CHAPTER 10

White-Collar Crime Detection

Abstract In Norway, 405 white-collar offenders were convicted and imprisoned between 2009 and 2016. Journalists detected 25 percent of these criminals, followed by crime victims, bankruptcy attorneys, internal auditors, tax authority clerks, bank employees, external auditors, and police officers. Many of these detections were based on whistleblowing to external journalists, internal auditors, and others. The sum of money involved in crime is significantly larger in cases detected by journalists. Only 5 percent of the criminals in our sample were detected by auditors. Signal detection theory may shed some light on why some actors discover and disclose more white-collar crime than others. It holds that the detection of a stimulus depends on both the intensity of the stimulus and the physical and psychological state of the individual.

Keywords Auditor detection • Crime detection source • External auditor • Internal auditor • Journalist detection • Media coverage • Screening theory • Signal alertness • Signal detection theory • Whistleblower

This book is concerned with the magnitude of white-collar crime. We define convicted white-collar criminals as the tip of an iceberg. Based on expert elicitation, we have estimated the tip to be only 9.2 percent of the total iceberg, since 1.1 billion NOK are detected annually, while the estimated magnitude is 11.9 billion NOK annually.

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White-Collar Versus Social Security

We contrast white-collar crime with social security fraud on the spectrum of financial crime. We argue that while social security fraud is committed by people with small and limited resources, white-collar crime is committed by people with large and almost unlimited resources. Based on studies by Proba (2011, 2013), the tip of the total iceberg for social security fraud is estimated at 3.1 percent, since 0.3 billion NOK are detected annually, while the estimated magnitude is 9.8 billion NOK annually.

A number of perspectives can be applied when discussing white-collar crime and social security fraud:

- Crime at the top in private businesses, political bodies, and government agencies can be a greater problem in society than most have thought. The head of the Norwegian police unit for investigating economic crime believes that three out of four economic criminals probably go free, and that the chance of being caught should be larger than one to four. Estimates in this book suggest that the situation is much worse.
- The tip of the white-collar crime iceberg represents crime at a cost of more than 1 billion Norwegian kroner every year, for which white-collar offenders are convicted and imprisoned. We used a panel of 15 experts to estimate the real scale of white-collar crime in Norway. The overall estimate is more than ten times larger than what is visible in court verdicts: 12 billion NOK annually.
- While very many white-collar criminals go free, the Norwegian media, politicians, and authorities direct their efforts to social security fraud. The proportion of police reports from NAV (the Norwegian labor and welfare service/Norwegian social security authority) not being pursued through the courts dropped from 25 percent in 2011 to 15 percent in 2015 (i.e., there was an increase in the percentage prosecuted over this period). We question whether Norwegian society prioritizes the fight against white-collar crime strenuously enough.
- The media and the government are doing a lot to emphasize social security fraud as a significant and major problem in society. White-collar crime, on the other hand, is referred to as individual cases, not as a fundamental problem in society. Our estimate suggests that white-collar crime costs society more than social security fraud and,

in that sense, is a larger problem and more of a threat to a modern democratic society such as Norway.
- It is in our view not objectively justified—or in the interests of society—for the government and media to punch harder and more strenouously at welfare fraud than on elite offences.
- Regarding the rule of law, it is particularly unfortunate if discrimination within law enforcement arises because it is more natural for humans within the managing elite to perceive law violations by those "down there" (the social security fraudsters) as a more fundamental problem in society than law violations by those "up there" (white-collar offenders) who themselves belong to the elite.

The share of reports from NAV dismissed by the police reduced from 24 percent in 2011 to 15 percent in 2015. And almost every court case against those accused of welfare fraud in 2015 found the defendant guilty (97 percent of cases). This means that a very large proportion of people being accused of committing welfare fraud end up being sentenced. But what does this tell us about the probability of actually being caught?

We know that all the cases NAV reports to the police each year amount to as little as 0.15 percent of total welfare payments (about 300 million NOK in 2015). Comparing this observed amount with the expert assessment of welfare fraud on a scale of about 5 percent of total payments each year (10 billion NOK in 2015), leaves us with two possible explanations.

For the numbers to add up, NAV must have a fraud detection rate of about 3 percent (0.15 out of 5). (It seems unlikely that the detection rate in reality is even lower than this, but it cannot be ruled out.) Alternatively, if NAV's detection rate in reality is higher than 3 percent, then the established estimate of 5 percent welfare fraud has to be deemed unreasonably large.

NAV's own employees assess that they detect about 11 percent of all fraud being committed each year. If that were the case, we would be looking at fraud amounting to about 1.4 percent (0.15/0.11) of total payments each year, or about 3 billion NOK in 2015.

Unlike the United States, Norway has no large African-American or Spanish-speaking minority. Unlike the UK, Norway has no large minority from former colonies. Minorities in Norway have emerged recently as a consequence of labor migration and refugee routes. As in most other

countries, minorities are overrepresented in welfare programs administered by NAV in Norway and as experienced by front-line workers at NAV (Terum et al. 2017: 4):

> North Africans (particularly Somalis) constitute the largest minority group on social assistance. Norwegian ethnographic studies indicate that front-line workers experience Somalian men to be particularly demanding. Somalian recipients have also reported being treated arbitrarily and disrespectfully and experiencing personally invasive behavior by front-line workers.

