

A fraud detection model: A must for auditors

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ABSTRACT

This paper addresses a fundamental issue in financial regulation – that of the auditor's ability to detect material irregularities. If an auditor is to detect irregularities he/she must also be cognisant of fraud aetiology by drawing on such other disciplines as psychology, criminology and sociology. The paper first provides a critique of existing fraud aetiology models and then describes the ROP Fraud Risk-Assessment Model constructed by the author in a study of convicted serious fraud offenders in Australia. The main concern of the paper is with the eclectic fraud detection model (EFD), of which the ROP model is a component. The EFD model is aimed at enhancing the auditor's fraud detection ability, it has been constructed by the author and its utility successfully tested in Australia in a survey of auditors. Finally, the

policy implications for auditors of the findings obtained are also considered.

INTRODUCTION

Irregularities such as fraud that result in a materially misstated financial report are of particular interest to auditors since they have legal responsibilities for detecting and reporting such irregularities. Material irregularities include management fraud, employee fraud, error, intentional acts, other illegal acts and, finally, intentional but not fraudulent or other illegal misstatements.¹ Fraud can be defined as an act that involves the use of deception to obtain an illegal advantage. A number of surveys² have documented the increasing incidence and cost of fraud against corporations. In addition to the financial cost incurred by the victims, the cost of fraud includes the financial costs arising out of litigation, against auditors who fail to detect fraud, as well as damage to the accounting profession's credibility.

Fraud for or against a company can take the form of fraudulent financial reporting, also known as management fraud, and misappropriation of assets or employee fraud, also known as defalcation. Due to the nature of auditing and its inherent limitations, fraud is very difficult to detect for a number of reasons:

— it may be committed by people who are familiar with accounting procedures and can cover it up

- auditors do not possess all the necessary skills³ to detect fraud
- time pressure⁴ on auditors
- there is built-in conflict since auditors are asked to investigate upper management who indirectly are the same group that hired them⁵
- by detecting fraud an auditor may well be facing ‘the spectre of protracted litigation, grand juries, and trials, and one immediately sees why the auditor may hope the issue of fraud never sees the light of day’.⁶

The ability of the external auditor to detect material irregularities, including fraud, has come under increasing scrutiny and auditors are under considerable pressure to accept legal responsibility for detecting material fraud.⁷ One cannot overemphasise the need to enhance auditors’ fraud-detection ability in order to:

- reduce the performance component of the expectation gap⁸
- lower the risk of litigation for auditors for having breached their duty of care to their client and/or a third party in carrying out the audit
- detect fraud that may be instrumental in causing significant financial loss if not the complete collapse of a corporation.

Audit experience alone, however, cannot make auditors fraud-detection experts. A number of surveys in the 1990s showed that audit beneficiaries want an expanded role for auditors as society’s corporate watchdog; in other words, that auditors should be legally responsible for detecting material fraud.⁹ This view contrasts with that of auditors themselves.¹⁰

APPROACHES TO ENHANCING FRAUD DETECTION

A number of approaches to the assessment of fraud risk have been put forward in an

attempt to enhance fraud detection by auditors. Some¹¹ have suggested the use of pre-emptive fraud investigation which is a review intended to assess the vulnerability of an organisation to fraud. According to Sadgrove,¹² for such a review to be carried out successfully, one needs (a) to have adequate knowledge about both how fraud happens as well as about fraud indicators, and (b) to undertake a fraud vulnerability analysis of the company concerned. A vulnerability analysis assesses: what assets might be at risk; who might take them and who might benefit; how they might take them and sell them and, finally, how effective the controls are. Others¹³ have proposed the use by auditors of the triangle model which comprises: (a) a strong, involved, investigative board of directors; (b) a sound, comprehensive system of internal controls; and (c) alert, capable independent auditors. The same authors also pointed out that if any of the points in the triangle do not function properly, the entire triangle will collapse, and the opportunity for management fraud is increased.

Other authors have proposed more specific methods for determining if fraud has occurred and is concealed in the financial statement.

