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Contribution of Forensic Accounting to Corporate Governance: An Exploratory Study of an Asian Country

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Abstract: The recent accounting scandals (viz., Enron, WorldCom, Madoff, Satyam, etc.) have induced a crisis of confidence in financial reporting practice and effectiveness of Corporate Governance (CG) mechanisms. Indeed, Forensic Accounting (FA) integrates accounting, auditing and investigative skills to conduct investigations in variety of fraud cases. Thus, an increasing number of researchers are finding that 'poor' CG is a leading factor in dismal performance, manipulated financial reports and unhappy stakeholders. Some leading corporations and regulatory bodies however are trying their best efforts to analyze and correct the existing loopholes in the reporting system. In the 21st century, the Forensic Chartered Accountants (FCAs) are in great demand and "FA is listed among the top-20 careers of the future". During 2011-12, a questionnaire-based survey was conducted in the National Capital Region of India using a sample size of 120 practicing chartered accountants, accounting academics and potential users of FA services. In fact, this study is a 'preliminary' investigation of the necessary skills, education and training requirements for the professional community. The results of this 'exploratory' study with few minor differences, indicate that potential practitioners, academics and users agree that "critical thinking, written and oral communication, legal knowledge, auditing skills, deductive analysis, investigative flexibility, analytical proficiency and unstructured problem-solving are the most important skills required for the FCAs". Moreover, we found that all of the skills investigated in this study are 'potentially' important for the FCAs which the educators at the universities should use as an overall guide while designing their FA curriculum".

Key words: Forensic accounting, forensic chartered accountants, corporate governance asian country, financial reporting, regulatory bodies

INTRODUCTION

Recently, Forensic Accounting (henceforth, FA) has come into limelight due to rapid increase in financial frauds (or white-collar) crimes. Simply stated, FA (also called investigative accounting or fraud audit) is a merger of "forensic" science and "accounting". According to Crumbley, "Forensic means which is suitable for use in a Court of law and it is to that standard and potential outcome that Forensic Chartered Accountants (henceforth, FCAs) generally have to work". Thus, FA encompasses litigation support, investigation and dispute resolution and therefore is the intersection between accounting, investigation and the law. The job of FCAs is to catch the perpetrators of the estimated $600 billion theft and fraud occurring in the US companies every year. This includes tracing money laundering and identity theft activities as well as tax evasions. The sudden increase in the 1990's of white-collar crime, the complexity of technology and the September 11 terrorist attacks which left many business facing financial ruin after losing almost all their accounting records has fuelled the demand for FA services. Undoubtedly, the FCAs have been involved in bringing life back into New York based businesses, after September 11 by compiling basic records so as to file insurance claims. They have also been involved in tracing the financing for the attacks finding from where the terrorists got the money? Worldwide, we consider Sherlock Holmes to be the first forensic accountant. He does not carry guns or engage in car chases but they are among this century's greatest' crime-fighters. The "US News and World Report" listed these financial watchdogs as one of top eight "careers to count on". In nutshell, the FCAs are "blood-hound of book-keeping".

As Christensen *et al*. (2005) observed, "In the USA, the Sarbanes-Oxley Act (SOA) of 2002 has forced top management to certify that financial statements are free of fraud and material misstatement". Similar is the situation prevalent in India as per clause 49 of the BSE/NSE listing requirements. This may mean that simply using an auditor is not enough and the inclusion of a FCA on the audit team is also required. Increased fraud and illegal activity with all the SEC listed corporations means increased

pressure has been put on the auditor to meet the requirements of the SOA. Many accounting firms recently have expanded their professional consulting services to include "forensics and fraud". Recent corporate accounting scandals and the resultant outcry for transparency and honesty in reporting, therefore have given rise to two disparate yet logical outcomes (Bhasin and Manama, 2008). First, FA skills have become very crucial in untangling the complicated accounting maneuvers' that have obfuscated financial statements. Second, public demand for change and subsequent regulatory action has transformed Corporate Governance (henceforth, CG) scenario. Therefore, many senior-level company officers and directors are under the ethical and legal scrutiny. In fact, both these trends have the common goal of addressing the investors' concerns about the transparent financial reporting system. The failure of the corporate communication structure has also made the financial community realize that there is a great need for skilled professionals (FCAs) that can identify, expose and prevent structural weaknesses in three key areas: poor CG, flawed internal controls and fraudulent financial statements. Therefore, FA skills are becoming increasingly relied upon within a corporate reporting system that emphasizes its accountability and responsibility to stakeholders.