Terum et al. (2017) studied discrimination in the implementation of social programs administered by NAV. The researchers expected to find similar discrimination in Norway towards claimants with North African names, as other researchers have found regarding Spanish and African-American names in the United States. However, both demographical and cultural differences exist between the welfare systems of the United States, the UK, and Norway, which probably create dissimilar tendencies. Norwegian welfare programs are considered generous and reach a larger proportion of the population.

In particular, Terum et al. (2017: 5) studied potential discrimination in the qualification program in Norway, which is a program established as the main policy instrument to fight poverty and social exclusion:

> The aim of the program is to improve the labor market attachment of claimants who have complex problems and cannot immediately be integrated into the labor market but, nonetheless, are deemed capable of working. The program targets individuals who are long-term recipients of social assistance. Unlike social assistance, the qualification program is not only a benefit scheme but also a full-time activation program, where claimants are referred to as participants. Each participant in the program has a right to an individually designed weekly plan that involves 37.5 hours of extensive training, counseling and related activities geared towards increasing their opportunities of finding ordinary work.

Terum et al. (2017) conducted an experiment involving 470 Norwegian front-line workers to investigate whether their decisions to sanction noncompliance of activation requirements varied with the ethnicity of the welfare claimant. The study shows that front-line workers did not sanction claimants with a North African name more often than claimants with a native Norwegian name.

Table 10.1 Detection of white-collar crime

Rank	*Crime detection source*	*Criminals*	*Fraction (%)*
1	Journalists investigating tips from readers	101	25
2	Crime victims suffering financial loss	52	13
3	Bankruptcy attorneys identifying misconduct	45	11
4	Internal auditors controlling transactions	45	11
5	Tax authority clerks carrying out controls	25	6
6	Bank employees controlling accounts	18	4
7	External auditors controlling clients	18	4
8	Police officers investigating financial crime	9	2
9	Stock exchange clerks controlling transactions	4	1
10	Other knowledge workers as detection sources	88	23
	Total	**405**	**100**

Crime Signal Detection

In Norway, 405 white-collar offenders were convicted and imprisoned between 2009 and 2016. Table 10.1 lists how these criminals were detected. We find journalists occupy the top crime detection source position, followed by crime victims, bankruptcy attorneys, internal auditors, tax authority clerks, bank employees, external auditors, and police officers. Many of these detections were based on whistleblowing to external journalists, internal auditors, and others.

Sources of Crime Detection

A comparison of the white-collar crime cases detected by journalists, with those detected by others, is presented in Table 10.2. Some interesting differences are statistically significant. First, the sum of money involved in crime is significantly larger in cases detected by journalists. The average amount for journalist-detected criminals is 110 million NOK (approximately $14 million). The statistical analysis in Table 10.2 and the following tables was implemented with a sample size of 369 convicted white-collar criminals.

Strangely, criminals detected by journalists are registered with a lower income, less tax, and fewer assets than white-collar criminals detected by others. Not so strange, however, is that the number of people involved in criminal activity is larger in cases detected by journalists. External detection is probably easier when more criminals are involved in the offense.

Table 10.2 Comparison of journalist and non-journalist detected white-collar criminals

Total 369 white-collar criminals	*97 detected by journalists*	*272 detected by others*	*T-statistic difference*	*Significance of t-statistic*
Age convicted	48 years	48 years	−0.512	0.609
Age at time of crime	43 years	44 years	−0.893	0.372
Years in prison	2.5 years	2.2 years	1.659	0.098
Crime amount	110m NOK	26m NOK	4.783	0.000
Personal income	260,000 NOK	429,000 NOK	−2.058	0.040
Personal tax	113,000 NOK	201,000 NOK	−2.185	0.030
Personal wealth	1.6m NOK	3.2m NOK	−1.050	0.294
Involved persons	5.0 persons	2.8 persons	8.186	0.000
Business revenue	234m NOK	214m NOK	0.381	0.704
Business employees	136 persons	132 persons	0.094	0.925

Some of the characteristics are not significantly different. For example, criminals detected by journalists have the same age as criminals detected by others. Likewise, criminals detected by journalists are associated with organizations of about the same size as criminals detected by others.

When we compare financial crime categories committed by white-collar criminals, in terms of detection, results indicate that journalists tend to detect fraud to a great extent, but in less of the other categories, as shown in Table 10.3.

Since a substantial fraction of white-collar criminals are detected by journalists, and very few are detected by traditional law enforcement agencies, there might be lessons to be learned from media working procedures. Journalists review information and information sources in established and developing networks of individuals located in key areas of the economy. Journalists study accounting reports and other information, and receive documents from their network of sources. They interview attorneys, competitors, the police, and authorities. They set a case aside for weeks and months until new information emerges. In the meantime, they keep the information top secret, until publication for the first time.

Investigative journalists tend to develop hypotheses about phenomena and causality. They are very different from reporting journalists who only tend to relate what they have heard or seen. Investigative journalists

Table 10.3 Financial crime categories by detection sources

Crime category	*Total detected in each crime category*	*Journalist detection in each category*	*Journalist detection fraction (%)*
Fraud	160	52	33
Theft	17	2	12
Manipulation	127	28	22
Corruption	65	13	20
Total	369	95	26

develop an idea via a study of potential offenders and their victims. They apply systematic analysis and generally treat their sources with care and professional concern.

In most criminal areas, it is expected that a combination of victim and police is the main source of criminal detection. After crime victims suffer an injury or a loss, they tend to report the incident to the police who investigate and hopefully find the offender(s). In cases of financial crime by white-collar criminals, it is often quite different. A victim is frequently not aware of the injury or loss. For example, accounting fraud resulting in tax evasion is not a harm or damage perceived by tax authorities.

