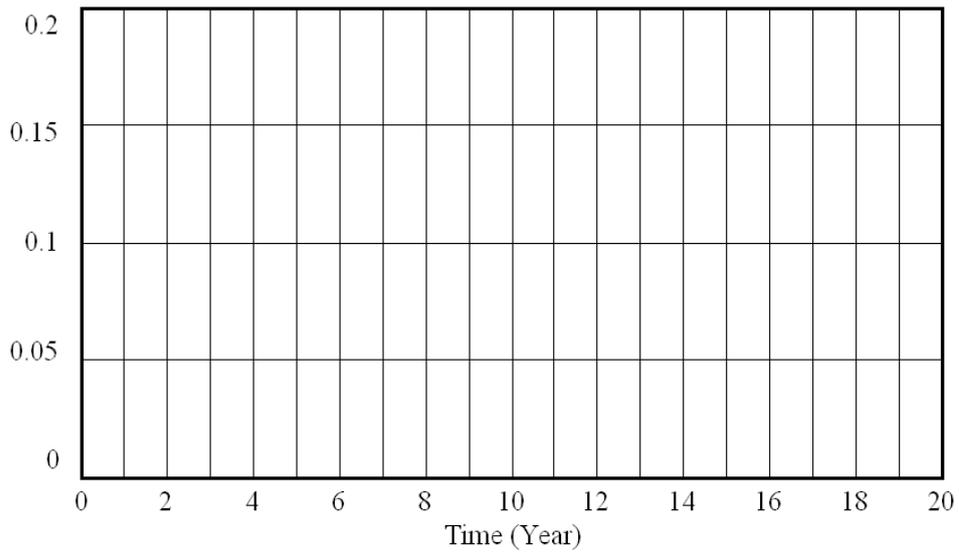
<b>Model</b>	<b>Settings of variables in model</b>	<b>Misreporting pattern</b>	<b>Maximum misreporting</b>
1: Base model	Average industry growth 10%; initial values of actual and reported assets 100; CEO dishonesty 0	No misreporting	0
2: Dishonest CEO	CEO Dishonesty 50%; Reported growth calculated as maximum of shortfall*CEO dishonesty or real growth in assets	Increases steadily from 0 in year 1 to 550 in year 6 and thereafter	550
3: Narcissistic CEO	Initial CEO confidence 10%; Reported growth calculated as maximum of shortfall*CEO confidence or real growth in assets	Slow then increasingly rapid growth in misreporting from 0 in year 1 to 2,300 in year 6 and thereafter	2,300
4: Narcissistic and dishonest CEO	Initial CEO confidence 10%; CEO dishonesty 50%; Reported growth calculated as maximum of shortfall*CEO confidence*CEO dishonesty or real growth in assets	Slow then increasingly rapid growth in misreporting from 0 in year 1 to 3,000 in year 6 and thereafter	3,000
5: Narcissistic and dishonest CEO with rising shareholder expectations	As model 4 and shareholder expectation set to maximum of industry average or last year's performance	Relatively insignificant growth in misreporting, then explosive growth in year 6	43 billion
6: Legal control	As model 5 and penalty calculated as Penalty rate *	Slow increase to 2,500 in years 6 and 7 then rapid increase	12,000

	Misreporting * chance of discovery, penalty rate 10%; CEO dishonesty 30%	to 12,000 in year 8 and thereafter	
	(b) As above and CEO dishonesty increased to 50%	Slow increase in years 1-4, increase to 2,500 in years 5 and 6 then rapid increase to 10,000 in year 7 and thereafter	10,000
	(c) As above and CEO dishonesty increased at 70%	Slow increase to year 4 then rapid increase to 12,000 in year 5 and thereafter	12,000
7: Legal control and whistleblowing	As model 6 (b) and chance of discovery increased by whistleblowing, set at 10%	Increase to 2,400 in years 6 and 7 then rapid increase to 7,000 in year 8 and thereafter	8,500
	As above and chance of discovery increased by whistleblowing, set at 50%	Increase to 2,500 in years 5 and 6 then rapid increase to 3,750 in year 7 and thereafter	3,750
	As above and chance of discovery increased by whistleblowing, set at 90%	Slow increase to year 4 then rapid increase to 2,500 in year 5 to 8 and 4,500 in year 9 and thereafter	4,500
8: CEO restraint	Confidence at 90% of value in model 5	Negligible in years 1- 5 and rapid increase in year 6	4.5 billion
9: Shareholder restraint	Shareholder expectation of above industry average performance expectation is 90% of value in model 5	Negligible in years 1- 5 and rapid increase in year 6	9.5 billion

