Cycles of Corporate Fraud: A Behavioural Economics Approach

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<a>Introduction

In recent years, the corporate sector has again been rocked by managerial fraud and scandals. The standard economics (homo economicus) economics view, a la Becker (1973), is that criminal (and fraudulent) behaviour is driven by fully rational agents, who perform a very calculative and mathematical cost-benefit analysis (CBA) of crime/fraud commission: weighing up, in a very rational unemotional manner, the economic/monetary benefits of the crime/fraud commission, and the expected costs (the probability of being caught multiplied by the economic penalties if caught). This approach emphasises that rigorous monitoring (by watchdogs such as auditors, independent directors, and regulators), coupled with strong punishment threats towards miscreants, can be effective in deterring corporate crime and fraud.

In contrast, the more recent paradigm of behavioural economics combines standard economics, psychology and sociology to recognise that real-world humans are not always fully rational, unemotional, non-psychological all-calculating maximisers of expected utility (Simon, 1957; Janis, 1972; Tversky and Kahneman, 1974; Kahneman and Tversky, 1979; Thaler, 1980, 2015; Loewenstein, 1996; Rabin, 2002). The behavioural economics (homo sapiens) approach examines the effects of including bounded rationality, psychology, and emotions into the economics models, and into the agents' preferences. Particularly in relation to corporate crime and fraud, behavioural economists have cast doubt on Becker's fully rational, unemotional, non-psychological CBA approach. Real-world criminals may be myopic (the immediate benefits of the crime are salient: the long term expected costs are too far in the future to be considered). In this chapter, motivated by Dan Ariely's research into crime, we add to the behavioural economics approach to consider a deeper, psychoanalytical, Freudian approach to crim- and fraud-commission. Indeed, Ariely (2008) argues that emotions often play a key role in the decision to commit crime: criminals often gain emotional excitement at 'getting away' with the perfect crime.

The purpose of this chapter is four-fold. First, we consider the theoretical and empirical research from the behavioural economics perspective of crime, with a focus on corporate fraud. Second, we analyse, in detail, some of the (behavioural and psycho-analytical) game theoretic approaches to corporate fraud: this is both interesting in terms of the modelling approaches, and what they reveal to us about real-world factors affecting corporate fraud. Third, we apply the behavioural economics/psychoanalytical framework to real-world cases. Fourth, we consider real-world policy implications arising from the behavioural economics approach. Finally, we discuss most recent research into corporate fraud, and conclude.

1.   <a>Behavioural Economics and the Slippery Slope to Fraud

Behavioural and psychoanalytical game theoretic approaches emphasise that two particular phenomena may lead to managerial fraud in the corporate sector: a) the tendency for fraud to start on a small scale, perceived by perpetrators as insignificant and inconsequential, but which may 'mount up' over time to large cumulative fraud, and b) formerly ethical managers becoming 'infected' by the behaviour of unethical managers within an organisation.

In this chapter, we consider a simple framework in which a manager commits a series of small frauds over time (initially perceived as insignificant). At some critical point the frauds accumulate to a magnitude where they 'activate' the manager's super-ego. At that point, guilt looms large, which may be sufficient to motivate the manager to cease his fraudulent behaviour, and to admit to previous indiscretions. However, if regret dominates, the manager may be 'entrapped' into continuing to further hide fraud. In a second version of the model, we consider an organisation consisting of two managers: one ethical/non-fraudulent and one unethical/fraudulent. We consider how the unethical manager's behaviour may 'infect' the ethical manager, so that the latter is induced to commit fraud, due to the unethical culture of the organisation.

We employ our theoretical analysis to help to understand a real-world fraud case (Enron) in which fraud began at small individualistic levels, but quickly escalated and

became institutionalized throughout the organization, destroying the company. We conclude with policy and ethical implications, and suggestions for future research.

Setting the Scene

There is no shortage of recent episodes of destructive managerial fraudulent behaviour and egregious activity. Prominent cases at the firm level (for example, Enron, Parmalat, Xerox, Tyco, American International Group (AIG), Lehman Brothers, Satyam, amongst many others), and at the individual level ('rogue traders' such as Nick Leeson at Barings Bank, Jerome Kerviel at Societe Generale, Kweku Adoboli at UBS, and John Rusnak at AIB), repeatedly brought the issue of corporate fraud to public attention.

Given the prominence of such high-profile fraud cases, there have been increasing demands for tougher corporate regulation, stronger governance and monitoring (e.g. by corporate boards), and more stringent reporting and accounting standards (e.g. SOX (2002) in the USA, the EU's Audit Directive (2014), and numerous updates to the UK's governance and auditing framework – FRC, 2016). A common feature of such tougher financial regulations is that they aim to deter fraud and other undesired managerial behaviour through yet more stringent monitoring and harsher economic penalties. However, it must be questioned just how effective tougher regulations and punishments are in deterring fraud given that corporate fraud continued seemingly unabated after the introduction of similar measures in the past.

The debate over the efficacy of addressing corporate fraud through tough governance, regulation and punishment threats is important both from an academic and practitioner perspective. Insights into this debate are provided by considering the traditional rational economics framework (the rational choice model, in which agents are fully rational, unemotional, unbiassed, perfect all-calculating maximisers of expected utility: the homo economicus approach), compared with the behavioural economics framework (which incorporates psychology, bounded rationality and emotions into the decision-making model: the real-world homo sapiens approach).

We consider the behavioural economics/psychoanalytical approach to corporate fraud. This approach enables us to consider the economic and behavioural factors affecting

managerial corporate fraud. The approach provides important insights into the following questions. Why are managers (as human beings) susceptible to fraudulent activity? Why do some managers engage in such behaviour, while others are able to resist it? Is it easy for managers to face-up to their misdoings, and 'come clean'? Or is there a form of 'fraud-entrapment' with a 'slippery slope', particularly when the manager has committed a series of small frauds over time, which may result in a large cumulative amount of fraud? Are some humans naturally more prone to fraud than others, or are fraudulent managers products of the culture and environment within their organisations (the classic 'nature' versus 'nurture' debate)?

A further question for scholars to consider is whether managerial fraud is primarily the result of an economic, cost-benefit analysis, type decision, or are there also behavioural/psychological/emotional factors at play? This final question is particularly important, and relevant to the debate over whether tough regulations and punishment threats are likely to be effective in deterring managerial corporate fraud.

Corporate Fraud: Economic Versus Behavioural Factors

How effective can tough financial regulation and strong punishment threats be at deterring corporate fraud? In this chapter, we consider a behavioural game-theoretic framework of managerial fraud, incorporating both a dynamic aspect (current managerial fraud activity may be affected by past, accumulated, misdemeanours over time: thus, managers at the individual level may become entrapped into fraudulent activity), and an organisational/cultural/environmental aspect (such that ethical managers may be dominated and induced into fraud by the existence of unethical managers and an organizational culture which nurtures unethical behaviour: consider, for example, the culture of fraud at Enron, and its remuneration and promotion system which encouraged fraud).

The seminal work on the economics of crime was developed by Becker (1974). He considers criminal activity occurring as a result of a fully rational cost-benefit analysis. That is, he considered criminals who weigh up the benefits of the crime (for example, how much money will they be able to steal?) against the costs of the crime (the cost of effort of committing it, the probability of being caught, the extent of the

punishment if they are caught, and so forth). Hence, according to Becker, criminals are fully rational, all-calculating, unemotional, self-interested, maximisers of expected utility. Becker's approach implies that tough financial regulation and strong punishment threats can be effective at deterring corporate fraud.

We have been motivated by two main departures from Becker's (1974) economic calculus of criminal (fraudulent/unethical) activity. Discussing the psychological/psychoanalytical underpinnings of fraud at the individual level, Ariely (2008) suggests:

> "Sigmund Freud explained it this way. As we grow up in society, we internalise the social virtues. This internalisation leads to the development of the superego. In general, the superego is pleased when we comply with society's ethics, and unhappy when we don't."

Ariely notes that, according to this Freudian framework, the Superego provides us with the warm-glow that comes from charitable, other-regarding and ethical acts, such as returning a lost wallet to its owner. However, given the existence of a super-ego, and our resulting desire to be honest, why are criminal activity and fraud so widespread? According to Ariely, the super-ego is only active (helping, monitoring and managing our honesty) when we are engaged in large transgressions. For small crimes or frauds, Ariely argues that the Super-ego stays asleep, and we do not consider how these small crimes reflect on our honesty. The crimes are simply too small to activate the super-ego. There may come a point in the process where, after committing a series of small frauds, the manager suddenly realises the cumulative extent of those frauds, and the super-ego awakes. At this point in time, the manager may then own up to past misdemeanours, or become entrapped in fraud, due to regret.[1]

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[1] The pioneers of regret theory were Loomes and Sugden (1982), and Bell (1982). These authors developed economic models incorporating the emotion of regret, and, in particular, the potential for humans to exhibit *regret aversion*. In our fraud model, we are appealing to their idea, based on psychological evidence, that individuals are able to anticipate the regret that they will feel from a bad decision, or bad outcome. Furthermore, according to regret theory, individuals are able to delay feeling regret by postponing the actualisation of the bad outcome. In our model, when the superego awakes, the manager realises the regret that he will feel due to the cumulative fraud that he has committed, but

<b>Slippery slope to fraud - Competing Forces Model of Crime

Our framework is close in spirit to the analysis of Van Winden and Ash (2012). These authors analyse the behavioural economics of crime, and develop a "Competing Forces" model of criminal/fraudulent behaviour. As they point out, current crime-deterrence policies (from governments, law-makers, regulators, and other organisations) suffer from being based on Becker's (1974) standard economics approach, in which criminals conduct a fully rational cost-benefit (CBA) analysis of crime-commission. Becker' approach emphasises strong punishment threats as an effective deterrence: the behavioural economics approach calls this finding into question.

We build on, the behavioural economics model of Van Winden and Ash (2012). Their "Competing Forces" model incorporates rationality, cognitive biases, and emotions. They analyse people as being "boundedly rational, being motivated by emotions as well as cognition. Analytically, this approach conceptualises criminal behaviour (B) as the product of a dual process of cognition (C) and emotion (E)"

Interestingly, Van Winden and Ash consider a linear "action space" of criminality, ranging from zero (minimum criminality) to 1 (maximum criminality level). Then, "We conceptualise the criminal's cognitive and emotional decision systems as generators of force-fields in the action space.... (the model) can be used to show the action tendencies or forces on behaviour at a given level of x".