A number of angles can be explored in the process of white-collar crime detection within the news media. In addition, we have the news media (newspapers and online media) that specialize and focus on financial information of all sorts, and report on this regularly. For these media, the sources of information can be traditional, for example, tip-offs, company reports, stock-exchange information, and press conferences, as well as other sources. For regular news media spread out over the country, the situation can be quite different. The detection of white-collar crime can arise from a tip-off from a whistleblower or as official information if the police or an economic crime prosecutor performs a search locally. Whistleblowers in many cases alert journalists to serious crime and are sometimes the true detectors, not the journalists or media.

Additionally, the way the news is treated in the news media is dependent on many variables that occur at the same time: Do the media have the right journalists in place at the time? Do they have an interest in the matter? Do they know anything or anyone related to this? There will also be a resource balance taking place. The resource perspective in leading media houses is concerned with knowledge management.

Not many news media outside of the larger ones will be able to allocate journalists to work on an investigative white-collar crime for months. In the cases where they have done this, editors seems to be uncertain as to whether this allocation of resources was worthwhile relative to the size and the complexity of the case. For a common, non-specialist news media, there will always be a balance between resources and the newsworthiness of the matter at hand. If a major white-collar crime story had emerged in Norway in the weeks after the July 22 terrorist attacks in 2011, it is unlikely that the story would have attracted much attention in the general public press.

The general news media have a constant incoming flow of news on hand, and there is an ongoing daily prioritization of what is important and what should be published. For all news items there are some general rules of journalism that come into play: Is the item important to many people? Is it really news? Is it possible to get reliable information on this? Is it possible to approach the right people with the right questions? Can both parties in a conflict be approached? And in addition to these questions, there will be a question as to whether the news organization at this point in time has the resources to deal with the item. If the journalist knowledgeable about economic matters is on holiday, it is doubtful whether the news media organization will come back to the item at a later date. That will depend on the development and the newsworthiness of the item at the second point in time. If the news organization is the first to report on a crime and it is regarded as "hot", it will probably do whatever possible to handle the matter at hand, knowing that other media, and especially online media, can report on the same matter and as such "steal" the story. There is always internal pride in a news organization when it can report on a matter of significant interest, and be cited by other news organizations.

The organizational culture also has an influence on white-collar crime detection among journalists. If you have journalists that are driven to win investigative journalism prizes (e.g., SKUP in Norway), there is a higher possibility that such stories will be published. But this will differ greatly among news organizations. Øvrebø (2004) showed in a study of the Norwegian newspaper *Dagsavisen* that after a change of editor-in-chief in 2001, the news profile and priorities of the newspaper changed according to the principles laid down by the new editor when she took up her position. It can be argued that an editor's personal preferences can influence the news priorities of a newspaper, and this relates to all types of editorial material, whether it is general, sports, culture, or financial news.

For a general news organization, white-collar crime is not a big story in itself unless it has repercussions for well-known people locally or if something happens to the organization where the crime has taken place. Nationally, it can be a big story if the person is well-known or if the crime in itself is of an unusual nature. If a main employer locally has to file for bankruptcy because of a white-collar crime, then the story is more than just another white-collar crime case since it has wider consequences that turn the world upside down for ordinary people in this local area. Then the white-collar crime story will take the form of another typical, important, news story and be followed and treated as such, and the white-collar crime element will be mixed with other elements and consequential stories, building on the starting point as a white-collar crime story. Campbell (1997) studied the journalistic process of environmental news in Scotland, and addressed the information sources which are used in the news process. The study showed the preference for human sources as opposed to library-based information and discussed the influence of pragmatic constraints like time and space on the production of news. It can be argued that this process is similar to the news-gathering process for white collar crime.

The argument of white-collar crime detection among journalists seems to be related to the story's importance in itself and, as such, it will be treated as just another crime or news story and have the same internal process. For smaller news organizations without journalistic specialization in financial matters, the white-collar crime story will be treated according to the news prioritizing structure of that particular organization. For larger news organizations that typically have separate sections for financial and economic news, the story will be treated within the prioritizing of that particular section. And if the story is big enough in total it will be moved from the particular finance or economics section into the general news section of the organization. The higher the profile of those involved, the more likely it is that the story will have a more centralized coverage; it will be moved into what is often the first section of the newspaper or the prioritized areas of a website's front page.

The first four of the 10 detector categories in Table 10.1 made up 60% of the total crime detecting sources and out of these the first two—journalists investigating tips from readers and crime victims suffering loss—made up 38%. It can be argued that these two categories are more susceptible to journalistic interest than the others, simply because it is easier to construct news stories based on these journalistic angles. Themes like manipulation and corruption are much more difficult to make into a

story that is interesting for the readers simply because it is more complex and difficult to describe these matters in layman's terms. A tip from readers that is given to a news medium is, most of the time, accompanied by a subjective story from the person giving the tip that in turn gives the journalist clues to work with and discuss internally in order to assign the right news priority and angle. This is also supported by the breakdown in Table 10.3 showing that fraud is the category having the highest percentage of journalistic detection.