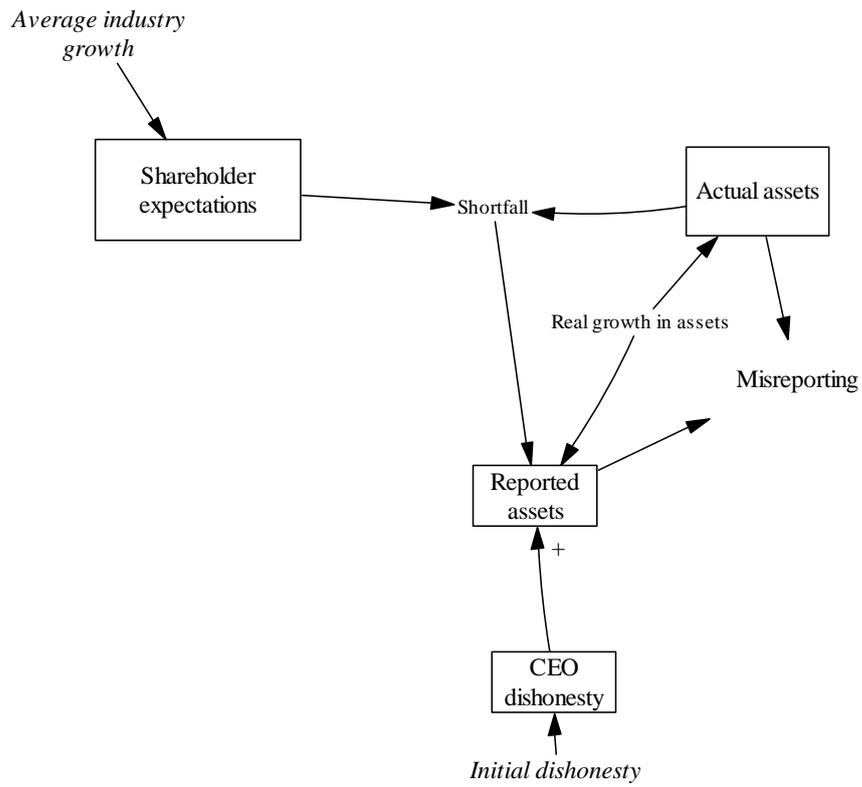
Model 1: Baseline scenario



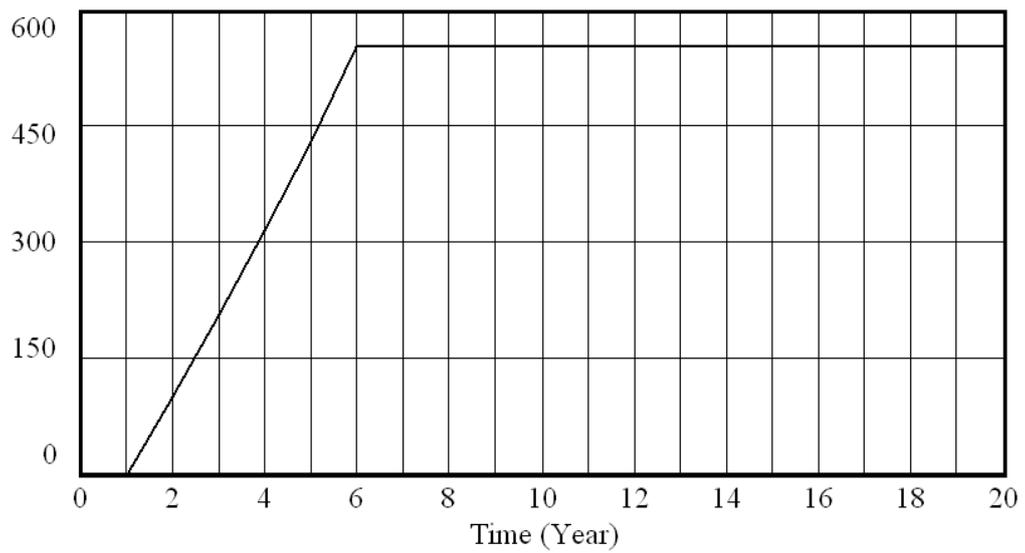
Misreporting