Their model provides a useful means of considering when cognitive and emotional forces act in the same direction, or opposite directions, to push the criminal to more or less crime. We will demonstrate parallels in our behavioural /psychoanalytical model: we, too, consider an action space for fraud (the manager can commit fraud each period in an interval from zero to a maximum amount). Further, we consider cases where there are competing cognitive and emotional forces "pushing" the manager in one direction or the other (towards maximum or minimum fraud).

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is able to postpone that by continuing to hide it. He anticipates that, once the fraud is discovered, his regret will 'flood his consciousness.'

Motivated by the model of Van Winden and Ash (2012), we note the following departures in our approach:

a) We focus on conscious and unconscious emotions in a psychoanalytical framework (considering a human's super-ego, which may be asleep for small frauds, or awake for larger frauds), and the interaction between these emotions and a rational cost-benefit analysis.

b) We incorporate the emotions of regret, guilt, pride. Our approach implies a dual-selves model.

c) We introduce the effect of managerial fraud-hiding efforts, and we consider the possibility of managerial entrapment into fraud (neither of which are included in the model of Van Winden and Ash: 2012).

Our analysis of managerial entrapment into fraud has parallels with the work in behavioural corporate finance of Statman and Caldwell (1987), who incorporate regret theory, and regret aversion, into a prospect theory framework to understand managerial entrapment into a failing corporate project, thus refusing to abandon it. The losing project induces the manager to be risk-seeking (prospect theory: people are risk-seeking when facing losses), and regret aversion further cements this entrapment, as the manager postpones the pain of revealing (to the market and to himself) that he made a mistake in investing in a bad project. In our model, we can think of the manager being entrapped into fraud, and continuing to hide it to postpone the painful regret of revealing his fraud.

The second point of departure for our analysis has been motivated by the work of Kulik et al. (2008), who analyse the effect of organisational group culture on the spread of unethical practice throughout the organisation. Particularly, they consider how a culture that rewards unethical behaviour may result in the spread of unethical behaviour from unethical to ethical managers. After developing their conceptual framework, Kulik et al. (2008) apply it to the case of Enron, with its stacking system

for managerial promotion/firing which effectively rewarded and motivated unethical behaviour.[2]

Our analysis considers how the Freudian psychoanalytical framework, with the existence of a superego, can explain how managers may fall onto the 'slippery slope' to fraud, and may become entrapped in fraud, due to emotions such as regret. In a similar vein, Schrand and Zechman (2011) consider how the behavioural factor of managerial *overconfidence* may result in this slippery slope to fraud. These authors empirically analyse How overconfident executives with an optimism bias initially and unintentionally overstate earnings. In subsequent periods, when the executives become aware of their financial mis-reporting, they may then become entrapped into intentional mis-statement to cover it up. Our formal analysis could explain Schrand and Zechman's conceptual framework, and their results: in the initial period, the super-ego is asleep: at a critical point, the super-ego awakens, and the manager may then be entrapped in deliberate mis-statement.

Fleming and Zyglidopoulos (2007) present a *process* model that analyses the escalation of deception in organizations. Similar to our analysis, they consider how once-ethical organizations ("Enron, WorldCom, Arthur Andersen and Lucent, did not start out deceitful") can become involved in a process of fraud-escalation and entrapment ("If undetected, an initial lie can begin a process whereby the ease, severity and pervasiveness of deception increases overtime so that it eventually becomes an organizational level phenomenon."), noting that their paper contributes to "a growing body of research that looks beyond 'bad' individuals for the causes of corporate illegality." This emphasises the importance of the 'nature versus nurture' debate, and sets the scene our analysis, inspired by Kulik et al. (2008), that ethical managers may be 'infected' by an unethical culture.[3]

The seemingly frequent recurrence of scandals may point to potentially inadequate or inappropriate legislative responses, which gives rise to the question whether more

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[2] Trinkaus and Giacalone (2005) present an interesting analysis of the spread of unethical behaviour across a broader set of stakeholders (beyond internal management) in Enron: specifically, they consider why the external watchdogs (such as institutional investors, and external auditors) were not 'barking': ie were acquiescing in the widespread fraud.

[3] Indeed, Sims and Brinkmann (2003) argue that Enron's collapse was driven by its culture, and the authors argue that "Culture matters more than codes."

fundamental issues are being overlooked. In a review of a series of frauds, and legislative responses, that occurred throughout the twentieth century, Rockness and Rockness (2005) for example, focus on purely economic reasons for managerial fraudulent behavior. Following Becker's (1974) analysis, these authors argue that "The incentives for management to engage in unethical practices were driven by personal gain, ego and greed illustrated by opportunistic and exploitative executive behavior to achieve personal objectives…. The use of incentive-based compensation schemes provided the incentives… for fraudulent financial reporting".

In contrast, findings from cognitive psychology and behavioural studies suggest that decision-making is not exclusively based on logical reasoning, but is also subject to numerous heuristics and cognitive biases (Tversky and Kahneman, 1974; Kahneman and Tversky, 1979; Fischhoff, 2002), affect (Slovic et al., 2002, 2004), visceral factors (Schelling, 1984; Loewenstein, 1996; Loewenstein and Lerner, 2003), and pressures towards conformity with the group or authority (Asch, 1951; Janis, 1972). Divergence from utility maximization over time adds a temporal dimension to this literature (Strotz, 1955; Thaler, 1981; Laibson, 1997). Cohan (2002) considers corporate governance failings at Enron in terms of information blockage and information myopia. He analyses how these effects may have been driven by a combination of factors: economic (e.g. deliberate concealment of information by officers: "only telling the boss what one perceives the boss wants to hear"), behavioural (e.g. bounded rationality, cognitive dissonance, confirmatory bias, group-think, false-consensus effect), and unconscious emotions.

2.   Game Theory, Corporate Governance and Ethics

Our approach employs a game-theoretic analysis to consider the economic and behavioural factors affecting managerial fraud in organisations such as Enron. Other game-theoretic approaches exist that analyse various aspects of corporate governance and ethics. For example, in a series of papers, Sacconi (1999, 2006, 2007) develops a conceptual, philosophical and game-theoretic analysis of a social contract approach (which considers all stakeholders) to understanding ethical behaviour in an organisation. Cast in the new institutional theory of the firm framework, Sacconi's contractarian approach focuses on unethical behaviour regarding the abuse of

authority, and the effects of contracts necessarily being incomplete, due to ex-post uncertainty and unforeseen circumstances that cannot be fully understood or described in the ex-ante initial contract. In Sacconi's papers, this ex-post uncertainty can be mitigated in the initial contract by appealing to "fuzzy logic" and "fuzzy set" theory. In practical terms, this approach argues for loose, principles-based contracts, rather than strict rules-based contracts. Furthermore, Sacconi argues that the social contract can be considered, in practical terms, as a firm's code of ethics.

In addition to arguing for a principles-based 'fuzzy' social contract, Sacconi's series of papers gradually develop the 'story' along the following lines. First, he considers the optimum framework for the initial social contract. Sacconi (2006) argues that the contract should be ex-ante acceptable to all parties, and hence *implementable*. The way that Sacconi deals with this is as follows. The social contract is based on economic bargaining models, particularly Nash bargaining over the expected economic surplus generated from the organisational relationship. This bargaining is structured in such a way to ensure fairness and impartiality: hence all parties are happy to sign it, and it is indeed implementable.

In Sacconi (2007), he argues that ex-ante implementability is one thing: however, ex-post compliance is quite another. Why should parties adhere to the initial agreement as the situation unfolds? This speaks directly to the ex-post abuse of authority. Sacconi (2007) argues that such ex-post opportunism can be mitigated by long-run and dynamic reputation effects, and he considers a repeated Prisoner's Dilemma game in which reputation drives compliance and mutual cooperation.

Sacconi's work is based on a homo economicus approach, in which the players are self-interested, fully-rational, unemotional, non-psychological, unbiased maximisers of expected utility. Hence, compliance has to be individually rational, and is enforced by fear of damaged future reputation if agents defect from the agreement (the 'shadow of the future' in repeated prisoner dilemma terminology).[4] Furthermore, it is assumed

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[4] We do not focus on the reputation-damaging/ economic punishment threat mechanism for enforcing ethical compliance/non-abuse of authority in our present paper. Instead, we focus on the latter issue: control of unethical behaviour by the super-ego, and the 'bounded rationality' of managers when committing small frauds, such that the super-ego remains asleep. In a future paper, we will work on developing Sacconi's work to consider whether players may comply to the Social Contract due to

that agents, being fully rational, can calculate, and can fully comprehend, the extent of the effects of their defection.

In our model, we consider homo sapiens, not homo economicus. The manager in our analysis is capable of feeling emotions, may be psychologically biased: particularly, we consider a psycho-analytical approach, in which a manager's ethicality is governed by his super-ego, not by external economic factors, such as reputation. In our dynamic model, the manager may not be able to 'look ahead' rationally (unlike in Sacconi's approach), since his super-ego may be asleep for small frauds. Sacconi's rational economics approach may be considered in terms of standard economics and standard game-theory: our approach, on the other hand, may be considered as falling into the realm of behavioural economics and behavioural game theory. Comparing our approach with Sacconi's is useful for considering real-world fraud cases, such as Enron. The Enron case demonstrates that the fully rational homo economicus approach may not be appropriate of sufficient in real-world fraud cases: fraud and abuse of authority can arise and spread in an organisation through psychological, behavioural and emotional channels.

Another game-theoretic approach has been developed by Cosimano (2004). He employs a repeated Prisoner's dilemma framework, with punishment threat, to analyse why tier 1 financial institutions failed to carry out their fiduciary duties in auditing, monitoring and controlling Enron. Cosimano's approach is heavily based on the economic approach in which fully rational self-interested utility-maximising agents act opportunistically unless constrained by future punishment threats. Hence, Cosimano argues for strong contracts, legal codes and punishment. We argue, supported by our behavioural game-theoretic analysis, that policy-makers need to understand both the economic and the behavioural/psychological factors affecting fraud-commission and fraud-entrapment.

The model

We consider corporate fraud both at the individual and corporate network level. In our first analysis, we focus on the economic, behavioural and psychological factors

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social preferences (fairness, trust, empathy) in a one-shot game, rather than the punishment threat in a repeated game.

affecting individual managerial fraudulent behaviour, and the role of the superego in fraud entrapment, abstracting from any environmental and organisational effects. In our second analysis in our paper, we incorporates environmental, contextual and organisational effects by considering 'fraud-infection' across the dyad.