Over the past few years, these issues has been in the spotlight and FCAs have been asked to question the 'traditional' view, i.e., accounting is about assessing whether financial statements meet Generally Accepted Accounting Practices (GAAP) as outlined by their professional bodies (Hassan and Morteza, 2012). This has been shown in some cases including Enron, WorldCom and Satyam to produce financial statements that may be enhanced to show a 'rosy' picture to investors (Lehman and Okcabol, 2005). Accountants, therefore, need to make sure that their interpretation of GAAP ensures "a true and honest representation of accounting data." Debates the world over about what is 'true and fair' according to GAAP continue and many professional bodies have chosen to adopt a more regulated approach. As Rezaee (2005) stated, "Many groups in society are expecting FCAs to adopt a more active role in providing assurance regarding reliable financial reporting, responsible CG and detection and prevention of frauds. Perhaps, the FCAs may have been able to track these complex puzzles before the fallout from these events and highlighted them to investors". Thus, FCAs may be able to answer such questions as: can the reliability of auditors and the quality of the audit be believed? FA was a growing specialty before Enron, WorldCom, Satyam and Sarbanes-Oxley; now, it is really hot.

The recent accounting scandals across the world have induced a crisis of confidence in financial reporting practice and effectiveness of CG mechanisms. No doubt, fraudulent financial reporting can have significant consequences for the organization and its stakeholders as well as for public-confidence in capital markets. For instance, according to COSO Report (2010), "Periodic high-profile cases of fraudulent financial reporting raise concerns about the credibility of the financial reporting process and call into question the roles of management, auditors, regulators and analysts, among others". According to a study of organizations world-wide, 30% of companies were victims of an economic crime (fraud) in the last year (Murphy and Dacin, 2011). From Enron, WorldCom, Madoff and Satyam, it appears that corporate accounting fraud is a major problem that is increasing, both in its frequency and severity. According to the Association of Certified Fraud Examiners', 'Report to the Nations,' "the cost of fraud to the US organizations is extensive 5% of annual revenues, despite increased emphasis on anti-fraud controls and recent legislation to combat fraud". Indeed, the ACFE survey found that whistle-blowing is the single most common method of fraud detection (Robinson *et al*., 2012). Although, it is generally accepted that the SOA has improved the CG scenario and decreased the incidence of fraud, recent studies and surveys indicate that investors and management continue to have concerns about financial statement fraud.

Literature review: The literature on FA and its adoption in accounting and finance curriculum is rather limited and they are mostly US-centric. However, our objective in this section is to highlight the core findings in the few relevant current studies, rather than make an extensive examination of tangential issues to FA and its adoption in accounting and finance curriculum. Joshi ascribed the origination of FA to "Kutilya," the first economist to openly recognize the need for the FCA, whom he said, mentioned 40 ways of embezzlement centuries ago. He, however, stated that the term "FA was coined by Peloubet in 1946 and defined FA as "the application of specialized knowledge and specific skill to stumble up on the evidence of economic transactions".

Crumbley wrote on same, when he stated that a form of FA can be traced back to an 1817 court decision. He stated that a "young Scottish accountant issued a circular advertising his expertise in arbitration support in 1824" but that Peloubet was probably the first to publish the phrase FA. Simply stated, FA (also called investigative accounting or fraud audit) is a merger of "forensic science and accounting". Forensic science, according to

Singleton "may be defined as application of the laws of nature to the laws of man". He refers to forensic scientists as examiners and interpreters of evidence and facts in legal cases that also offers expert opinions regarding their findings in court of law. The science in question here is 'accounting' science, meaning that the examination and interpretation will be of economic information. Similarly, Ozkul and Pamukcu (2012) have defined FA as "the integration of accounting, auditing and investigative skills". Simply put, FA is accounting that is suitable for legal review offering the highest-level of assurance and including the now generally accepted connotation of having been arrived at in a scientific fashion.