White-collar crime detection and follow up seems to be related to a number of simultaneous journalistic procedures and cultural elements. For specialized publications in the financial information area, the white-collar crime news arena is closer at hand and the organization will typically be able to delve deeper into the matter. If white-collar crime is detected by general or local news organizations, the procedure involved will more often take the form of a general news story with the resource balance that follows from that. It can also be shown that white-collar crime is more often detected by journalists if it is based on a tip from readers or if it is reported as fraud. Underlying all this are the internal news preferences and editorial guidance that are part of the policies of the news medium.

Finally, the most obvious reason for the high detection fraction by journalists is the fact that one of the criteria for our sample is newspaper coverage of the case. Naturally, this will lead to a bias towards journalist detection.

Auditing Role in Crime Detection

The role of auditing in the detection of white-collar crime is an interesting topic, as it is not obvious that auditors are able to detect crime. This might have to do with the responsibilities of auditing functions as well as procedures and practices followed by auditors in their work. For example, Beasley (2003) is concerned with the fact that auditors seem to struggle with reducing occurrences of material misstatements due to fraud, even in the light of new auditing standards. The focus of new standards remains on fraudulent activities that lead to intentional material misstatements due to fraud, and it expands the guidance and procedures to be performed in every audit. The expanded guidance might hopefully lead to improvements in auditor detection of material misstatements due to fraud, by strengthening the auditor's responses to identified high fraud risks.

One of the surprising results of this research is the lack of crime detection by auditors: Only 18 (4 percent) of the 405 criminals in our sample were detected by auditors. Moyes and Baker (2003) asked external, internal, and governmental auditors to evaluate the effectiveness of various standard audit procedures in detecting fraud. Although external and internal auditors differed in the types of audit procedures they recommended, the authors conclude that "the audit procedures judged more effective in detecting fraud were those which provided evidence about the existence of internal controls and those which evaluated the strength of internal controls", and that "strategic use of standard audit procedures may help auditors fulfill their responsibilities under SAS No. 99" (Moyes and Baker 2003: 199). Furthermore, "the results of this study indicate that fraud detection might be improved through the strategic use of standard audit procedures earlier in the audit examination.…If these audit procedures were applied during the preliminary stages of the audit, they would be more likely to indicate the potential existence of fraud, in which case the auditor would have more time to revise the audit plan and conduct other necessary investigations" (Moyes and Baker 2003: 216).

Similarly, Albrecht et al. (2001) reviewed fraud detection aspects of current auditing standards and the empirical and other research that has been conducted on fraud detection. They concluded that "even though the red flag approach to detecting fraud has been endorsed by policy makers and written about widely by researchers, there is little empirical evidence that shows the red flag approach is an effective way to detect fraud, especially for fraud that has yet to be discovered" (Albrecht et al. 2001: 4). Their research review on the subject reveals that one of the major conclusions drawn from previous studies included the fact that only 18–20% of frauds appear to be detected by internal and external auditors, and further that only about half of the perpetrators of frauds detected are duly prosecuted. The article also calls for further fraud detection research. These detection rates are loosely corroborated by Silverstone and Sheetz (2003), who estimate that approximately 12 percent of initial fraud detection is through external audit, and approximately 19 percent arises from internal audit. (Both of these estimations apply to the American context.)

An article dealing with the responsibilities for prevention and detection of white-collar crime refers to a study undertaken to map how members of the accounting profession viewed the changing role of the external auditor following the introduction of SAS No. 82 (Farrell and Healy 2000: 25):

> Most of those answering the questionnaire disagreed that they should be responsible for searching for fraud.…Clearly, this notion concerning the auditor's responsibility is not widely held by the public at large.…The general public and Congress certainly sided against the CPAs and was the reason for this legislation.

As to the question of whether certified public accountants (CPAs) should act as police or detectives when performing an audit, the response was a resounding no (Farrell and Healy 2000: 25):

> This may also indicate that changes brought about with the implementation of the SAS No. 82 requiring a *policing component* clearly require added responsibility and may necessitate additional training and changes to job description requirements. Again, although the general public may believe policing is within the auditors' duties, even SAS No. 82 does not require this.

Similarly, an investigation into fraud prevention and detection in the United States uncovered that the majority of CPAs that responded to the study believed the external auditor's responsibility for fraud detection extends only to assessing the probability of fraud and planning the audit accordingly. They ranked internal auditors as the group most effective in detecting fraud, followed by fraud examiners and client management.

Jones (2004: 12–13) presents a slightly more balanced view on the auditor's role in crime detection:

> A persistent debate has dogged relationships between auditors and managers. This debate revolves around the precise roles and duties of each party in relation to fraud and corruption, and particularly who should take responsibility for investigation. Current legal and professional precedents leave little doubt that management bears the main responsibility for ensuring that reasonable measures are taken to prevent fraud and corruption. In any event it is common practice for managers to request assistance and advice from auditors upon suspicion or discovery of fraud. The final responsibility must lie with managers unless the auditor has given specific assurance regarding particular controls or the absence of error or fraud.

In a study in Norway, researchers found that 11 percent of cases of white-collar crime were detected by auditing functions. This is lower than the 4 percent (according to our sample) reported above, and also

significantly lower than the results presented by Albrecht et al. (2001), Moyes and Baker (2003), and Silverstone and Sheetz (2003). The figures of 4 percent and 11 percent in Norway indicate that Norwegian auditing has an even less pronounced role in the detection of white-collar crime than the measurements performed in the United States, for example.

Iver and Samociuk (2006) argue that fraud risks need to be recorded, monitored, and reported. Such recording includes the nature of each risk, its likelihood and consequences, the current and suggested controls, and the owner of the risk for follow-up action.