Model 1: Single Manager

We begin by considering a behavioural model that analyses managerial fraudulent behaviour at an individual level. We consider a manager who has the opportunity to commit fraud in each period of his firm's existence. Particularly, we focus on a manager who initially considers fraud on a period-by-period (myopic) basis, and considers fraud as small and inconsequential. Each period, there is a probability that the fraud is discovered (by, for example, external stakeholders, such as auditors, regulators, investors, the general public). Since the manager views this fraud as small and inconsequential, he underestimates his utility-loss in terms of lost reputation and financial punishment. During this period of the game, the manager focuses on an *economic* cost-benefit analysis of fraud-commission. However, at a critical period, the manager is 'hit' with the realisation that each period's small fraud has 'mounted up' to a large cumulative fraud. This activates his 'superego', which is capable of considering behavioural feelings of guilt and regret. Hence, the manager now conducts a *behavioural* cost-benefit analysis of fraud commission.

We model this game formally as follows. During the first time-period from period 1 to a critical period n_C, the manager's super-ego remains asleep. At the critical period n_C, the manager's super-ego awakes. In each period, the unethical manager makes two decisions: a) how much fraud to commit, and then b) how much effort to exert in hiding the fraud. We solve each period's optimal decision-making 'backwards': that is, in each period, we solve for the manager's optimal fraud-hiding efforts, given the fraud level, and then move back to determine his optimal fraud-level in that period. We denote fraud in period n as f_n, and we assume that there is a maximum level of fraud $\bar{f}$ that he can commit each period. We denote his fraud-hiding effort as e. Effort is costly for the manager: his cost-of-effort function is βe^2. This exhibits increasing marginal cost of effort.

Each period, there is an exogenously-given probability $q \in [0,1]$ that the manager's fraudulent activity will be discovered (by external stakeholders, such as the company's auditor, the regulator, the investors, the general public). We assume that, if any level of fraud is discovered, the organisation collapses (as in the Enron case), and the manager suffers a huge economic (lost job, lost reputation, lost future employment elsewhere) and behavioural/emotional/psychological (guilt, regret) utility loss. He may also suffer legal punishment/imprisonment (which has huge economic and behavioural/emotional/psychological costs).

In order to solve the game, we need to specify a payoff function for the period in which the super-ego is asleep, and for the period when the super-ego awakes. When the super-ego is asleep, the manager's expected payoff in each period $n \in [1, n_C)$ is:

$$\Pi_n = (1-q)f_n + q[f_n(1-(1-\gamma e)\hat{r})] - \beta e^2 \qquad (1)$$

The first term represents the manager's expected payoff in the case that fraud is not discovered. f_n represents the level of fraud that the manager commits in period n (one of the manager's two decisions each period). The first term captures the idea that the unethical manager gains positive utility from committing fraud. If the fraud is not discovered (which happens with probability $1-q$), this utility is undiminished. The second term represents the manager's payoff in the case that fraud is discovered (which occurs with probability q). In that case, the manager's payoff from committing fraud is diminished by his *perception of* lost reputation $\hat{r}$ from being discovered as fraudulent. γ represents his fraud-hiding ability: recall that e is his fraud-hiding effort. Thus, the higher is the product of his ability and effort γe, the more fraud he is able to hide in the case that fraud is discovered. For example, if $\gamma e = 0$, he does not hide any fraud: if fraud is discovered, he suffers 'full-utility loss': $f_n(1-\hat{r})$. As γe increases, his utility loss due to perceived loss of reputation reduces. At the maximum level of $\gamma e = 1$, the manager suffers no utility loss when fraud is discovered: $f_n(1-(1-\gamma e)\hat{r})$ becomes f_n. The final term in equation (1) is the manager's cost of fraud-hiding effort.

In equation (1), we are modelling the idea that, when the super-ego is asleep, the manager only considers fraud in the current period: he ignores/writes-off previous fraud: he does not consider cumulative fraud: he focusses on current period fraud. This reflects the idea that he considers fraud as 'small and inconsequential'.

Furthermore, in the period when the super-ego is asleep, he focuses on an *economic* cost-benefit analysis: thus, he considers the economic cost of lost reputation. Furthermore, he considers his *perception* of lost reputation. We assume that he underestimates this factor: the true lost reputation is $R > \hat{r}$. Note that the true lost reputation will appear in payoff (2) below, when the manager's super-ego awakes.

We solve for the manager's optimal (that is, payoff maximising) fraud-level and fraud-hiding efforts in the period of the dormant super-ego 'backwards': that is, we first take as given the manager's choice of fraud level in period n, and find his optimal effort level by solving $\dfrac{\partial \Pi_n}{\partial e} = 0$ in equation (1). We then substitute that optimal effort level into equation (1), and solve $\dfrac{\partial \Pi_n}{\partial f_n}$. Under certain parameter assumptions, we obtain the following.

Lemma 1: *In the period when the super-ego is asleep:* $n \in [1, n_C)$,

   a) *The unethical manager only considers fraud in each period (ignoring previous cumulative fraud): Therefore, he views fraud as small and inconsequential, and he commits maximum fraud per period:* $f_n = \bar{f}$.

   b) *The unethical manager exerts fraud-hiding effort* $e* = \dfrac{q\bar{f}\gamma\hat{r}}{2\beta}$.

Therefore, M's fraud-hiding effort is positively related to the probability of fraud-discovery, the level of (maximum) fraud in period n, his ability to hide fraud, and his perceived lost reputation from being discovered. Note that he underestimates the true lost reputation from fraud-discovery, so he undersupplies fraud-hiding effort (that is,

if he understood the true level of lost reputation, he would work harder to hide fraud). His fraud-hiding effort is negatively related to his effort-cost of hiding fraud.

Before considering the period where the super-ego awakes, it is worth considering one of our assumptions in more detail. We have assumed that, if fraud is discovered, the organisation collapses, the manager loses his job, and the game ends. However, above, we have modelled the business-as-usual case, where the game continues for the full term of the dormant super-ego, with the manager committing the same maximum fraud, and fraud-hiding efforts as in result 1, identically for each of the periods $n \in [1, n_C)$. Of course, as the game continues through this time interval, the probability of fraud-discovery by outsiders, such as the auditor, increases. In our model, the probability of *avoiding* fraud discovery by the time we arrive at period n is $(1-q)^n$.

Our modelling approach is based on the firm continuing. One way is to consider a very low probability of fraud-discovery. As an example, if we assumed that the probability of fraud-discovery is $q = 0.1$, (10% chance of being discovered/90% chance of getting away with it each period!) then the probability of avoiding fraud discovery by the time we arrive at period 5 is $0.9^5 = 0.59$. Even to survive fraud-investigations to period 10 has quite a high probability: $0.9^{10} = 0.35$. Our model then focuses on the case where the firm avoids fraud discovery for a sufficiently long period to make our model meaningful.

We now turn to considering the critical time period n_C where the super-ego awakes. We consider that the super-ego awakes when the 'small and inconsequential' period-frauds mount up to a large level of cumulative fraud that triggers the super-ego. Thus, we define a critical level of cumulative fraud F_C, where, if $F \in [0, F_C)$, the manager's superego is dormant. If we reach period F_C without fraud being discovered (see discussion above), the superego awakes.

In result 1 above, we demonstrated that, when the super-ego was asleep, the manager exerted the same level of fraud each period, being the maximum physical amount per

period $\bar{f}$. Therefore, the critical level of fraud F_C, at which the superego is awakened, can be translated into a critical time period $N_C = \dfrac{F_C}{\bar{f}}$. To clarify analysis, we assume that $\bar{f}$ divides into F_C exactly, so that, at N_C, cumulative fraud has reached the exact level of critical fraud (this is not an essential assumption, but it makes the analysis neater and clearer).

Thus, when we reach period n_C, cumulative fraud is such that the super-ego awakens. We specify the unethical manager's payoff, when the super-ego awakens, as follows:

$$\textstyle\prod = (1-q)(F_C[1-G]) + qF_C(1 - \gamma eG - (1-\gamma e)(R+r)) - \beta e^2. \tag{2}$$

We designed this payoff to capture the various conflicting economic and behavioural/psychological/emotional factors in the fraudulent manager's mind when the super-ego awakens, and he realises the extent and level of his cumulative fraud. The reader is invited to compare payoff (2) with earlier payoff (1) when the super-ego was asleep: we observe parallels in these two payoffs.

When the super-ego was asleep, the manager only considers period fraud (thus f_n in payoff (1)). Now that the super-ego is awake, he considers cumulative fraud F_C in equation 2. As in equation (1), the unethical manager gains some positive utility from fraud-commission (Ariely (2010) discusses how criminals and fraudsters may gain some pleasure and excitement from 'committing the perfect crime', cheating the system and getting away with it![5]): but now, in equation (2), the positive utility comes from cumulative, not period fraud.

As in equation 1, the payoff in equation 2 captures both the case where fraud is not discovered (with exogenous probability $1-q$), and the case where fraud is discovered (with exogenous probability q). The first term of equation (2) demonstrates that when

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[5] See, for example, Ariel's (2010) Blog: "How to Commit the Perfect Crime." At
http://danariely.com/2010/06/05/how-to-commit-the-perfect-crime/

the super-ego awakes, then, if fraud is not discovered, the manager enjoys the excitement of committing cumulative fraud (F_C). However, compared to equation (1) when the super-ego was asleep, the manager now feels a level of guilt, acting as a psychological 'cost' on utility: $(1-G)$. Note that G is a fraction between zero and 1, and represents the proportion of the utility from F_C 'lost' due to painful feelings of guilt.

The second term in equation (2) represents the case where the fraud is discovered. In our model, the manager's fraud-hiding effort e reduces the amount of fraud to be discovered: effectively, the harder that he works at hiding fraud, the more fraud that he can put out-of-sight of external bodies, such as the auditor. For example, in the Enron case, much managerial effort was exerted in creating complex accounting methods and financial instruments, such as SPEs, to hide large levels of fraud from the external auditor.

In the second term of payoff 2, R represents his true lost reputation when his fraud is discovered. We focus on the case where $R > \hat{r}$ (that is, the manager underestimated his lost reputation when considering small frauds in equation 1, but now realises the true extent R of his lost reputation if the cumulative fraud is now discovered). Furthermore, in the second term, r represents managerial regret from committing fraud after it is discovered. As noted earlier in the paper, this follows the behavioural research into regret theory (Bell 1982; Loomes and Sugden 1982) which suggests that people only feel regret when the loss becomes 'real'. Also, as noted previously, the manager only feels guilt G if fraud is not discovered.