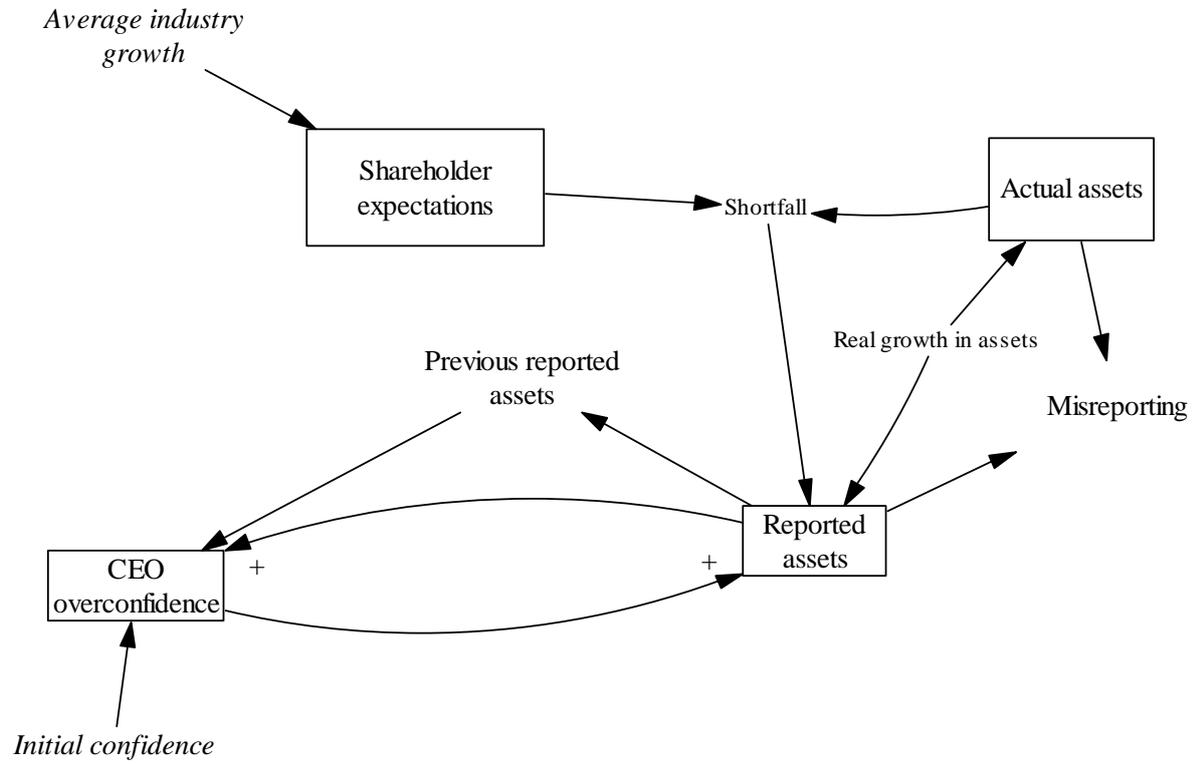
## Model 2: Dishonest CEO



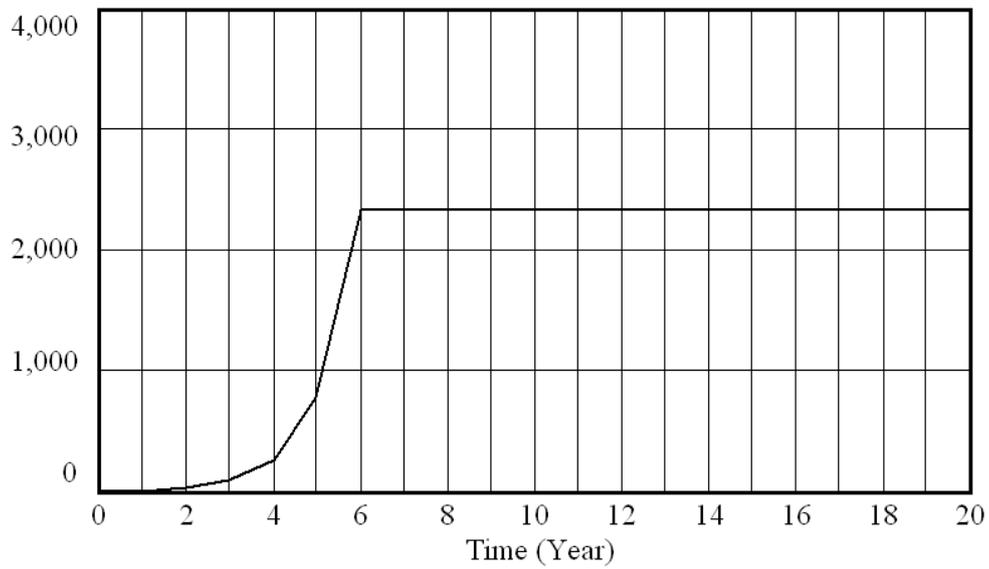