Within the extant accounting and auditing research, a great deal of attention is devoted to how the external auditor is a primary figure in detecting irregularities and corruption, and government and standard setters also stress the importance of the responsibilities of the auditing community in this respect. However, there seems to be limited faith and responsibility in the auditing function among some in this specific purpose: Only in very few cases does auditing in some form seem to be responsible for the detection, unraveling, and exposure of the offence. This opinion is backed up by the work of Drage and Olstad (2008), who analyzed the role of the auditing function in relation to both preventing and detecting white-collar crime. Although their study included a look at the perceived preventative power of the auditing function as well as actual detection of criminal offences, their findings were consistent with the abovementioned hypothesis: Many of their interviewees were skeptical regarding the auditing function having a central role in the detection of white-collar crime.

Olsen (2007) reminds us that the auditing standards that external auditors must act in compliance with also require them to uncover irregularities should they be present. However, the primary concern of the external auditor is to reduce the auditing risk (i.e., the risk that the financial statements may still contain material misstatements even after the auditor has given a positive auditor report), not the risk of irregularities. In spite of external auditors rarely being credited for the detection of financial crime, Olsen (2007) still believes that the auditing function contributes significantly to the prevention of such crime by reducing temptations and opportunities, thus corroborating the findings of Drage and Olstad (2008) on prevention.

Rendal and Westerby (2010) examined Norwegian auditors' expectations regarding their own abilities in detecting and preventing irregularities and compared these with the expectations other users of financial

information have of this same issue. Their findings indicate certain gaps in terms of how the auditor is expected to perform. Auditors themselves answer that they sometimes do not act in accordance with laws and regulations, and both auditors and users of financial information feel that the auditing function should include more than what is required today through standards and regulations, for example, pertaining to companies' internal guidelines. They also uncover unrealistic expectations regarding the extent to which the auditing function is capable of uncovering irregularities. They conclude that, to a certain extent, auditors are too reserved and aloof when it comes to their responsibilities in the prevention and detection of irregularities, and call for improvements.

Crime Signal Detection Theory

In the sample of 405 white-collar crime convicts in Norway, we identified the sources of detection as follows—journalists 25%, victims 13%, bankruptcy auditors 11%, internal auditors 11%, internal revenue employees at the Norwegian Tax Administration 6%, bank clerks 4%, external auditors 4%, police officers 2%, stock exchange employees 1%, and others 23% (see Table 10.1). Crime signal detection theory can shed light on why many white-collar crimes are detected by journalists, and relatively few are detected by internal revenue employees and others further down the list.

Signal detection theory may shed some light on why some actors discover and disclose more white-collar crime than others. Signal detection theory holds that the detection of a stimulus depends on both the intensity of the stimulus and the physical and psychological state of the individual. A detector's ability or likelihood to detect some stimulus is affected by the intensity of the stimulus (e.g., how loud a whistleblower is) and the detector's physical and psychological state (e.g., how alert hoe or she is). Perceptual sensitivity depends upon the perceptual ability of the observer to detect a signal or target or to discriminate signal from non-signal events (Szalma and Hancock 2013).

Furthermore, those detecting may have varying abilities to discern between information-bearing recognition (called pattern) and random patterns that distract from information (called noise).

Under signal detection theory, some researchers found that people more frequently and incorrectly identify negative task-related words as originally having been presented than positive words, even when they

were not present. Liu et al. (2014) found that people have lax decision criteria for negative words. In a different study, Huff and Bodner (2013) applied the signal detection approach to determine if changes in correct and false recognition following item-specific versus relational encoding were driven by a decrease in the encoding of memory information or by an increase in monitoring at test.

According to the theory, there are a number of determinants of how a person will detect a signal. In addition to signal intensity, signal alertness, and pattern recognition, there are other factors such as personal competence (including knowledge, skills, and attitude), experience, and expectations. These factors determine the threshold level. Low signal intensity, low signal alertness, and limited pattern recognition, combined with low competence, lack of experience, and lack of expectations will lead to a high threshold level, meaning that the individual will not detect white-collar crime.

The competence of private investigators is a concern. For several decades, they have strived to achieve professional status, arguing that their work is a skilled activity requiring long and in-depth training. Private policing, which is not regulated by statue in countries such as the UK, the United States, or Norway, directly challenges this premise. People are not required to undergo any form of training in order to set up as private investigators.

Signal detection theory implies that people make decisions under conditions of uncertainty. The theory assumes that the decision-maker is not a passive recipient of information, but an active decision-maker who makes difficult perceptual judgments under conditions of uncertainty. Whether a stimulus is present or absent, whether a stimulus is perceived or not perceived, whether a perceived stimulus is ignored or not, will influence the decision in terms of detecting or not detecting white-collar crime.

Gomulya and Mishina (2017: 557) introduce the term signal susceptibility due to the fact that signals may be differently susceptible to potential errors and manipulation:

> This could be due to a variety of possible reasons, including whether the signal is self- or other-reported, whether it is verifiable, or whether it is a "stock" or a "flow" signal. Self-reported signals should on average be more susceptible to manipulations by the focal signaler (i.e., the one who can benefit from a positive signal) compared to signals reported by third parties.