In our model, the manager has no control over the probability q of fraud-discovery (for example, the manager cannot 'make' the auditor discover fraud: if the auditor lacks independence, and wishes to 'turn a blind eye', or exerts low effort into finding fraud, the manager cannot make the auditor discover fraud).[6] Thus, when considering

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[6] We emphasise that, in our current analysis, we do not consider the auditor as a player in the game. The probability of fraud-discovery q is exogenously given, but may implicitly capture our discussion on the reasons why the probability of fraud-discovery is beyond the manager's control, such as the psychological motivations of the auditor herself. Many papers exist, considering a game-theoretic approach in which a manager and an auditor are both players in the game. See Anastasopoulos and

his *expected* payoff, he faces two possible guilt-situations: in the first case, he feels guilt when fraud is not discovered (the first term of equation 2): in the second case, he feels guilt when fraud is discovered, but he has hidden some away (e.g.: in SPEs): this is captured in the second term of equation 2.

The second term in payoff 2 captures an interesting trade-off for the unethical manager when the super-ego is awake. The manager feels guilt *G* for the amount of fraud hidden away (being discovered and 'coming clean' is 'good for the soul'). On the other hand, the manager suffers both from lost reputation and from regret due to the amount of fraud discovered. The manager thus faces an interesting trade-off and economic/psychological conflict in his mind when deciding on his fraud-hiding efforts: as he increases his fraud-hiding efforts, he gains in terms of reducing the negative effects of lost reputation and regret. However, he increases the utility-loss associated with guilt. These two opposing effects are interesting. Lost reputation and regret drives the manager to work harder to hide fraud, while guilt drives him to work *less* hard to hide fraud: his optimal fraud-hiding effort depends on which of these two effects dominate. Result 2 captures this trade-off in the manager's fraud-decision.

We solve for the manager's optimal fraud level and fraud-hiding efforts exactly as described when deriving result 1. We obtain proposition 1: (which incorporates lemma 1 to give the complete picture). Note that proposition 1b), that the manager reduces period fraud to zero, depends on certain parameter assumptions.

Proposition 1:

a) When $N \in [0, N_C)$, *the super-ego lies dormant. The manager only considers period-fraud. He commits the maximum 'small' fraud each period:* $f_n = \bar{f}$, *and exerts fraud-hiding efforts* $e* = \dfrac{q\bar{f}\gamma\hat{r}}{2\beta}$.

b) When $N > N_C$, *the super-ego is activated, and the manager experiences feelings of guilt and regret. Furthermore, he now turns his attention to cumulative fraud. The manager reduces his period- fraud to zero. Although he*

commits   no   more   fraud,   he   exerts   fraud-hiding   efforts

$e* = \max(\dfrac{qF_C\gamma[R+r-G]}{2\beta},0)$ *(in order to hide the existing cumulative fraud).*

When his guilt is low compared to lost reputation and regret: $G < R + r,$ *the manager exerts some fraud hiding efforts. When his guilt is high compared to lost reputation and regret:* $G \geq R + r,$ *he reduces his fraud-hiding efforts to zero.*

We summarise these results in figures 16.1 and 16.2:

Figure 16.1 About Here

Figure 16.2 About Here

In figure 16.1, the thinner lines represent per period fraud. The thick black lines represent cumulative fraud. In summary, the manager uses a cost-benefit calculation (as in Ariely's discussion). Up to time $n_C = \dfrac{F_C}{\bar{f}}$, he views the frauds as small, his guilt is low, and therefore, he commits fraud. After time $n_C = \dfrac{F_C}{\bar{f}}$, fraud becomes large enough that his superego kicks in, activating guilt, such that he stops fraud.

Figure 16.2 captures an interesting effect: although the manager stops committing fraud, his fraud-hiding efforts are determined by his relative feelings of guilt and regret, together with his lost reputation. If guilt dominates, then he reduces his fraud-hiding efforts to zero. If lost reputation/regret dominates, he *increases* his fraud-hiding efforts (as he now considers cumulative, rather than period fraud). This can be considered as a kind of fraud-entrapment. In the early periods, he perceived the fraud as minor, and so committed it without guilt, and exerted low fraud-hiding efforts. In the latter periods, he views the cumulative fraud as large, and is now entrapped into hiding it.

<b>A dyadic model of fraud-infection

Thus far, we have considered an individual manager, acting in isolation. We now extend the model to consider the possibility that unethical practice (such as fraud) may spread throughout an organisation, as unethical actors 'infect' ethical actors. In this work, we have been inspired by Kulik et al.'s (2008) conceptual model of the spread of unethical behaviour. Following the second part of Kulik et al.'s model, we focus on a dyadic relationship between two types of manager: an ethical (non-fraudulent) and unethical (fraudulent) manager. We note a difference between the two managerial types that has important policy and ethical considerations. The unethical manager acts exactly as in model 1, as described in results 1 and 2. That is, he performs a cost-benefit analysis, with the super-ego asleep for the first n_C periods (purely economic cost-benefit analysis), after which the super-ego awakes (economic and behavioural cost-benefit analysis). In performing these calculations, the unethical manager considers the probability of fraud-discovery. In contrast, the ethical manager does not perform such a cost-benefit analysis, and does not consider the probability of being caught. In our model, the ethical manager acts according to his character (is it in his character to commit fraud?), but may also be affected by the organisational culture.

We model this as follows. The unethical manager still faces the payoff as in (1), and acts as in the first model, as described in results 1 and 2. The ethical manager, on the other hand, is a different 'beast' and has the following payoff:

$$\Pi_E = U - gf_n + \psi \tag{3}$$

where U represents the ethical manager's 'base utility' from working in the organisation, and gf_n represents his guilt (parameter g) from committing period fraud f_n. Due to the multiplicative nature of this element of his payoff, g can be thought of as 'guilt per unit of fraud'. Thus, the higher is g, and/or the higher is f_n, the higher the total guilt felt by the ethical manager. We assume that g is strictly positive for the ethical manager; thus, in the absence of the final parameter ψ of

equation (3), payoff $\prod_E$ is strictly decreasing in guilt. That is, an ethical manager would optimally choose zero fraud to maximise his payoff.

It is the final parameter of equation (3), ψ, that brings the interest to our dyadic model. We term ψ the unethical infection parameter, and it provides the link from the unethical manager's to the ethical manager's behaviour, as follows.
We model unethical infection as:

$$\psi = \theta\Delta(n-1) \quad \text{if } f_n(E) = f_n(U)$$
$$\psi = 0 \qquad\qquad \text{if } f_n(E) < f_n(U). \qquad\qquad\qquad (4)$$

The first part of equation (4) states that the ethical manager only gains utility ψ if he 'matches' the unethical manager's level of fraud: $f_n(E) = f_n(U)$. If he commits any level of fraud lower than the unethical manager, $f_n(E) < f_n(U)$, then the ethical manager gains zero utility from unethical infection: $\psi = 0$.

θ is the unethical infection rate: that is, the extent to which unethicality spreads across an organisation from unethical to ethical members. Δ is the 'organisational reward' for being unethical. Thus, for example, in Enron, we would expect both parameters to be large: much research demonstrates that Enron was organised such that both the infection rate, and the rewards for being unethical, were large in Enron. Breaking down the total level of unethical infection to these two factors (infection rate, and organisational rewards for unethical behaviour) may be interesting for empirical analysis of fraud across organisations, as we suggest that both elements play a role in the spread of fraud. The factor $(n-1)$ is in the equation to represent the growing pressure on the ethical manager to commit fraud as time goes on.

In our dyadic model, the actions of the unethical manager remain as in model 1 (that is, he is isolated from the behaviour of the ethical manager). Thus, the unethical manager continues to commit maximum fraud in the period when the super-ego remains asleep: $N \in [1, N_C)$. Thus, given that the unethical manager commits

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maximum fraud per period, then (4) demonstrates that the ethical manager only achieves $\psi = \theta\Delta(n-1)$ if he mimics the unethical manager by committing maximum fraud in the period. If he commits any amount of fraud lower than the maximum per-period level, he will commit less fraud than the unethical manager, and his unethical reward, from (4) will be $\psi = 0$. Formally, incorporating (4) into (3), the ethical manager's payoff, when he commits less-than-maximum per-period fraud (given that the unethical manager is committing maximum fraud in each period) is:

$$\Pi_E = U - gf_n. \tag{5}$$

On the other hand, if the ethical manager mimics the unethical manager by committing maximum per-period fraud, the ethical manager's payoff is:

$$\Pi_E = U - gf_n + \theta\Delta(n-1). \tag{6}$$

Considering (5) and (6), the ethical manager's payoff is decreasing in fraud in (5) (that is, for any level of fraud up to, but just less than, the maximum level). If the ethical manager commits maximum fraud, then his payoff jumps up by the final term in (6).

Therefore, from (5) and (6), the ethical manager either commits zero fraud, or maximum fraud. Thus, (5), with zero fraud, becomes:

$$\Pi_E = U \tag{5a}$$

In order to decide on his optimal level of fraud (zero or maximum), he simply compares (5a) and (6), to observe which is larger. This reduces to the following result. The ethical manager commits maximum fraud in a period if $\theta\Delta(n-1) > gf_n$; otherwise, he commits zero fraud. We note the following. In the first period ($n=1$), the ethical manager faces zero unethical infection: $\psi = \theta\Delta(n-1) = 0$. Thus, (5a) > (6), and he commits zero fraud. Now, throughout the period when the super-ego is asleep, such that the unethical manager commits maximum per-period fraud, the ethical manager's unethical infection pressure is growing with the passing periods, due to the

inclusion of $n-1$ in the infection equation. The ethical manager switches from zero fraud to maximum fraud in the period where equation (6) switches from being less than, to becoming greater than (5a). Note that (5a) = (6) when $\theta\Delta(n-1) = gf_n =>$

$$(n-1)' = \frac{gf_n}{\theta\Delta}. \tag{7}$$

Thus, $(n-1)'$ represents the critical period whereby, for $n-1 < (n-1)'$, the ethical manager commits zero fraud. When $n-1 \geq (n-1)'$, the ethical manager switches dramatically from zero to maximum fraud. Payoff (6) captures the following dilemma for the ethical manager: The second term demonstrates that he feels guilt at committing fraud (this is what defines him as an ethical manager, in contrast to the unethical manager, with dormant super-ego). However, he faces organisational pressure, from the infection rate, and from the organisational rewards from mimicking the unethical manager. This ethical dilemma is captured further in (7): the more ethical he is (higher numerator in 7), the later the critical period at which he switches from zero to maximum fraud to mimic the unethical manager. On the other hand, the higher the organisational unethical infection pressure (the denominator in (7), the *earlier* the period at which he switches from zero to maximum per-period fraud.