### Misreporting



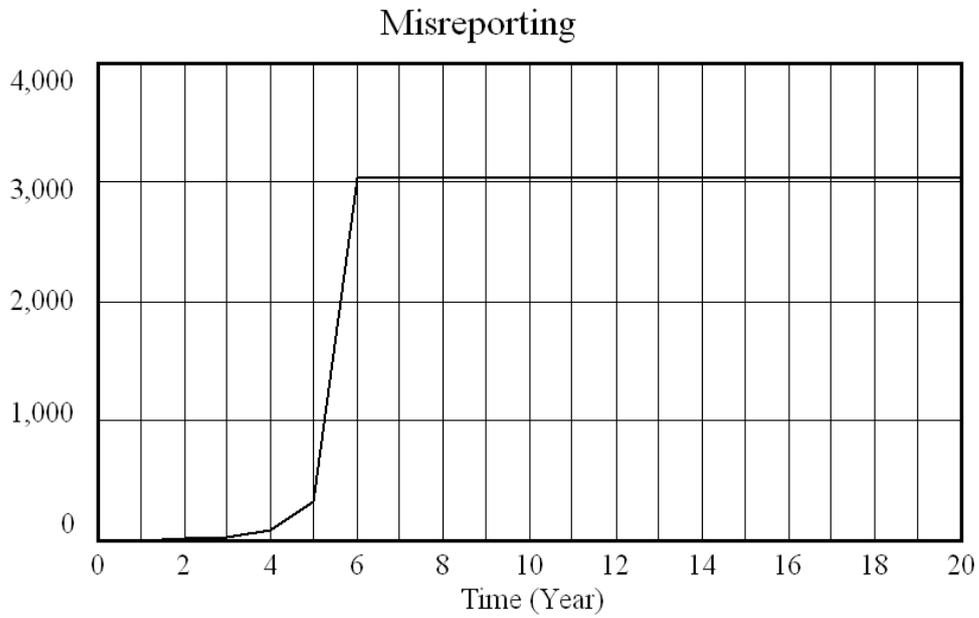
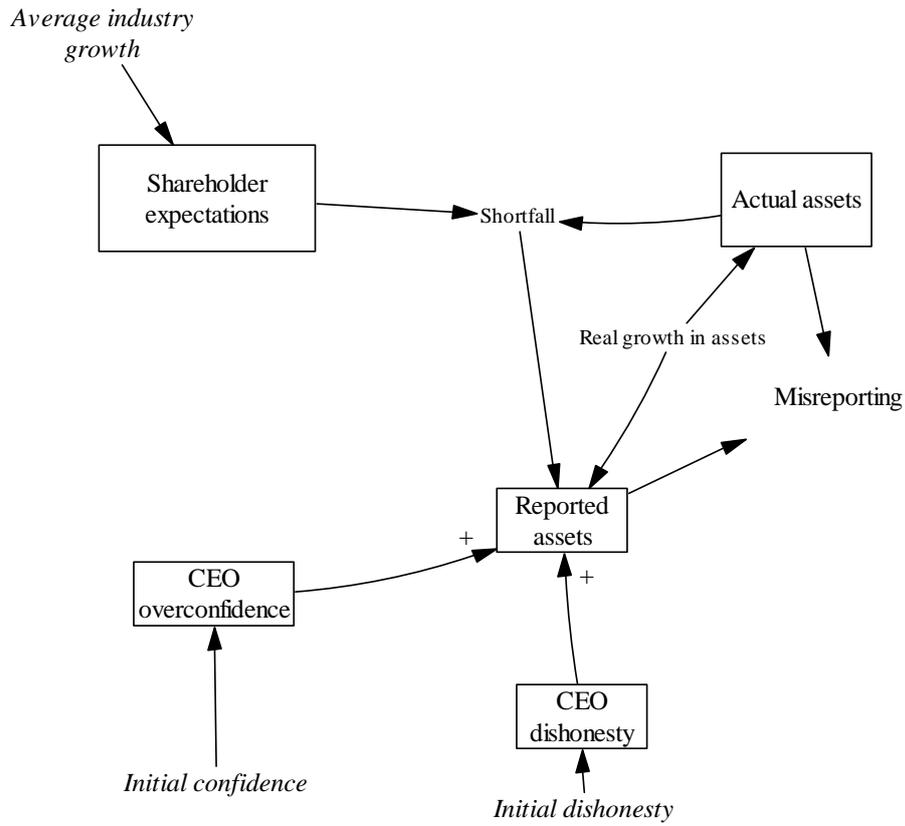
Model 3: Narcissistic CEO