Given this definition, signal susceptibility can be included as an aspect of signal intensity, where signal intensity deteriorates on suspicion of errors and manipulation increases. Similarly, noise in general will reduce signal intensity. Gomulya and Mishina (2017: 555) distinguish between two sources of noise during signaling—noise from the signal itself and noise from the behavior of the signaler.

Another term introduced by Gomulya and Mishina (2017: 55) is signal reliance, where reliance on different types of signals is based on the credibility of the signaler, and "thus a similar signal is likely to have different effects for credible versus less credible" signalers. Given this perspective, signal reliance can be included as an aspect of signal alertness, where less credible signalers display lower alertness to the signal.

Gomulya and Mishina (2017) discuss pattern recognition in terms of screening theory where the recipient prioritizes among possible types of signals. The focus is on how recipients place differential value on signals that may come from different senders, such as documents, accounts, and individuals. Screening theory posits that recipients screen by focusing on signals that they believe are highly correlated with unobservable characteristics of interest.

Signal detection theory characterizes the activity of an individual's discrimination as well as psychological factors that bias his or her judgment. The theory is concerned with the individual's discriminative capacity, or sensitivity that is independent of the judgmental bias or decision criterion the individual may have had when the discrimination was made.

In Table 4.1, an attempt is made to describe the signal detection features of observers who have noticed and discover white-collar crime. Signal intensity, signal alertness, pattern recognition, and personal experience are derived from signal detection theory as characteristics of detection ability.

Pattern recognition is a matter of sense making and contextualization. Contextualization captures the ongoing process of understanding and explaining relationships between information elements.

We argue that signal intensity regarding tips to journalists normally is high, as whistleblowers tend to be upset and want to get attention. Furthermore, we suggest that signal alertness is high among journalists, as they are dependent on tips in their daily work of covering news stories. The issue of pattern recognition is not obvious for journalists, since they often present fragments on a publishing basis, rather than a complete and consistent story of events. Personal experience will vary among journalists

who may or may not have been writing about white-collar crime before, depending on the extent of specialization among journalists in the newspaper.

The idea of Table 10.4 is to apply four characteristics of signal detection theory to the detection of white-collar crime. At this stage, the items and values represent exploratory research that needs further study to be trustworthy. Both selection of characteristics as well as judgment on these characteristics for each crime detection source need multiple raters to enable inter-rater reliability to be computed.

However, this is an interesting personal experiment. For example, the police in Norway are a passive recipient of signals. Norwegian police are not under cover in financial markets and have no informants in business corporations. Therefore, police opportunity to receive signals is very limited.

Based on a sample of 369 convicted white-collar criminals in Norway from 2009 to 2015, where 97 offenders were detected by journalists and 272 were detected by others, we found some interesting differences between the two groups (see Table 10.2 earlier). In statistical terms, significant differences can be found in terms of the sum of money involved in crime, and personal finances as registered by the internal revenue service.

Table 10.4 Characteristics of stimulus in detection of white-collar crime

Rank	*Crime detection source*	*Signal intensity*	*Signal alertness*	*Pattern recognition*	*Personal experience*	*Total score*
1	Journalists	High	High	Low	Medium	9
2	Crime victims	High	Low	Medium	Low	7
3	Bankruptcy attorneys	Low	Low	Medium	Medium	6
4	Internal auditors	Low	Medium	Medium	Medium	7
5	Tax authority clerks	Low	Medium	Low	Medium	6
6	Bank employees	Low	Medium	Low	Low	5
7	External auditors	Low	Medium	Medium	Low	6
8	Police officers	Low	Medium	High	Low	7
9	Stock exchange clerks	Low	Low	Medium	Low	5
10	Other sources	–	–	–	–	–

One reason for the high signal alertness among journalists is their complete dependence on external tips to produce news stories. Journalists always need sources to which they have no access unless the sources cooperate with the media. By being polite and receptive, journalists increase the likelihood that whistleblowers and others will contact the media when they learn of potential misconduct and crime.

There seems to be a lot to learn from investigative media and their journalists. Rather than formal procedures often applied on a routine basis by auditors and internal controllers, information sources in terms of those in networks seem to be a more fruitful approach to the detection of white-collar crime.

Szalma and Hancock (2013: 1741) argue that signal detection theory has provided perhaps the most useful analytical tool for evaluating human performance in detection domains:

> The theory permits the independent evaluation of perceptual sensitivity and response bias. Perceptual sensitivity depends upon the perceptual ability of the observer to detect a signal or target or to discriminate signal from no signal events. Response bias represents the operator's decision criterion as to their propensity to say yes or no given the evidence to be evaluated.

If there is a signal and a response, then the observer makes a hit. If there is no signal, but nevertheless a response, then the observer creates a false alarm. If there is a signal, but there is no response, then the observer makes a miss. If there is no signal and no response, then the observer creates a correct rejection. However, this absolute division may not always represent an accurate depiction of the true state of the world (Szalma and Hancock 2013: 1741):

> In many instances, events are sufficiently complex and/or perceptually ambiguous that they possess ongoing properties of both signal and non-signal to varying degrees. It is important to note that this complexity does not result from low versus high signal strength (i.e., changes in the magnitude of the evidence variable) but rather a change in the nature of the evidence variable itself. That is, until absolute categorical identification has occurred (often after the fact), the signal itself may retain various non-signal properties and vice versa. Indeed, it is such categorical (and often multidimensional) blending that induces at least some of the inherent stimulus-based uncertainty in decision-making in the first place. This circumstance is especially true of real-world operational settings.