The widely-known red flags approach involves the use of a checklist of fraud indicators. The following examples of red flags are listed by Sadgrove:¹⁴

- less physical stock in the warehouse than is shown by computer records
- an employee suddenly gaining a lot of wealth, allegedly from an inheritance or a pools win and so forth
- an employee who never takes a holiday
- a supplier being given an undue amount of work or whose additional costs are accepted or who receives multiple orders at below the threshold for tendering

- unexplained credit notes
- accounts that do not generate an invoice but are used for samples or guarantee claims.

It needs to be remembered, however, that red flags do not indicate the presence of fraud but represent conditions associated with fraud; in other words, they are cues meant to alert an auditor to the possibility of fraudulent activity,¹⁵ which could have a material impact on the financial statement in a given circumstance. The use of red flags is recommended in textbooks on fraud detection¹⁶ and in auditing standards.¹⁷ The use of red flags questionnaires has three main advantages as a result of which one could reasonably expect them to increase the possibility of detecting fraud, namely raising the auditor's sensitivity to the possibility of fraud, adding structure to the consideration of fraud, and providing consistency among auditors. A number of authors, however, have cast doubt on the predictive utility of red flags in fraud detection¹⁸ since they are plagued by two limitations: (a) while red flags are associated with fraud, the association is not perfect, and (b) since they focus attention on specific cues they might well inhibit the auditor from identifying or observing other reasons.¹⁹

The cognitive approach concerns itself with auditors' thinking and reasoning that underlies their fraud-detection decision making. The cognitive approach has been used to detect fraud by utilising informa-

tion about an auditor's expectations regarding the likelihood that fraud has occurred, and his/her degree of perceptual field dependence.²⁰ The same approach has also been used to detect fraud by enabling the auditor to think like the fraud perpetrator and thus avoid being fooled by the culprit's deception tactics.²¹ According to Johnson *et al.*'s²² cognitive model, while management attempts to deceive the auditor by utilising both their knowledge of the business and accounting practices as well as deep cognitive strategies and tactics (eg masking, double play, mimicking, dazzling, inventing, repackaging, decoying) and constructing a deception, auditors can use strategies and tactics (eg anti-mimicking) for detecting such deceptions.

The present author maintains that the usefulness of the various fraud detection approaches mentioned will be enhanced if they are used to supplement one another. If auditors, however, are going to detect fraud they ought to know about the aetiology of fraud, ie why fraud is committed and by whom.

MODELS OF FRAUD AETIOLOGY

A survey of the literature reveals three models²³ of fraud aetiology. As far as the concepts used by the three models are concerned, even though they all focus on workplace fraud they do not use the same terms for it (see Table 1).

Cressey's model is based on his work with managers convicted of fraud and is

Table 1 Necessary components for fraud to take place

Albrecht	Perceived opportunity to commit fraud	Financial and/or non-financial pressure	Rationalisations
Cressey	Knowhow	Unshareable financial problems	Possesses neutralising verbalisations
Loebbecke	Conditions/Attitude	Motive	

concerned with embezzlement.²⁴ Loebbecke *et al.* talk about management fraud and defalcations,²⁵ whereas Albrecht *et al.* use fraud in such a way as to encompass both.²⁶ Major weaknesses of each of the three models are:

- Loebbecke *et al.*'s survey data were provided only by audit partners (who frequently do not perform the bulk of the audit work or make assessments of fraud indicators but simply review and approve the work of other auditors) from only one large firm. Consequently, it is not possible to generalise their findings to auditors and/or audit firms generally
- having surveyed only audit partners in large firms²⁷ Loebbecke *et al.*'s findings may not be generalisable to small firms
- Loebbecke *et al.* ignore the importance of rationalisations that make fraud possible
- Loebbecke *et al.*'s conceptualisation of fraud offenders as pathological liars is over-simplistic from a critical criminologist's point of view²⁸
- both Cressey and Loebbecke *et al.* do not conceptualise their model's three elements as being *interactive*
- none of the models attempt to account for individual differences as far as the aetiology of fraud is concerned by considering individual characteristics of a person which predispose him/her to commit fraud under particular circumstances
- all three authors have failed to conceptualise 'opportunity' so as to include the broader socioeconomic context in which fraud takes place and to locate it within a theoretical framework such as Clarke's²⁹ situational approach to criminal behaviour.