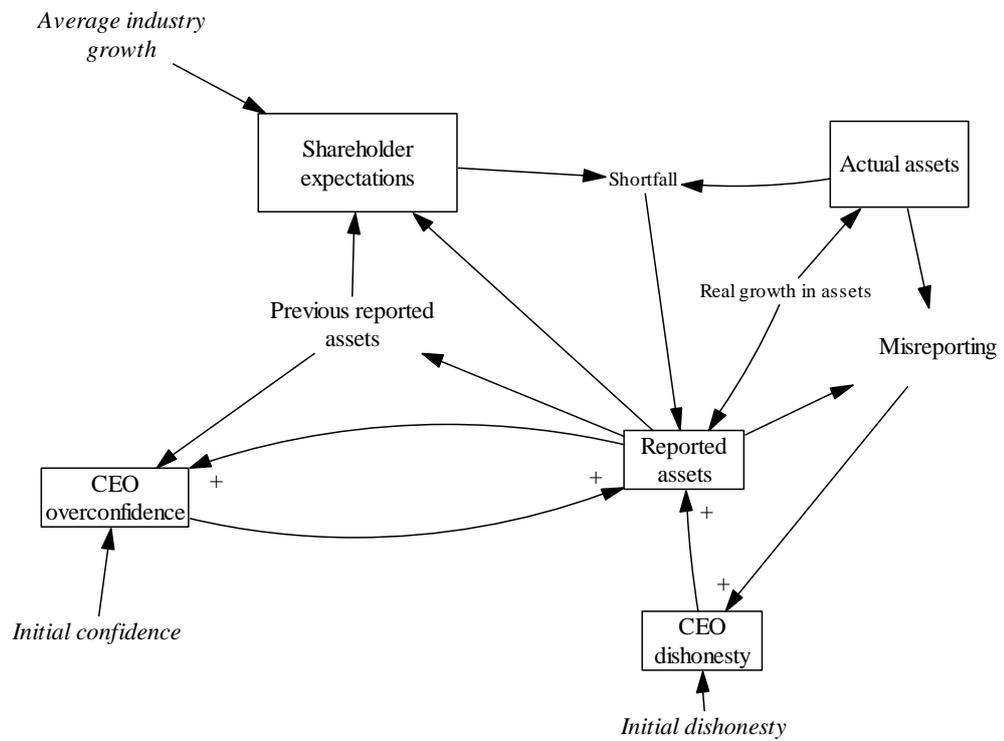
Misreporting



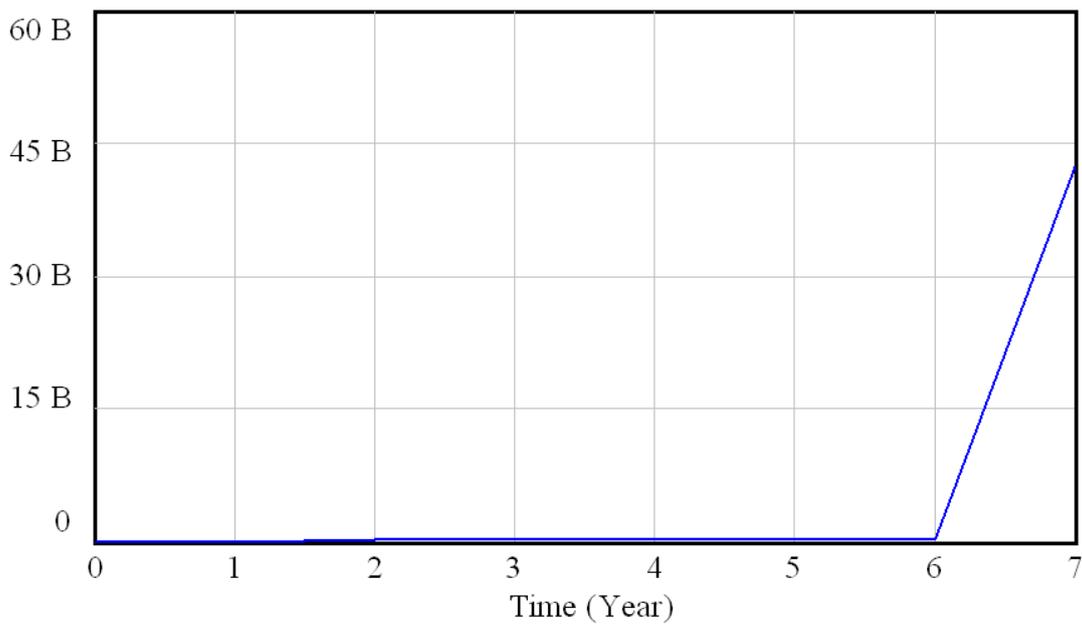
### Model 4: Narcissistic and dishonest CEO