We note that, given the parameter values in (7), and given the exogenous period N_C at which the unethical manager's superego awakes, it is possible that the ethical manager is able to resist the unethical infection parameter for the entire period that the unethical manager's super-ego is dormant (this is the case where $n' > N_C$). On the other hand, if $n' \in [0, N_C)$, the ethical manager will be able to resist, and commit zero fraud for the period $n \in [0, n')$, but will switch to maximum per-period fraud when $n \in [n', N_C]$. In order to clarify this analysis, we work with the following numerical parameter values: $U = 1,000$; $g = 5$; $f_n = 500$; and the infection parameters are $\theta = 0.5$; $\Delta = 1000$. For the unethical manager, we consider the case where his superego awakes at the cumulative fraud level: $\overline{F} = 5,000$. Since the maximum per-period fraud is $f_n = 500$, this implies that the critical period at which the unethical

manager's super-ego awakens is,: $n_C = \dfrac{\overline{F}}{f_n} = 10.$ Consider the ethical manager.

Given the parameter values above, we compare (5a) (zero fraud) and (6) (maximum fraud) to examine the ethical manager's behaviour in each round.

<b>Ethical Manager's Fraud decision as a function of time

Figure 16.3 summarises the ethical manager's fraud decision period-by-period.

Figure 16.3 About Here

The horizontal line is his payoff from committing zero fraud (5a). The upward sloping line is his payoff from committing maximum fraud (payoff 6). The figure demonstrates that he switches from zero to maximum fraud at period 6. We can easily check that this is consistent with the critical period in (7):

$$(n-1)' = \frac{gf_n}{\theta\Delta} = \frac{5*500}{0.5*1000} = 5. \ \Rightarrow n' = 6.$$

3.1: The unethical manager's super-ego awakes

We assume the following. If the ethical manager is able to resist committing fraud for the entire period where the unethical manager's superego is dormant (that is, $n' > N_C$,) then, when the unethical manager's super-ego awakes, and he behaves as in result 1, the ethical manager remains ethical (i.e. remains uninfected), and continues to ignore the behaviour of the unethical manager, continuing to commit zero fraud. On the other hand, if $n' < N_C$, the ethical manager switches to maximum fraud during the period where the unethical manager's superego is dormant. In this case, we assume that, once the unethical manager's superego awakes, the ethical manager has become so infected by the unethical manager, that, he, in effect, becomes an unethical manager, and acts as in result 1. Both managers (ethical and unethical) stop committing fraud, but may or may not exert fraud-hiding efforts for the cumulative fraud, depending on whether $G < R + \hat{r}$ or $G > R + \hat{r}.$

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This has interesting organisational implications. In the former case, where $n' > N_C$. there is only one level of cumulative fraud, committed by the unethical manager. In the latter case, $n' < N_C$, the ethical manager becomes infected (doubling the level of organisational fraud in the periods when he becomes infected), and equally as entrapped as the unethical manager when the superego awakes. In the case that $G < R + \hat{r}$, they both exert cumulative fraud-hiding efforts once the superego awakes.

In figure 16.4, we consider the case where $N_C = 10$. Given our parameter values above, we obtained $n' = 6$. Thus, in figure 16.4, we are considering the case where $n' < N_C$, such that the unethical manager commits maximum per-period fraud of $f_n = 500$ each period, and the ethical manager commits zero fraud up to $n = n' = 6$, but becomes infected at that period, and jumps to maximum fraud for the remaining 4 periods $n \in [n' = 7, N_C = 10]$. When the super-ego awakes at $N_C = 10$, both managers (ethical and unethical) stop committing fraud. Thus, in periods 1-6, the per-period fraud is 500 (committed only by the unethical manager). In periods 7-10, the per-period fraud is 1000 (committed by both managers). Thus, when the unethical manager's super-ego awakes, the cumulative fraud level is 6*500 + 4*1000 = 7,000. At this point, they both stop committing fraud. However, if $G < R + \hat{r}$, both managers become entrapped into exerting fraud-hiding efforts.

Figure 16.4 About Here

The unethical manager's super-ego is asleep for the first 10 periods, and so the unethical manager commits the maximum amount of fraud per period ($f_n = 500$). The ethical manager commits zero fraud per-period until period $n' = 6$. At this point, the infection parameter dominates, and the ethical manager switches from zero to maximum period-fraud of 500, mimicking the unethical manager. Hence, the period fraud doubles from 500 to 1000 (unethicality has 'swept across the dyad'): hence, the kink in the figure at period 6. At period 10, the super-ego awakes, and both managers stop committing fraud at the cumulative level of 7000 (although, depending on the economic and behavioural parameters in their payoffs, they may continue to hide it:

recall result 2). Although we have only considered a dyad, we could develop this work to consider a network of managers across the organisation. What our dyadic analysis has demonstrated is that unethicality may gradually spread across managers over time, and that total fraud may then 'snowball', increasing at an ever-greater rate.

3.   <a>Real World Unethical Infection: The Enron Case

In this section, we follow up our theoretical analysis by considering the case of Enron. Enron provides an example where fraud and unsustainable business practices appear to have become endemic with a promotion system in place which effectively encouraged unethical behaviour. As noted by Kulik et al (2008), Enron nurtured an organizational culture in which unethical managers were rewarded for performance even if this involved committing a fraud, and where ethical managers were incentivised to copy this behaviour.

Although the extent and scale of the *ex post* investigation of the collapse of Enron was unprecedented, the most accessible studies are still those emanating from the internal enquiry set up by Enron shortly after the commencement of the SEC investigation (the Powers report: Powers et al., 2002) and the monumental enquiries of the bankruptcy examiners (Batson, 2002, 2003a,b,c; Goldin, 2003).[7] The Powers report focuses primarily on the scale of Enron's off balance sheet activities, transactions between Enron and its unconsolidated Special Purpose Entities (SPEs), the use of transactions with these SPEs to seek to protect Enron's reported profitability in the two years immediately ahead of its collapse, and the opportunity for improper personal benefit afforded to certain of Enron's senior executives from such transactions.

The bankruptcy examiners' reports gives a wider perspective on the extent and manner of the manipulation of Enron's financial reporting in terms of income, cash flows and the balance sheet picture. The great majority of these manipulations were, individually, designed to comply with US GAAP and the details of the transactions giving rise to the manipulations were known to the auditors. However the bankruptcy examiner's (Batson) view was that, in a great many cases, the compliance with US

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[7] There is also an extensive academic literature reviewing and interpreting aspects of the Enron saga – examples of which include Benston et al. (2003) and Benston (2006).

GAAP was illusory and that overall the combined effect was a massive distortion of the financial statements. Details of this distortion which, in the opinion of the bankruptcy examiner, led to overstatement of profit by 96%, of operating cash flows by 105% and an understatement of liabilities by 116% in the final set of fully audited financial statements, those for the year end 31 December 2000 (Batson, 2003a).

On the face of it, Enron's corporate governance structure was a model of good practice. Enron's Audit and Compliance Committee, chaired by Robert Jaedicke Emeritus Professor of Accounting and former Dean of the Graduate School of Business at Stanford, and including Wendy Gramm, a former chair of the US Commodity Futures Trading Commission, and Lord Wakeham both a qualified accountant and a previous UK energy minister, was a distinguished one. The external audit was carried out by Arthur Andersen, one of the then Big Five auditors. There was an active risk and compliance function internal to the firm. Enron had produced a Code of Ethics, a document of 64 pages signed by Kenneth Lay (Enron CEO and Chairman), outlining the company's firm commitment to conducting business affairs in accordance with all applicable law and in the highest moral and honest manner, with the last known edition produced in July 2000 (now an exhibit in the Smithsonian's National Museum of American History). The only potential reservation would be that the internal audit function was outsourced to Andersen, the external auditors, a practice which is prohibited in the United States since implementation of the Sarbanes Oxley Act of 2002, and in the European Union since implementation of the 2014 Regulation regarding statutory audit of public-interest entities.[8]

It is arguable whether anything could have prevented the collapse of Enron subsequent to the initial revelations of financial irregularities. Nonetheless, a more effective corporate governance structure, effective internal control, an effective risk management system, and a committed risk committee, might have been able to check management excesses in terms of remuneration and might have both reduced the scale

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[8] The ability to purchase both external and internal audit from the same firm has been a source of controversy for some time and the SEC had brought into force rules (probably unworkable) limiting the extent to which clients could purchase internal audit from their external auditor. Post Sarbanes-Oxley there is now a complete prohibition of joint purchase. The 2014 EU Regulation (Regulation (EU) No 537/2014) prohibits a number of Non-Audit Services that can be provided by the external auditor, see: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.158.01.0077.01.ENG.

of the loss, the spread of the fraudulent behaviours, and significantly affected where the losses fell by ensuring more appropriate financial reporting practices and the prevention of schemes whereby net cash outflows were incurred for the purpose of financial reporting manipulation.

In addition to the documented unquestionably poor financial reporting, the sub-standard auditing provided by Arthur Andersen, and the failures of effectively all of the standard corporate governance mechanisms right up to the company's demise, we question how an organization's behaviour, and with this we make reference to what one must assume to be a majority of key personnel, including the members of the Board who are the basis for the 'tone at the top', came to wholeheartedly embrace a myriad of inopportune, in many instances unethical, and regularly unlawful, business practices, which on the whole and in their final impact would seem to have resulted in its unexpectedly sudden and inglorious demise. Here, the case contributes to an understanding of the antecedents to and the spread of unethical behaviour, its spread across the organization, and its development into the de-facto norm.

Kulik et al. (2008) note the corrosive effects on ethical behaviour of forced competition systems in organizations. Enron's stacking system implemented a strict system of intra-organizational competition amongst employees, and refers to a forced-ranking system which forced out low performers every six months. Alas, forced ranking systems may not only be ineffective and inefficient (Pfeffer and Sutton, 2006), but may foster the spread of unethical behaviour between individuals after the behaviour has emerged but before unethical behaviour had become normalised. Kulik et al. (2008) argue that such systems may result in organization-wide corruption as an unintended consequence, an interpretation that had earlier been suggested by Pfeffer and Sutton (2006), quoting McKinsey consultants Michaels et al. (2001):

> "A couple of years ago, one of us gave a speech at a renowned (but declining) high-technology firm that used a forced-ranking system. They called it a stacking system. Managers were required to rank 20 percent of employees as A players, 70 percent as Bs, and 10 percent as Cs. Just as The War for Talent advises, they gave the lion's share of rewards to As, modest rewards to Bs, and fired the

Cs. But in an anonymous poll, the firm's top 100 or so executives were asked which company practices made it difficult to turn knowledge into action. The stacking system was voted as the worst culprit. This is not just one company's experience. A survey of more than 200 human resource professionals…found that…more than half of the companies [surveyed] used forced ranking (p. 107)."