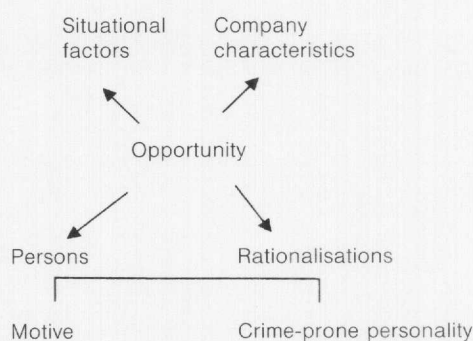
In the light of such limitations, their explanations of why people commit fraud are

incomplete and, consequently, their practical usefulness for auditors who want to enhance their fraud-detection ability is limited.

Given the limitations of the above models, a three-component model of fraud aetiology was constructed and tested. The model was constructed utilising an interdisciplinary approach to the aetiology of fraud that encompasses a critical review of empirical studies of fraud offenders³⁰ as well as drawing on an extensive critical appraisal of well-established theories of criminal behaviour from three different disciplines/perspectives, namely psychological (Eysenck's³¹ theory of the relationship between personality traits and criminality, and Freud's psychoanalytic theory), sociological³² and criminological³³ theories of criminal behaviour.³⁴

The three-components of the ROP fraud risk-assessment model are: rationalisations, opportunity, and crime-prone person, abbreviated as ROP model (see Figure 1). Also, a new model of fraud detection (eclectic fraud detection model, (EFD)) with ROP as one of its components was constructed. The ROP model was tested successfully in a study of 50 convicted serious fraud offenders in Victoria, Australia, and the usefulness of the EFD model was examined in a survey of a sample of 108 Australian auditors.³⁵ Before

Figure 1 The components of the ROP Model³⁶



considering the EFD model in detail, the ROP model will be briefly described.

THE ROP FRAUD RISK-ASSESSMENT MODEL

The basic premise of the ROP model that the probability of fraud is a function of the three components is expressed as $\text{Pr}(\text{fraud}) = f(R, O, P)$. The ROP model also acknowledges that while some fraud offenders have no second thoughts about embarking on a spree of fraud offences, for others it can be an agonising decision and they end up being serial fraud offenders when they only intended to commit a single offence. Finally, for other fraud offenders greed replaces the original need for money to pay a debt, for example, having become more confident they continue offending until they are caught.

Methodology used to construct the ROP model

Cases were selected from the files of the Major Fraud Group (MFG) of the Victoria Police in Australia because permission was given to access MFG prosecution files and the MFG had a relatively quick turnover of cases and a high conviction rate. The criminal prosecution files contained a lot of vital information such as details of the offence/s charged, the person charged and trial information. Data pertaining to 21 variables were coded and analysed using the SPSS package.

In view of the study's focus on major fraud committed by people in positions of financial trust, a case was selected for inclusion in the study if:

- the files were accessible because it had been processed by the court and the defendant had been sentenced by the court
- it involved one or more of the following convictions for deception (as

opposed to theft): obtaining property by deception; obtaining financial advantage by deception; forgery and uttering; false accounting; and/or deception

- the offender(s) belonged to occupational categories involving financial trust, eg company directors, lawyers, bank officials, accountants, brokers, share traders or management.

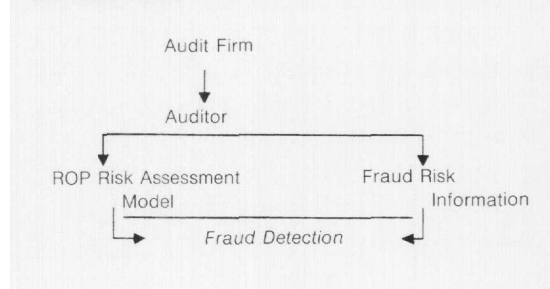
The study of 50 serious fraud offenders confirmed the utility of the three components of the ROP model³⁷ which subsequently formed part of the EFD model.