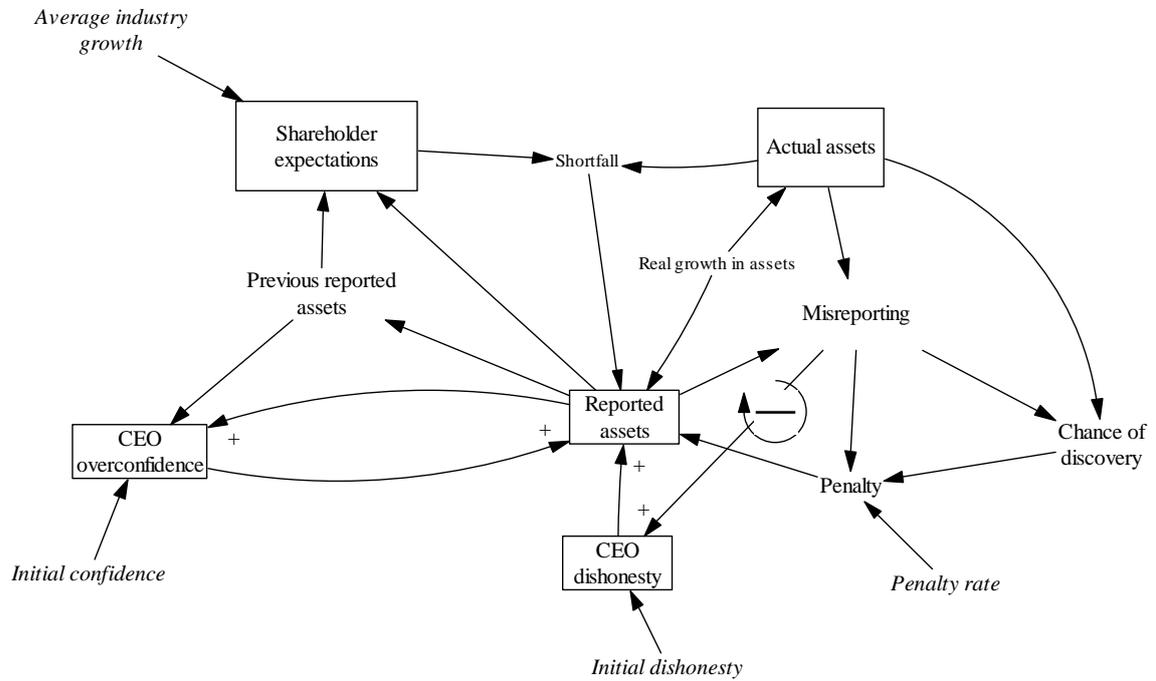
Model 5: Narcissistic, dishonest CEO and rising shareholder expectations