Losers in a stacking system are under pressure to adopt the behaviours of the winners at the dyadic (person to person) level in order to thrive and survive in organisations. This can then lead to the spread of unethical behaviour if the winners at least sometimes succeed by making unethical decisions and the losers adapt to the behaviour of the winners (Kulik et al., 2008). With regard to the effects on behaviour, established behaviour patterns (including what may originally be seen as corrupt, fraudulent, unethical or unacceptable behaviour) may subsequently be interpreted as the acceptable norm, without necessarily being interpreted as 'improper'.

Enron's stacking system likely induced behaviour which in hindsight is clearly inappropriate, unethical, even fraudulent, but at the time may largely have been viewed as acceptable behaviour necessary to survive and succeed in a highly competitive environment. Hence, competitive, aggressive, unethical behaviour may become acceptable, indeed highly valued and rewarded, leading to highly selective perceptions of acceptable behaviour, regardless of and in contrast to Enron's professed core values, summarized in Enron's four values of respect, integrity, communication, excellence ('R.I.C.E.') and its Code of Ethics, values which in reality were routinely violated and undermined. A stacking system, and the rewards from perceived dominant behaviours and outcomes this enabled and encouraged, may well reinforce biases in judgement and decision making processes noted elsewhere, such as a susceptibility of individuals to drift from accepted or prescribed behavioural norms (Maccoby, 2000); the tendency to acquiesce to or uncritically accept assertions (Prentice, 2000a, 2000b; Langevoort, 2001; Coffee, 2001); and, socio-psychological effects on the quality of judgements and decision-making of groups (Janis, 1989).

Committing small transgressions to start with, and 'blanking' them in the mind as "too small to worry about", "acceptable", "a necessary means to survival", or deviating from acceptable behaviour only by an amount seen as noise, immaterial, or within a range of acceptable variances, the individual effectively sets a new anchor for acceptable behaviour, potentially placing him or herself on a slippery slope towards outright fraud.[9] Where this is rewarded in a forced-ranking system which measures success by crude shot-term numeric/financial performance indicators which underestimate risk and make no allowance for the likelihood of success of the proposed venture (note how systematically Enron offloaded business ventures into SPVs which not only took liabilities of the consolidated financial statements, but also allowed imaginary 'profits' to be booked), this can become self-reinforcing. Hence, an unintended consequence of Enron's stacking system may have been that the behaviour of the winner(s) of one round of the competition is quickly adopted by the loser(s), who either develop the characteristics and skills necessary to win in the next round or face removal from the organization.

Recent research into biological mechanisms underlying the development of fraudulent behaviour supports this interpretation on how small transgressions may gradually lead to larger ones, and how small deviations from a moral code (or standard, rule, law, regulation), may, over time, escalate into material deviations with potentially devastating consequences (Garret et al., 2016). Effectively, the brain may become 'immune' to the effects of deception, akin to an anchor creeping ever further away from the ideal spot, with the individual over time committing ever bigger frauds, a phenomenon possibly supported by, and potentially pre-disposed toward, over-optimism (Schrand and Zechman, 2011), a character trait typically favoured within organizations.

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[9] Anchoring and adjustment is a psychological heuristic made popular by the seminal work of Tversky and Kahneman (1974), that influences the way people intuitively use an initial piece of information to make subsequent judgments. According to this heuristic, people start with an implicitly suggested reference point (the "anchor") and make subsequent adjustments to it to reach their judgement. Where an unethical manager's behaviour is seen as the norm, this may form an anchor or reference point against which own behaviour may be judged. Further deviations from the anchor might be seen as insignificant, and thus acceptable, setting off a process which may lead to significant deviations from the originally accepted norm.

Hence, in the absence of a realisation within the organization of the need for a strong and fixed moral guide (an anchor which stays firmly affixed), or moderating factors which pull the individual and group back towards the moral beacon if their anchors have 'slipped', competitive internal interactions can lead to the spread of unethical behaviour from bad apples to good apples and can eventually become so ingrained that the remaining good apples have either been completely side-lined (while observing the bad apples' success and promotions) or have left the organization. As the remaining good apples may not be seen as successful by the forced ranking system, they may forcibly be weeded out until only those willing to play the game within the organization remain, i.e. accept the prevailing norm, an outcome not unlike Akerlof's 'Market for Lemons' (1970), where bad products drive out the good, and only the lemons (unethical individuals in our example) remain.[10] A race to the bottom may thus result in organizations with potentially disastrous results.

Whereas governance at board level should have picked up on the detrimental effects of its internal tournament system, and should have introduced moderating factors and circuit breakers, to induce a counterculture with high ethical standards or ethical leadership (or both, see Trevino et al., 2000), to overcome the corrosive side-effects of the stacking system, or avoid it in the first place, the tone at Enron's top was hardly focused on providing such moderation, and instead focussed on (perceived) success at all cost, creating an environment where unethical behaviour became the celebrated norm. To some extent, Enron's stacking system not only de-emphasised ethical controls but strongly conditioned towards unethical behaviour. In this respect, the described pressures on performance echoes Milgram's 1963 experiment on obedience to authority where honest, ethical, and good intentioned individuals were prepared to perform acts conflicting with their (original) personal conscience, even if this meant causing serious injury and distress (in Milgram's experiment), or in our case to expose the company to unsustainable liabilities and risks.[11]

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[10] In "The Market for Lemons: Quality Uncertainty and the Market Mechanism" Akerlof (1970) describes the demise of markets as a result of asymmetric information. Where an organization embraces a forced-ranking system, this can lead to situations where ethical behaviour is driven out by unethical behaviour patterns, as it does not pay to be ethical, and as ethical individuals are forced out since they simply may do not be competitive in an unethical environment.

[11] Presumably, Enron star employees at least originally had some of these characteristics if the ethics education at the top MBA programmes from which Enron typically recruited is worth the fees charged.

Just as groups may escalate commitment to a lost cause where groupthink takes hold (Janis, 1972; Staw, 1996; Weick, 1983), individuals can be subject to gradual escalation of self-serving dishonesty (Weick, 1964; Garrett et al., 2016). This can potentially have devastating outcomes when a forced ranking system with great rewards for the winners not only leads to frequent sporadic emergence of unethical behaviour, but results in widespread diffusion of such patterns permeating the organization (Kulik et al., 2008). Committed ethical leadership would likely have been able to put an end to such a diffusion of unethical practice. Enron, alas, was one example where a corrupt (or possibly ignorant) top reinforced unethical grassroots behaviour, with all remaining elements of the governance paradigm busy playing the three wise monkeys.

4. <a>Policy Implications of our Analysis for Auditing and Organizational Systems

Anastasopoulos and Anastasopoulos (2012) present a dynamic game-theoretic analysis of auditing for fraud and misreporting. They model a two-player game between an auditor (who chooses between two strategies: basic audit, or a more costly extended audit, which provides a greater probability of discovering fraud if it has been committed) and an auditee (who decides between committing fraud and not committing fraud). These authors' paper can be considered in the fully rational, non-psychological and non-emotional traditional economics framework. Their main findings surround audit quality and audit tenure: they recommend a more comprehensive audit to deter rational fraud commission.

In contrast, we have employed a behavioural economics approach, incorporating psychology and emotions, to consider managerial fraud in an organisation. Our main implications for auditing systems and organisational design are as follows:

a) In designing monitoring and auditing systems to check for managerial misbehaviour and fraud, it is important to note that managers may not be aware of their fraudulent behaviour, especially in the early days of fraud, and

when this fraud is 'small'. This is the period when the manager's superego may be asleep.

b) When the manager's super ego is asleep, traditional deterrence threats, such as in-depth auditing, monitoring, and punishments (such as fines, firing from the job, and potential prison sentences) may be wholly ineffective, as managers will not be aware that they are committing any offence. Van Winden and Ash (2012) emphasise the importance of educating managers into ethical behaviour.

c) When the superego awakes, the manager may then be weighing up the economic and behavioural/psychological/emotional benefits of owning up to fraud versus hiding it (similar to Van Winden and Ash's (2012) competing forces model). Excess threat may be counterproductive, and lead to more fraud-hiding!

d) Finally, design of the organisational systems and structures, and the method of motivating, rewarding and compensating employees may have a crucial effect on the spread of unethical and fraudulent behaviour across the organisation. For example, a culture that obsessively rewards 'performance' at all costs, and is tough on mistakes, may lead to unethical behaviour spreading across the organisation, infecting once-ethical employees. The organisational culture at Enron, together with its 'stacking system', is a prime example of a structure to be avoided.

<b>The Fraud Triangle

Our analysis has parallels with the work that considers the Fraud Triangle (Sutherland and Cressey, 1951; Cressey, 1953; Sutherland and Cressey, 1978; Albrecht, 2014), which suggests three conditions that need to be present for fraud to take place: motive/pressure, opportunity, and rationalisation. The Fraud Triangle is most useful in studying why and how individuals commit fraud, and in the prevention, deterrence, detection and investigation of fraud. Following Cressey (1953), Albrecht et al. (1982) compiled a list of variables (red flags) associated with the perpetration of fraud and reached the conclusion that it was a combination of three forces that underlie the incidence of fraud (thus creating the seminal Fraud Triangle). In concluding their study into fraud and fraud prevention, Albrecht et al. (1982) suggested that the three

factors interact to determine whether an individual commits fraud or not, without making the claim to be able to explain every case of fraud. Albrecht et al. (1982) add that anything that contributes to the capability of perpetrating or concealing fraud increases the opportunity for fraud. Albrecht (1991) further notes that all three elements must be present for fraud to occur (although mere perception of pressure or opportunity suffices), later adding further triangles relevant to understanding fraud (Albrecht et. al., 1995). Of direct importance to our study is the triangle presenting ways to fight fraud, with these elements: Prevention, detection and investigation (Albrecht et al., 1995).