THE ECLECTIC FRAUD DETECTION MODEL

As already indicated above, there has been an increasing amount of published literature on how auditors can become better at detecting material irregularities, including management and employee fraud. The fraud detection model constructed and subsequently tested in the study reported below has been intended to:

- bring together the essential components of a fraud detection strategy and guidance on the relevant tactics
- enhance auditors' ability to detect fraud by incorporating a component based on the ROP model
- demonstrate how feedback from auditing experience in detecting fraud can be used to train auditors in the task,

Figure 2 The components of the eclectic fraud detection model³⁸



as well as to set up and update fraud-detection databases to keep up with the inventiveness of many fraud perpetrators.

The audit firm needs to:

- provide incentives for auditors to probe fraud deep enough to counter the deterrent effect of such undesirable consequences of fraud detection as litigation
- ensure that auditors are not under pressure to complete audits within unrealistic time limits
- ensure that management has not restricted the scope of the auditor's work.

The auditor:

- does not rely on uncorroborated representations from management³⁹
- specifically assesses the risk of material misstatement⁴⁰
- is both analytical and inquisitive⁴¹
- is aware that his/her type of client audit experience can impact on how far the audit focuses on opportunities for fraud and knowledge on prior existence of fraud should be used⁴²
- has adequate knowledge of the company's environment and its accounting system as well as being aware of high-risk audit areas for fraud within a company⁴³
- assesses inherent risk, control risk and detection risk in this order⁴⁴
- in assessing control risk evaluates management's integrity and competence⁴⁵
- assesses the composition of the board of directors and the characteristics of the non-executive directors⁴⁶
- takes an individual approach⁴⁷ in combination with the frontal and side approach⁴⁸

- uses counter-deception tactics to identify deception constructed by management⁴⁹
- if a control weakness is found, determines whether it has been abused and does not just correct it.⁵⁰

As regards fraud-risk information about (a) individuals and (b) companies, a fraud-proneness profile of person/s in positions of trust involves looking at the individual's lifestyle, accomplices, criminal record and behavioural changes. A company's fraud-risk information includes accounting controls of the company, fraud prone areas, and the company's organisational structure and its relationship with other parties (eg auditors, lawyers) as well as tip-offs about frauds and complaints.

A basic premise of the eclectic fraud detection model is that fraud detection is preceded by a pattern-recognition/fraud-risk-assessment decision-making process. An auditor, of course, needs adequate knowledge of a company's operating environment. While the EFD model addresses the broad range of information inputs into effective fraud detection, it does not claim to guarantee that, using it, an auditor will detect carefully-concealed frauds. It needs to be pointed out in this context that while, on the one hand, recognising even one fraud indicator can lead an auditor to discover fraud, on the other, recognising a number of red flags and pursuing them extensively may prove them to be false alarms. For the model to be applied successfully, the auditor is required to process, evaluate critically and synthesise a significant amount of information (including information contained in the ROP model) about a client. It is the ability to synthesise the information concerned that is essential for the model to work.

TESTING THE EFD MODEL

Methodology

The applicability of the model was tested in a survey of Australian auditors experienced in detecting material irregularities, including management and employee fraud. A self-administrated structured questionnaire was used to collect data on auditors' experience with fraud detection. The questionnaire comprised three parts and was modelled on the one used by Loebbecke *et al.* Part I collected summary information about each of the irregularities which the respondent had experienced during the preceding five years. Respondents were asked to provide information on the different types of irregularities (see types above), the number of times that irregularity was encountered, the industry the client operated in, what alerted the auditor to the irregularity, whether there were effective internal controls in place, whether a code of conduct existed and, finally, whether there was a material financial impact on the accounts.

Part II asked respondents to describe one particular irregularity they had encountered to provide data on:

- who was involved
- the industry and the status of the client audit areas affected by the irregularity
- how long the audit firm had been an auditor of that client when the irregularity was discovered
- over what time period that particular irregularity had been committed
- the audit procedures first indicating the irregularity
- whether the presence of a fraud auditor or forensic accountant on an audit team would have assisted in discovering it earlier than it had been
- to whom the material irregularity was reported.

They were also given a list of all the fraud indicators listed in the Auditing Standards and were asked to state, bearing in mind the irregularity concerned, whether a fraud indicator was applicable to the engagement, relevant to the irregularity and, finally, whether it had alerted them at the planning stage. In Part III, respondents were asked to provide demographic data about themselves and their professional experience.