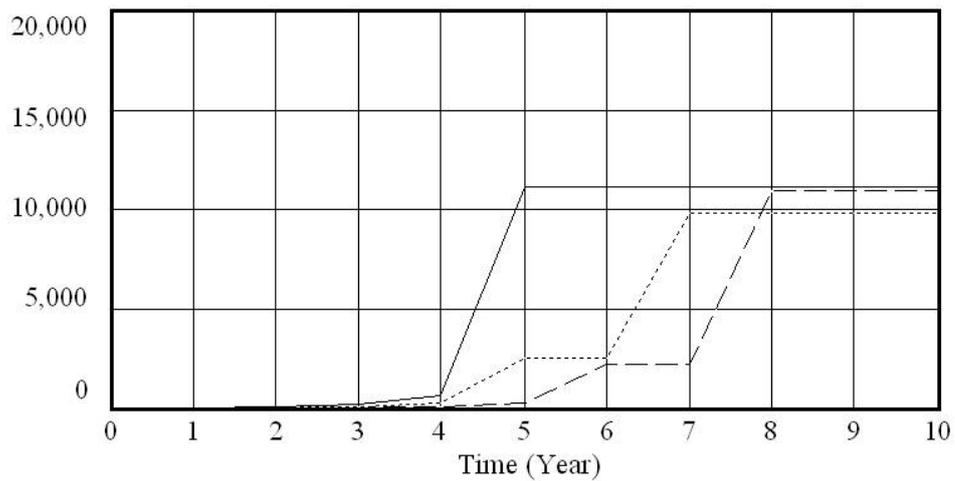
Misreporting



## Model 6: Legal control

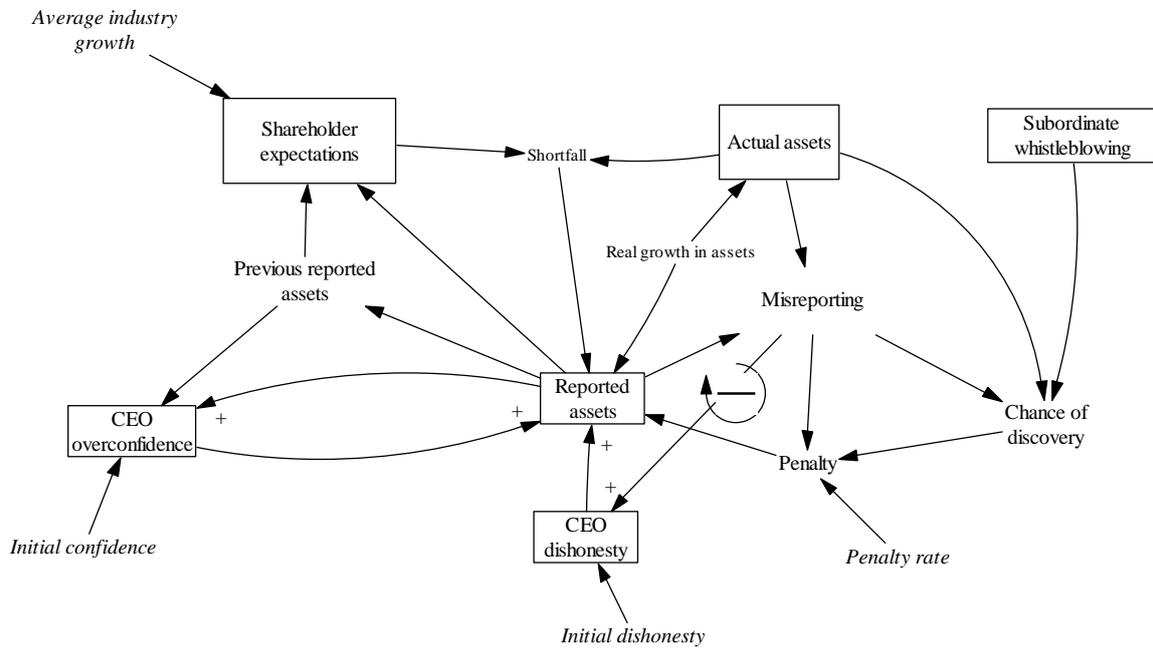


### Misreporting

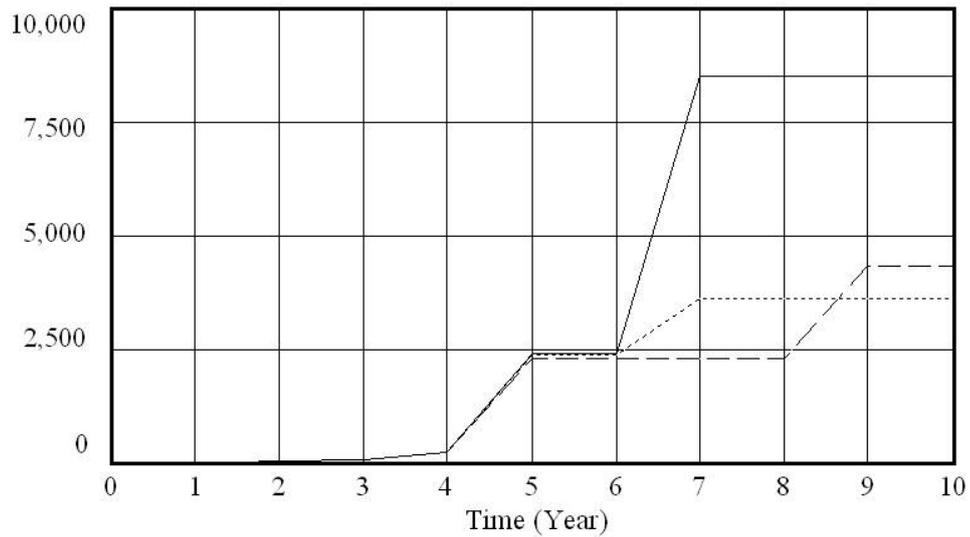


Misreporting : legal control - 70% dishonesty  
 Misreporting : legal control - 50% dishonesty  
 Misreporting : legal control - 30% dishonesty