Our model aims to further add to the understanding of fraud, by investigating the rationalisation of fraud (the third leg/element of the Fraud Triangle, originally from Cressey, 1953, and eventually adopted by Albrecht in formulating the model) in the presence of a regulator. We build on Davis and Pesch (2013) who develop an agent-based modelling (ABM) approach to examine the emergent dynamics of the spread of fraud across organizations. In their ABM, they also draw from Cressey's (1953) and Albrecht et al.'s (1982) Fraud Triangle, in order to consider heterogeneous agents working within an organisation, characterised by differing levels of motive, opportunity, and attitude towards fraud: these varying characteristics contribute to an agent being honest or, conversely, fraudulent.

Like Davis and Pesch (2013), our model considers the Fraud Triangle factors of motive, opportunity and attitude. Furthermore, we consider a 'moral hazard' (hidden action) element, not considered in Davis and Pesch (2013). That is, we consider a manager who chooses how much fraud to commit each period, and how much costly effort to exert in hiding it from the regulator, who, in turn, is exerting effort into trying to find it.

<b>Comparison of our framework with existing conceptual research.

We have considered both economic and behavioural factors affecting the manager's fraud decisions. Our work is close in spirit to Van Winden and Ash (2012). We are

also motivated by the conceptual behavioural economics analyses of fraud conducted by Di Micela da Silveira (2015) and Rafeld et al. (2017).

Kulik et al. (2008) conceptualise how fraud and unethical behaviour was endemic and spread rapidly across and throughout Enron. They note that this spread of fraud was driven both from the top-down but was also driven from the 'bottom-up', and horizontally across layers within the organisation. Kulik et al. (2008) further argue that the organisational culture at Enron (the 'tone at the top' at board level, the employee stacking system – a compensation system which effectively rewarded fraudulent, dishonest behaviour) allowed this spread of unethical fraudulent behaviour to thrive.

Kulik et al. (2008) begin their conceptual analysis of the spread of fraud within Enron by considering two inter-related frameworks: the theory of reasoned action (TRA) (Ajzen 1985), and the theory of planned behaviour (TPB) (Ajzen and Fishbein 1980; Fishbein and Ajzen, 1975). As they state, "the theory of reasoned action assumes that individuals are rational, that they make use of all available information, and that they evaluate the possible implications of their action before they decide to engage or not engage in a particular decision." Although this work appears in the 'management' literature, we draw parallels to our work by noting that this is the homo economicus approach in the standard economics literature.

The theory of planned behaviour (TPB) has parallels with our behavioural economics approach to fraud, by extending the TRA framework to include heterogenous individual attitudes, subjective norms, and perceived behavioural control. This approach emphasises the gap between (unethical/fraudulent) intentions and behaviour (the intention/behaviour gap is a key element considered in behavioural economics, and particularly in nudge theory). Kulik et al. (2008) note that, in the TPB, the attitude towards the behaviour refers to the individual's positive or negative assessment of engaging in that behaviour. "An individual's attitude is a multiplicative component consisting of the individual's strength of belief associated with the behaviour and the individual's subjective evaluation or weighted importance of the belief's attribute." In our behavioural economics framework, this would feature in the manager's utility function (his economic and behavioural CBA) in the parameters

relating to his (perceived) gains from fraud-commission, his (perceived) lost reputation from fraud-discovery, and behavioural factors such as guilt and regret.

The further factor in TPB is "perceived behavioural control." This refers to the individual's perceptions of the ease or difficulty of performing the behaviour. We note that this may relate to the Fraud Triangle in terms of opportunity to commit fraud. In our model, this opportunity to commit fraud relates to the maximum amount of fraud that can be physically committed per period.

From Kulik et al.'s 2008 discussion, we note the TPB has parallels both with our behavioural economics model, and with the Fraud Triangle. The Fraud Triangle emphasises three factors: a) Pressure (or incentives) to commit fraud, b) the opportunity to commit fraud, and c) rationalisation (the individual's attempts to justify his fraud-commission, which would include subjective norms). What the TPB, and the Fraud Triangle, emphasise is that not every manager who could commit fraud will commit fraud. The 'subjective norm- rationalisation' factor emphasises that the fraud decision is heterogenous across managers who face the same fraud opportunities. In our model, we focus on wide-spread corruption in an organisation consisting of fraudulent managers.

Di Micela da Silveira (2015) provides a conceptual analysis of a behavioural economics approach to corporate fraud. He argues that the problem with the current approach, and the policy recommendations that arise, is that it is heavily based upon the standard fully rational homo economicus approach. He argues that it is vitally important that a new behavioural economics approach is developed that considers three main building blocks: a) a systematic focus on mitigating managerial cognitive biases in making their fraud-decisions, b) continuous encouragement of employee-executive awareness of unselfish, long-term cooperative behaviours, and c) the development of new corporate strategies designed to greatly reduce the likelihood of fraud through a deeper understanding of psychological motives. Indeed, the author emphasises that management engages in both an economic and a behavioural CBA towards fraud commission. Di Micela da Silveira (2015) note several psychological factors that seem to be relevant in people's fraud-commission decisions. This includes the ability to rationalise dishonest acts. This ties in with the TPB, discussed

by Kulik et al. (2008), and with the fraud triangle. In our model, the manager rationalises his behaviour through his economic (when the superego is asleep) and his behavioural CBA (when the superego is awake).

Rafeld et al. (2017) consider behavioural patterns in fraud-commission and rogue-trading at the lone/individual level. Rafeld et al. (2017) base their analysis heavily on Tittle's (1995, 2004) control balance theory (CBT). CBT identifies an individual's desire for autonomy (trying to escape from control, and to exercise more control over others). In CBT, individuals become psychologically distressed by perceived control deficits (excess control from others) or control surpluses (excess control over others). According to the theory, individuals act to minimise these control imbalances. A key aspect emphasised by Tittle's CBT is that the desire to commit fraud is heterogeneous. Control imbalances are subjective, environment driven, depend on opportunity, and motivation. As in the TPB, not all managers who can commit fraud, will do so. This work demonstrates the parallels between a behavioural economics approach to corporate fraud and the fraud triangle: both approaches emphasise motive, opportunity, and rationalisation/attitude.

<b>The Role of the Regulator

<b>Regulators' real-world incentives: two cases

Our model demonstrated that we do not only need to consider corporate management's economic and behavioural incentives to engage, or not, in fraud. We should also understand that regulators are self-interested entities too, with their own self-interested set of economic (agency) and behavioural issues and incentives. As Benabou and Tirole (2009) argue, regulators are not necessarily the benevolent social planners of standard economics: they have their own self-interested agendas. If the regulator is not correctly motivated to regulate, then there is an incentive for her to not exert costly effort in searching for fraud, with a small probability of finding it. In our model, we considered how the regulator might be motivated to the job through gaining utility from positive economic factors (reputation) and behavioural/emotional factors (excitement, pride in a job well-done). Conversely, we considered the

possibility of negative economic/behavioural punishments (job loss, lost reputation) from not doing a good job.

Two real-world examples where these factors came into play relate to a) the 2019 Kingman enquiry into the effectiveness of the Financial Reporting Council (FRC), and b) the resignation of Martin Wheatley from the Financial Conduct Authority (FCA) in 2015. In 2019, Sir John Kingman was asked by the British Government's Secretary of State, the Rt Hon Greg Clark MP, to conduct a 'root and branch' review into the FRC. As a result of this review, Kingman referred to the FRC as a "ramshackled house, cobbled together, with all sorts of extensions over time…. it is time to build a new house." (p.5) and recommended that the FRC should be replaced with an independent statutory regulator, called the Audit, Reporting and Governance Authority. In the context of our model, we can say that the members of the FRC have suffered huge economic, behavioural, and reputational utility losses from this report, and from losing their jobs. If they had anticipated this threat, this may have driven them to do their job more thoroughly, albeit still being hindered by institutional shackles.

In our second example, we consider Martin Wheatley, who resigned from his position as CEO of the FCA in 2015. The Financial Times report, in their online Financial News page (March 19th, 2018) that Wheatley was effectively ousted from his position by the then chancellor George Osborne, who moved to install a 'different leadership' at the FCA. The case demonstrates how fragile and tenuous a regulator's position may be. Ironically, Wheatley is described by FT as a "tough-talking regulator, who … would 'shoot first and ask questions later.'" Perhaps he was considered to be too tough: he "had riled the banking community during his tenure with a string of record fines." In the interview with the FT, Wheatley claims that he had been replaced at the FCA due to a political mood change at the Conservative government.   However, the FT also notes that his position was made very difficult following a botched FCA media briefing that resulted in billions of pounds being wiped off the values of life insurers. This was "the writing on the wall" for Martin Wheatley, who was placed on 'gardening leave'.

5. <a>Behavioural Economics and Corporate Fraud: Recent Policy Research

The Financial Conduct Authority (FCA) in their 2016 policy publication "Behaviour and Compliance in Organisations", provides an in-depth consideration of the behavioural economics factors affecting corporate fraud. Their document has striking parallels with our theoretical analysis in this chapter. That is, they consider the economic factors (managerial economic incentives), and behavioural factors affecting corporate compliance decisions. Furthermore, they then proceed to consider social factors and social context. In a parallel to our discussion of super-ego, the FCA furthermore consider morality in their analysis. In their policy report, they begin by posing the question:

"What determines compliance? Standard economic models suggest that a fully rational decision maker would compare the expected benefits of rule breaking with the expected costs, the latter determined by a combination of the probability of detection and the size of punishment in the event of detection."

The FCA report emphasises that this economic CBA approach has limitations, and suggests that behavioural economics demonstrates that real-word humans do not always respond to incentives in a strictly rational way. For instance, widespread corporate fraud persists in spite of increasingly heavy penalties.

This is the focus of the FCA's 2016 report, the behavioural economics approach to corporate fraud and compliance. They examine how individual managerial biases (such as overconfidence, salience, vividness, preference biases), group pressure and group think at the collective managerial level, together with individuals' inherent conscience and morality, may affect the propensity to commit corporate fraud. A key emphasis of the FCA report is that is not just individual psychological biases that affect fraud commission. Social context, and group behaviour can play a key role. They refer to the strong evidence that corporate fraud and the likelihood of rule-breaking may be affected by organisational culture and social norms. Interestingly, the FCA refer to experimental evidence (reported in the FCA Occasional Paper 24

Behaviour and Compliance in Organisations December 2016)[12] that rule breaking is contagious. The evidence demonstrates that it becomes more widespread when we observe people form our own group cheating and breaking rules, while observing 'outsiders' cheating can actually cause us to reduce our egregious behaviour. Furthermore, organisational ideologies which provide a social justification for rule-breaking can be ruinous.