In our context of crime detection, there can be a signal of crime or no signal of crime from an event or a stimulus. However, an event or a stimulus can send both a signal of crime and at the same time a signal of no crime. The signal of crime can be stronger or weaker than the no signal. A possible range for an event or a stimulus dimension might be from zero (100% membership of the no signal category) to one (100% membership of the signal category). These endpoints correspond to the dichotomous signal detection theory. Values between zero and one reflect different degrees of membership in the two categories (Szalma and Hancock 2013: 1742):

> A signal value of .5 represents maximal uncertainty in the category membership status of the stimulus itself because a stimulus with a signal value of .5 has properties of both a non-signal and a signal to an equal degree. Implicit in this model is the assumption that signal uncertainty exists not only within the observer but also in the state-of-the-world itself.

Szalma and Hancock (2013) suggest a fuzzy signal detection theory where stimuli do not fall into discrete, mutually exclusive categories. The fuzzy theory allows events to simultaneously be in more than one category (e.g., both signal and non-signal). In our context of crime detection, stimuli may be perceived in terms of signal probability, where a stimulus can be perceived as probably a signal or probably not a signal.

Crime signal detection is not only an individual issue. Team cognition may influence individual signal detection. Team cognition, defined as the cognitive activity that occurs within a team, is one of the key factors enhancing team performance. When team members hold convergent perspectives and knowledge, developing team cognition can be a success. On the other hand, breakdown of team cognition concerning the situation can lead to failures in coordination and cause lack of signal detection.

Crime signal detection ability and skill link to general investigative professionalism that includes the ability to collect and evaluate information, the ability to make an analysis, the ability to have specific knowledge of the field, the skill of being careful and meticulous, the skill of looking at different angels, the ability to be intelligent and use intelligence, and the ability to perform a professional inquiry.

Bond (2008) studied signal detection in deception. They carried out experiments where experts had to discriminate between offenders and non-offenders. They specifically investigated law enforcement practitioners'

expertise in detecting deception in paroled felons. In signal detection analysis, experts showed high discrimination and did not evidence biased responding. The experts exploited non-verbal cues to make fast, accurate decisions.

Lack of Crime Signal Detection

Signal detection theory provides a general framework to describe and study decisions that are made in uncertain and ambiguous situations. Without sufficient information in a noisy environment with many impressions not linked to any particular signal, it is indeed difficult to detect a crime signal.

External auditors receive an average score of six in Table 3.1. The signal intensity is often low, auditors' signal alertness is medium, auditors' pattern recognition is medium, and their personal experience is often low.

Hestnes (2017) studied a case in Norway to discuss the lack of crime signal detection by auditors. The case concerns a company where the CFO was convicted and sent to prison for embezzlement. The auditor never detected the embezzlement, although it went on for several years. The case is used in Hestnes' book twice, since the detection of embezzlement by others caused an internal investigation. The CFO is discussed as an entrepreneur in white-collar crime, and he is described also in the crime investigation at Hadeland Broadband Network.

Hestnes (2017) conducted semi-structured interviews with a number of people who knew the embezzlement case very well. The results of the case study correspond to crime signal detection theory on the grounds that embezzlement in the company was not detected. Lack of detection was due to the auditor's low score on the four factors in the theory. The findings indicate that the auditor's lack of signal alertness in particular combined with low signal intensity from the audit context was the main reason why the crime was not revealed. Low signal intensity seems to be a result of a financial manager's independent position and the company's ineffective control environment.

In order to be able to detect fraud, the revealing party must be able both physically and mentally to detect signals of misconduct. Signal alertness is a unique readiness to recognize misconduct opportunities where they exist. Auditors are obliged to be aware that fraud may occur, while audit assignments may not necessarily be specifically aimed at detecting fraud unless there are incidents creating suspicion during the auditing

process. International auditing standards place great emphasis on the auditor being able to show professional skepticism. The auditing standard ISA 200, paragraph A20, states that professional skepticism increases the auditor's vigilance to identify contradictory audit evidence, "unreliable documentation and responses to requests", "circumstances that may indicate fraud", and other circumstances that require "audit procedures beyond those required of the ISAs". Lack of professional skepticism makes the auditor less aware of abnormal conditions and can cause the auditor to "make false assumptions" for the selection of "audit procedures and evaluation of their results".

However, the auditor will normally not be the one to receive direct signals concerning the occurrence of fraud. White-collar offenders strive to conceal their actions, and most fraud will be well hidden and difficult to detect. In the CFO case, the problem is even greater for the auditor, since the CFO is in a role that typically provides the auditor with access to accounting figures. Therefore, the auditor's signal alertness will be a result of how much the auditor's focus is on risk assessment actions associated with the audit, and also what risk signals the auditor receives through documentation from and communication with a company's board, management, and employees.

A distinction in auditing has been made between alert and non-alert individuals. An alert individual is defined as a person who is able to perceive that characteristics in the environment change, and that the appropriate action must be adapted to the actual situation. A non-alert person fails to perceive or ignores altered signals from the environment. That way, a non-alert person's actions will no longer be appropriate and effective as they used to be.

It seems that an audit becomes less effective in situations where the same auditor has been responsible for several consecutive years of audit. Alertness deteriorates as no deviance occurs. By using the theory of entrepreneurial alertness on the role of the auditor in such situations, it may be argued that the auditor, over time, will gradually lean towards becoming a non-alert individual. This conception is supported by previous research that determines why the auditor does not detect fraud.