## Model 7: Whistleblowing

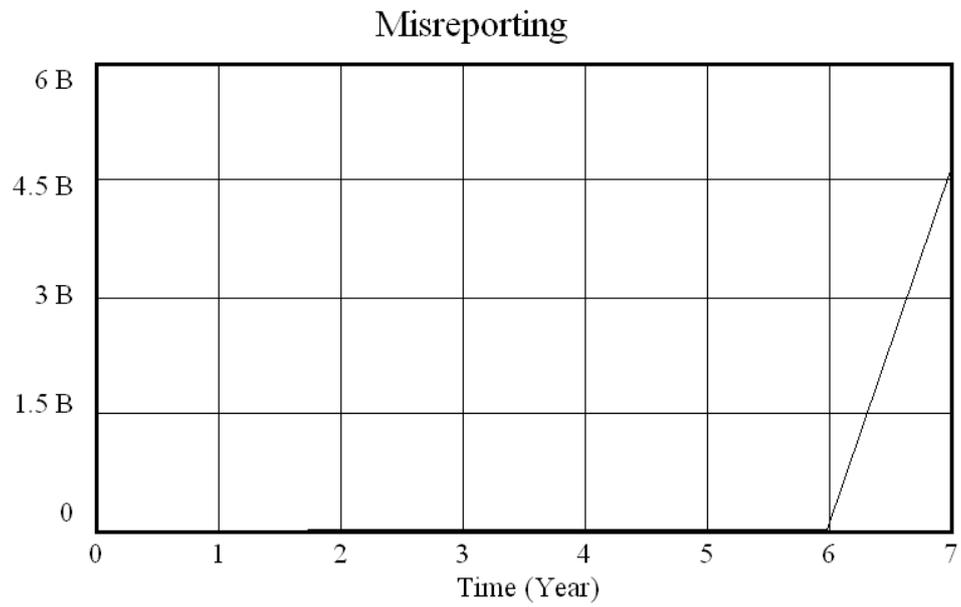


### Misreporting



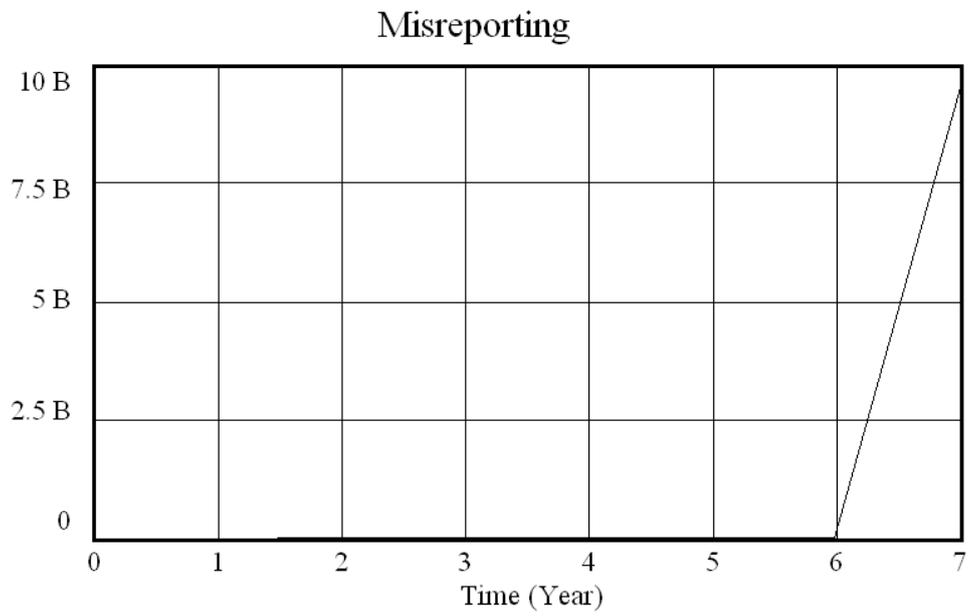
Misreporting : whistleblowing - 50% dishonesty, 10% whistleblowing  
 Misreporting : whistleblowing - 50% dishonesty, 50% whistleblowing  
 Misreporting : whistleblowing - 50% dishonesty, 90% whistleblowing

Model 8: Social constraint on CEO narcissism



Misreporting : 90% restrained confidence

Model 9: Shareholder restraint



Misreporting : restrained shareholders \_\_\_\_\_