The respondents were external, internal and public sector auditors. Accounting practices were accessed from the yellow pages, and an attempt was made to cover not only the large accounting practices but the medium sized as well. One hundred and seventeen managing partners were approached, 76 agreed (ie 65 per cent). The managing partners notified the researcher as to the number of questionnaires they needed per practice and they distributed the questionnaires to those individuals who had detected, or investigated an irregularity. Where firms employed forensic accountants or fraud auditors they were asked to distribute questionnaires to them as well. A total of 125 questionnaires were returned, representing a response rate of 29 per cent. Seventeen of those returned were incomplete and were not included in the analysis. Thus, the findings reported relate to 108 questionnaires, representing 25 per cent of the original number distributed.

Findings

Regarding patterns in auditors' detection of the six types of irregularities, Table 2 shows that irregularity-prone companies are characterised by a lack of an effective internal control system and the absence of a code of conduct. This finding is not surprising when it is remembered that 76 per cent of the companies where management fraud had occurred had ineffective internal controls and 64 per cent lacked a code of conduct. Similarly, of the companies

Table 2 Patterns in auditors' detection of different irregularities

Type of irregularity	Industry(ies) with high incidence of irregularity	The form(s) it is likely to take	Audit procedure(s) likely to alert auditors to existence of irregularity	Statistically significant correlates of the irregularity impacting materially on company's accounts
Management fraud	Manufacturing, trusts and fund management, construction	Misappropriation of funds; window dressing	Management review and/or tests of controls	Lack of effective internal control system, absence of a code of conduct
Employee fraud	Manufacturing, government administration and defence, finance and insurance	Expenses recorded incorrectly	Management review and/or tests of controls	Lack of effective internal control system, absence of a code of conduct
Other illegal acts	Finance and insurance, manufacturing	Non-compliance with accounting standards, breach of security and insurance industry regulations	Substantive testing and/statutory records review	Absence of a code of conduct
Other acts	Trusts and fund management, finance and insurance	Non-compliance with trust accounts	Review of records	Lack of effective internal control system, absence of a code of conduct
Other illegal misstatements	Trusts and fund management, manufacturing	Accounts did not add up	Review of financial statements and/or review of accounting records	Absence of a code of conduct
Errors	Trusts and fund management, no industry category, manufacturing	Financial statement errors	Review of financial statements	Lack of effective internal control system, absence of a code of conduct

where employee fraud occurred 65 per cent had ineffective internal controls and 56 per cent lacked a code of conduct. As already indicated, these two company characteristics are significantly correlated. Furthermore, the material impact of these deficiencies on the accounts is pervasive. These findings provide support for the eclectic fraud detection model and attest to the importance of auditors carrying out further tests if they are auditing a company with an ineffective internal control system

and lacking a code of conduct. The survey results suggest that these two characteristics point to a higher probability that a material irregularity in the accounts exists. This finding is in agreement with the conclusion reached in the KPMG (1995a) survey⁵¹ that any steps taken by companies to reduce the possibility of an irregularity (including fraud) that will impact materially on the accounts must include improvement in internal control systems and the implementation of a code of conduct.

Table 3 The statistical relationship between applicability and relevance of red flags and whether the auditor was alerted by them

	Relevant	Alerted
AP	Business environment (p = 0.001) Integrity/competence of management (p = 0.04) Unusual pressures (p = 0.04) Unusual occurrence/transaction (p = 0.05) Unsatisfactory records (p = 0.03) Factors relevant to an EDP environment (p = 0.01) Internal control NS	Business environment (p = 0.008) Integrity/competence of management (p = 0.002) Unusual pressures (p = 0.01) Unusual occurrence/transaction (p = 0.04) Unsatisfactory records (p = 0.04) Internal control NS
REL		Business environment (p = 0.001) Internal control (p = 0.008) Integrity/competence of management (p = 0.007) Unusual occurrence/transaction (p = 0.03) Unsatisfactory records (p = 0.02)

NS = Not statistically significant.