A distinction can also be made between formal audit and substance audit. Formalities and systems are checked in a formal audit, while transactions and actors are checked in a substance audit. An argument that the auditor is trained to conduct formal audit is that the auditor's main objective is to obtain confirmation that the accounts are properly

prepared. The auditor develops an opinion concerning the accuracy of accounts, and thus, in lesser detail, looks for errors. This approach may limit and even exclude substance control. The auditor may fall in to the confirmation trap by simply checking that the accounts are in accordance with laws and regulations. The auditor neglects to carry out sufficiently detailed tests for factors that may cause red flags to appear. One reason for this neglect might be an auditor's limited cognitive capacity, which is dependent on intelligence and creativity to detect new signals.

References

Albrecht, C. C., Albrecht, W. S., & Dunn, J. G. (2001). Can Auditors Detect Fraud: A Review of the Research Evidence. *Journal of Forensic Accounting, II*, 1–12.

Beasley, M. S. (2003). SAS No. 99: A New Look at Auditor Detection of Fraud. *Journal of Forensic Accounting, IV*, 1–20.

Bond, G. D. (2008). Deception Detection Expertise. *Law and Human Behavior, 32*, 339–351.

Campbell, F. (1997). Journalistic Construction of News: Information Gathering. *New Library World, 98*(2), 60–64.

Drage, K., & Olstad, T. (2008). *Ekstern revisor og økonomisk kriminalitet – En analyse av revisors ansvar og brukernes forventninger* [External Auditor and Financial Crime – An Analysis of Auditor Responsibility and User Expectations]. Oslo: BI Norwegian School of Management.

Farrell, B. R., & Healy, P. (2000). White Collar Crime: A Profile of the Perpetrator and an Evaluation of the Responsibilities for Its Prevention and Detection. *Journal of Forensic Accounting, I*, 17–34.

Gomulya, D., & Mishina, Y. (2017). Signaler Credibility, Signal Susceptibility, and Relative Reliance on Signals: How Stakeholders Change Their Evaluative Processes After Violation of Expectations and Rehabilitative Efforts. *Academy of Management Journal, 60*(2), 554–583.

Hestnes, M. (2017). *Hvorfor avdekket ikke revisor underslaget i Hadeland og Ringerike Bredbånd?* [Why Did the Auditor Not Detect Embezzlement at Hadeland and Ringerike Broadband?] (Master of Science Thesis). Oslo: BI Norwegian Business School.

Huff, M. J., & Bodner, G. E. (2013). When Does Memory Monitoring Succeed Versus Fail? Comparing Item-Specific and Relational Encoding in the DRM Paradigm. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 39*(4), 1246–1256.

Iver, N., & Samociuk, M. (2006). *Fraud and Corruption: Prevention and Detection*. Farnham: Gower Publishing.

Jones, P. (2004). *Fraud and Corruption in Public Services: A Guide to Risk and Prevention*. Aldershot: Gower Publishing.

Liu, G., et al. (2014). Lax Decision Criteria Lead to Negativity Bias: Evidence from the Emotional Stroop Task. *Psychological Reports, 114*(3), 896–912. http://journals.sagepub.com/doi/10.2466/28.04.PR0.114k29w0

Moyes, G. D., & Baker, C. R. (2003). Auditor's Beliefs About the Fraud Detection Effectiveness of Standard Audit Procedures. *Journal of Forensic Accounting, IV*, 199–216.

Olsen, A. B. (2007). *Økonomisk kriminalitet: avdekking, gransking og forebygging* [Financial Crime: Detection, Investigation and Prevention]. Oslo: Universitetsforlaget.

Øvrebø, T. (2004). *Nyhetsproduksjon – kjønn og makt. En studie av endring i Dagsavisen 2000–2003* [News Production – Sex and Power. A Study of Change in Dagsavisen (Norwegian Daily Newspaper) 2000–2003]. Hovedoppgave i Medievitenskap (Master Thesis in Media Science). Universitetet i Oslo (University of Oslo).

Proba. (2011). *Misbruk av sykepengeordningen i folketrygden* [Abuse of Sick Pay Scheme in National Insurance]. Oslo: Proba samfunnsanalyse.

Proba. (2013). *Trygdesvindel i Norge: En kartlegging av fem stønadsordninger* [Social Security Fraud in Norway: A Survey of Five Support Areas]. Oslo: Proba samfunnsanalyse.

Rendal, S., & Westerby, T. (2010). *Hvilke forventninger har revisor i forhold til brukere av finansiell informasjon når det gjelder revisors plikter til forebygging og avdekking av misligheter?* [What Expectations Does the Auditor Have in Relation to Users av Financial Information Concerning Auditor Responsibility for Prevention and Detection of Misconduct?]. [S. Rendal], Oslo.

Silverstone, H., & Sheetz, M. (2003). *Forensic Accounting and Fraud Investigation for Non-experts*. Hoboken: Wiley.

Szalma, J. L., & Hancock, P. A. (2013). A Signal Improvement to Signal Detection Analysis: Fuzzy SDT on the ROCs. *Journal of Experimental Psychology: Human Perception and Performance, 39*(6), 1741–1762.

Terum, L. I., Torsvik, G., & Øverbye, E. (2017). Discrimination Against Ethnic Minorities in Activation Programme? Evidence from a Vignette Experiment. *Journal of Social Policy*, 1–18. https://doi.org/10.1017/S0047279417000113. Published online: 13 March 2017.