The FCA considers the example of collusion amongst NASDAQ market makers to reduce competition, thus violating competition law, and increasing the colluders' profit margins. This collusion was sustained as a social norm through an ideology that justified collusion in terms of ethics and professionalism, with failure to follow the convention being regarded as 'unethical' and 'unprofessional. The case of LIBOR manipulation provides another example of social norms and cultural ideologies sustaining rule-breaking. Thus, in addition to the fully rational CBA comparison of economic cost and benefits of compliance versus fraud, the FCA report advocates that regulators consider the behavioural biases that can affect the corporate players' CBA analysis (as in our model earlier in this chapter) by noting that "Behavioural biases can affect the way people compare the costs and benefits of non-compliance, leading to increased wrongdoing."

In addition to a consideration of the behavioural biases affecting corporate fraud commission, the FCA places strong emphasis on morality (in our model, we consider this through the role of the super-ego) They argue that regulators can increase compliance by enhancing moral considerations. The FCA presents evidence that firms can enhance compliance, and reduce fraud, by having managers and employees commit to abide by moral codes, and to use constant reminders to reinforce ethical behaviour. Interestingly, the report further notes that increased compliance, and fraud reduction, can be achieved by informing their staff of the consequences of their non-compliance for consumers (thus emphasising that people are not completely self-interested: humans are capable of 'other-regarding' behaviour), and by engaging employees' moral reasoning.

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[12] https://www.fca.org.uk/publication/occasional-papers/op16-24.pdf

The individual biases that the FCA report considers include present bias, which can lead to time-inconsistent preferences, thereby increasing the perceived benefits of rule breaking, and endowment effects, which can result in excessive attachment to existing poor governance processes. Overconfidence can result in people having excessive faith in their ability to avoid detection and unwarranted confidence in their firms' internal controls. Salience and vividness effects can result in people paying selective attention to information in their decision making. Groupthink can lead firms to make poor decisions, leading to poor governance processes.

The FCA Report also refers to the practicalities of the newly introduced Senior Managers and Certification Regime in the UK[13]:

"Regulators also have a key role in reinforcing the importance of individual morality and responsibility in decision making. The Senior Manager Regime introduced in the UK is an example of the increased focus on individual responsibility for actions that is consistent with the principles in this paper. Regulators need to consider whether compliance decisions by firms and employees are taken in a context that promotes moral reasoning rather than as part of, for example, 'tick box compliance', which risks reducing the salience of ethics in firms' decision making. Thus, the FCA report focusses on the behavioural economics of *corporate* fraud.

There has been parallel policy research investigating the behavioural economics of individual *non*-corporate fraud. For example, the Swiss RE Institute[14] examine fraud at an individual, non-corporate level, in their economic insights document, "Behavioural Economics: Shaping optimal decision-making, including fraud prevention, in insurance buying."[15] Where the Swiss RE Institute notes that insurers are currently focussing on the rational economics approach in deterring fraud (a la Becker), placing great emphasis on detection, with heavy investment in advanced analytics. They argue that behavioural economics allows a better understanding of

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[13] https://www.fca.org.uk/firms/senior-managers-certification-regime
[14] https://www.swissre.com/institute/
[15] https://www.swissre.com/institute/research/sigma-research/economic-insights-behavioural-economics.html

consumer biases that may lead to sub-optimal decision making. Insurers can use this information to influence consumer behaviours including to reduce fraud:

"In our view, understanding why people commit fraud in the first place is equally important, and here BE can help. Different behavioural biases can lead consumers to commit opportunistic claims fraud, especially soft fraud or claims padding (inflating claims amounts to more than actual values), the most common type of insurance fraud."

In the Institute's view, three key biases drive insurance fraud: social norms, the endowment effect and mental accounting. The social norm bias is where people tend to follow what others do. If a majority of consumers in a social sub-group are perceived to pad their claims as a matter of course, others in that same group are likely to follow suit.

The endowment effect is when people think their possessions are worth more than they are and inflate associated insurance claims in the case of a loss event. Another factor at play is mental accounting, when people mentally separate their money into specific accounts. If they perceive a deductible to be high and/or unfair, mental accounting may lead them to effectively compensate for this higher price by padding claims.

The Swiss RE Institute finally suggests that such frauds around insurance claims have been a long-standing drain on insurer profits. Using behavioural economics to understand the underlying behavioural economics biases behind these frauds, insurers can design ways and means of reducing fraud. For example, the way choices are presented can persuade consumers towards increased disclosure. Reframing the act of fraud whereby the broader policyholder population is presented as victim also helps. Shaping consumer behaviours can also help insurers improve claims process efficiency.

Another organisation that has focussed on the behavioural economics of non-corporate fraud is the Behavioural Insights Team (BIT) in the UK.[16] The Team was set up in the UK in 2010 by the then Prime Minister David Cameron, who was keen to use insights from behavioural economics and Nudge theory to affect public and corporate economic behaviour, such as fraud and compliance. In their report, BIT analyse the behavioural economics of personal (non-corporate) fraud, and the potential effect of the use of nudges to reduce it. They note that:

"Fraud, error and debt cost the UK economy billions of pounds each year – £21 billion is lost to fraud in the public sector, a further £96 billion is lost to errors, while £7–8 billion is lost in uncollected debt. These significant sums of money are ultimately borne by UK taxpayers, so any measures that reduce fraud, error and debt in a cost-effective way are to be welcomed."

The BIT report considers the behavioural economics factors contributing to non-corporate fraud (with many parallels to those considered in the FCA report on corporate fraud and compliance). The BIT team (colloquially known as the "Nudge Unit") discuss experimental interventions (nudges) that they attempted to reduce fraud. It is interesting to note that these behavioural nudge experiments were not artificial, in the lab… they were experiments involving actual people, and actual cases of fraud, that were draining money from the system.

As the BIT report notes: "These trials are now up and running and preliminary results are very positive. For example, Trial 1 advanced £160 million of tax debts to the Exchequer over the six-week period of the trial, the two behavioural letters in Trial 2 brought in over £1 million from doctors in additional yield to HM Revenue and Customs, while Trial 6 saved Manchester City Council up to £240,000 in council tax discounts."

The report goes on to note that "Overall, these trials showed effect sizes of up to 30 percentage points, underlining the key role that behavioural insights can play in tackling fraud, error and debt."

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[16] https://www.bi.team/

Importantly, the BIT experiments show that even relatively minor changes to processes, forms and language can have a significant, positive impact on behaviour, and can often save the public time and money too. "Indeed, if trialled on a national scale, we expect that these interventions will save hundreds of millions of pounds."

The UK BIT and the Swiss RE Institute reports have useful parallels with the FCA report discussed at the beginning of this section, emphasising the importance of looking beyond the rational CBA approach, to consider the lessons from behavioural economics, examining the effects of behavioural and psychological biases and emotions on fraud. This enables policy makers, corporations and institutions (such as auditors and regulators) to think beyond purely economic monitoring and punishment approaches, and to consider behavioural interventions and nudges to reduce corporate and non-corporate fraud.

<b>Corporate Fraud during the Covid Crisis

Some analysts have noted that corporate fraud has become particularly prevalent and insidious during the current Covid crisis, which began at the start of 2020. For example, Ernst & Young analyse the increase in corporate fraud during the Covid pandemic, employing Cressey's (1953) Fraud Triangle framework and investigate how Covid-19 has affected a) incentive or pressure, b) opportunity, and c) rationalisation in relation to fraud-commission.[17] EY note that during the Covid Pandemic "The risk of internal fraud has heightened due to an abrupt change in working practices, as well as increasing pressure on organisations and employees."

The main points of the EY analysis suggest that:

a) Enterprise-wide controls to prevent and detect fraud and network breaches may not be designed to operate in near-100% virtual environments.
b) Anti-fraud, compliance and cybersecurity concerns may also have been de-prioritised in favour of maintaining business-as-usual (BAU) services.

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[17] https://www.ey.com/en_uk/disrupting-financial-crime/financial-crime/covid-19-implications-internal-fraud

c) The reliance on staff to comply with policies and operate those controls is also under strain: as many people are working remotely, they may become disengaged and their actions may be subject to less scrutiny and oversight; similarly, financial and other concerns caused by COVID-19 may cause those in important oversight roles to be less vigilant.

d) There may be pressure on organisations and staff to report positive results – i.e., demonstrating organisations are operating as usual without a negative impact on earnings and profitability, or staff compensation and incentive plans.

As the EY note: "The new challenges posed by the COVID-19 pandemic present heightened risks across all elements of The Cressey fraud triangle (1953)". Particularly in terms of rationalisation (which has parallels with the behavioural economics approach), the report suggests that: "Employees may find it easier to rationalise defrauding their company if they think they won't be getting a raise or bonus this year. This is more likely where incentive compensation is a large proportion of total compensation, or the method of incentive compensation is narrowly focused on short-term performance or affected by earn-out provisions at acquired operations. Employees may be more inclined to commit fraud if long periods of remote working make them feel disengaged or undervalued."

6. <a>Conclusion

We have developed a model of managerial fraud. At the individual level, the manager commits small frauds over a number of time-periods: the frauds are so small that the manager's super-ego remains asleep, and the manager does not consider the frauds as consequential. At a critical time period, the super-ego awakes, and the manager becomes aware that he has committed a large cumulative level of fraud over time. Now, he stops fraud, but may react in one of two ways: he either 'owns up' to his fraud, as owning up is 'good for the soul', or he exerts increasing efforts into hiding the fraud, due to feelings of regret, combined with the sunk cost effect (relating to the fraud already committed). We then extended our model to consider the dyadic (organisational) level, whereby a corporate culture of unethicality may result in an unethical manager 'infecting' the ethical manager, such that the ethical manager is

'corrupted', mimicking the unethical manager's behaviour. We concluded our analysis with an examination of the case of Enron, a review of policy implications, and a brief look at recent research into corporate fraud.

Our model provides a basis for future research. It would be useful to further develop the model to consider the effect of other psychological and behavioural biases and emotions, such as overconfidence, anger, shame. In our model, we have focussed on the managerial dyad. The model would be further strengthened by considering a complete and complex organisational network. Furthermore, we could include an auditor as an additional player in the game. At the empirical level, we could extend our analysis beyond the Enron case to consider how our framework applies to other corporate frauds and scandals. Furthermore, we could employ experimental and neuro-economic techniques to test for the economic and psychological determinants of managerial fraud in a lab-setting. Nevertheless, it is hoped that our current analysis contributes to a better understanding, and ultimately reduction, of corporate fraud.

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