As discussed earlier in this paper, a key question in the fraud detection literature has concerned the usefulness of red flags. Taking each of the eight red flag categories separately, Spearman's rank correlation coefficient tests were carried out to examine the relationship, if any, between a red flag being applicable to the engagement, relevant to the irregularity and whether it alerted the auditor during the planning stage. Table 3 shows the results of these tests.

In interpreting the significance of the relationships depicted in Table 3 it should be noted that no test was possible in the case of one red flag category, namely 'market pressures' (declining industry, industry subject to complex legislation, volatile industry with numerous corporate takeovers) as there were only three cases in this category. Also, as far as 'factors relevant to an EDP environment' is concerned,

only four examples of that particular red flag were reported as having alerted respondents and, consequently, no correlation test was possible with whether that red flag was applicable to the engagement or relevant to the irregularity. With the exception of internal control (p = 0.072), a statistically significant relationship was found between all the remaining five categories of red flags being considered both applicable to the engagement and relevant to the irregularity and alerting the auditor to the existence of an irregularity. It needs to be remembered, however, that the respondents provided the data in hindsight. The following conclusions can be drawn from Table 3:

- deficiencies in internal control did not alert auditors to the existence of an irregularity if those particular red flags were considered relevant to the irregu-

- the red flags pertaining to unusual pressures only alerted the auditors to the existence of an irregularity if they were deemed applicable to the engagement
- the red flags comprising the 'factors relevant to an EDP environment' category only alerted the auditors to the existence of an irregularity if they had been considered applicable to the engagement.

Thus, it appears that the relationship between the applicability and relevance of a red flag and whether the auditor was alerted by it depends on the particular category of the red flag.

The results yielded by the survey of auditors add to the broad range of information-inputs into effective fraud detection contained in the eclectic fraud detection model and show the model's applicability. More specifically, with statistical significance at $p=0.05$ the findings obtained⁵² show that:

- used on their own, red flags are not particularly useful in alerting auditors to the existence of material irregularities at the planning stage
- there are high-risk industries (eg manufacturing) where the auditor is significantly more likely to encounter different types of irregularities (eg management fraud, employee fraud, and error)
- certain audit procedures are more likely to identify a particular type of irregularity (eg substantive audit procedures were useful in identifying window dressing)
- each type of irregularity is more likely to take a particular form (eg theft of cash, window dressing)
- certain audit areas (cash and provisions) are more likely to evidence fraud
- the lack of an effective internal control system and the absence of a code of corporate conduct are significant correlates of an irregularity (including management fraud, employee fraud and errors) impacting materially on the accounts.

In support of the models proposed by Cressey and Albrecht *et al.* the findings also stress the importance of the auditor being alerted to information about individuals within a company who are at high risk of perpetrating an irregularity, including fraud, because they face serious financial problems. The financial problem itself is most often due to a person in a position of trust living beyond their means for one reason or another.

CONCLUSIONS

Fraud detection cannot be learned by auditors who rely on their professional experience alone, nor are red flags the useful tool they have been held out to be. The finding that there are patterns in the kinds of relationship between different industries, different irregularities, different signs that alerted the auditors, and different audit procedures that appear to detect them, means that an auditor's fraud detection ability will be enhanced if they utilise the eclectic fraud detection model. It can be concluded that the successfully tested fraud detection model proposed is more likely to be useful to auditors as it makes good the deficits in the three fraud aetiology models discussed above. It does this because it weaves together features and patterns identified at different levels, namely: the economic environment, the particular industry, the company, particular financial areas within the company and particular individuals holding positions of financial trust where they can effect fraud. This knowledge enables the model developed to be more useful to auditors in a more practical way,

by providing specific guidance on what to look out for and how to approach it in planning their audit and carrying out a fraud risk-assessment, thus enabling them to identify ways of detecting, preventing and reducing major fraud within companies more effectively and efficiently than appears to be the case at present. It is worth noting that the revised AUS240 (2002) expects auditors to make enquiries at the planning stage with respect to fraud or error and assess how the financial report might be materially mis-stated as a result of fraud and error. The EFD model if used by auditors will enhance their ability to fulfil the above responsibility.

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