However, Gray (2011) stated that FA involves the application of accounting concepts and techniques to legal problems. It demands reporting where the accountability of the fraud is established and the report is considered as evidence in the court of law or in the administrative proceeding. It provides an accounting analysis that is suitable to the court which will form the basis of discussion, debate and ultimately dispute resolution. This means that FA is a field of specialization that has to do with provision of information that is meant to be used as evidence especially for legal purposes. The persons practicing in this field (i.e., FCAs) investigate and document financial fraud and white-collar crimes such as embezzlement and investigate allegations of fraud, estimates losses damages and assets and analyses complex financial transaction. They provide those services for corporation, attorneys, criminal investigators and the government. Their engagements are usually geared towards finding where money went, how it got there and who was responsible? They are trained to look beyond the numbers and deal with business reality of the situation (Efiong, 2012; Koh *et al*., 2009). Investigative and FA engagements are those that "require the application of professional accounting skills, investigative skills and an investigative mindset and involve disputes or anticipated disputes or where there are risks, concerns or allegations of fraud or other illegal or unethical conduct".

In brief, FA is more than counting numbers; it involves solving complex financial puzzles, particularly in fraud, insurance, disputes and providing legal evidence for presentation in a legal forum (Houck *et al*., 2006). Activities include investigations of business information and data. These investigations can be to establish employee fraud, provide litigation support such as substantiation of insurance claims, analysis of facts, formulation of questions and examination of accounting systems and also business valuations. Techniques can include data reconstruction, data mining, horizontal/vertical analysis, variance/ratio analysis, cash flow analysis and comparison to other operating information (including industry standards) (Latshaw, 2003). By and large, the CAs are already trained in many of the skills required for such tasks but needs some additional specialized skills to the skills of a traditionally trained accountant.

Poor corporate governance and accounting failures: Simply stated, "Corporate Governance (CG) is the system by which businesses are directed and controlled. It provides a principled process and structure through which the objectives of the corporation, the means of attaining the objectives and systems of monitoring performance are set". Indeed, CG is a set of accepted principles by management of the inalienable rights of the shareholders as a true owner of the corporation and of their own role as trustees on behalf of the shareholders (Bhasin and Manama, 2008). Thus, accountability, transparency, fairness and disclosure are the four "pillars" of the modern corporate regulatory system.

The concept of CG first came into vogue in the 1970s in the United States. Within 25 years, CG had become the subject of debate worldwide by academics, regulators, executives and investors. Moreover, Enofe have shown that an average accountant/auditor does not know the symptoms of fraud and that most frauds and embezzlements are not discovered in the course of financial audit but through "whistle blowing, sudden discovery that something is missing and the use of FA investigative techniques". Similarly, Klein (2015) stated that "in recent times both in the public and private sector of the economy, series of frauds have been committed under the watchful eye of the internal auditors of the organization. CPA/FCAs can better manage fraud risks by communicating and working with clients on fraud prevention: robust warning letters and advisories to clients about the risks of fraud and how to guard against it are therefore of great benefit when needed". The recent financial crisis has been a trigger for regulators, policy-makers, investors and others to consider what improvements could be made to the corporate reporting system.

The corporate scandals of the last few years came as a shock not just because of the enormity of failures but also because of the discovery that "questionable accounting practice was far more insidious and widespread than previously envisioned". Thus, a definite link between these accounting failures and poor CG is beginning to emerge. In this context, Badawi and Fitzsimons (2002) have very aptly observed: "Adelphia,

for example was given a very low 24% rating by Institutional Shareholder Services on its CG score. In Europe, Parmalat and Royal Ahold were ranked in the bottom quartile of companies in the index provided by Governance Metrics International". Similarly, the Corporate Library had issued early failure warnings in respect of both WorldCom and Enron. Nowadays an increasing number of researchers are finding that "poor CG is a leading factor in poor performance, manipulated financial reports and unhappy stakeholders". Thus, leading corporations and regulatory bodies are currently trying to analyze and correct any existing defects in their reporting system.

According to Ramaswamy (2005), "The interest of investors and other stakeholders are usually protected by a three-tier security system. At the top-level is the company's "CG Code" which is directed toward enforcing company policies, achieving company objectives, monitoring company performance and ensuring adequate disclosure of the company's activities. At the other end are the "reporting system" which is regulated by various public and private institutions such as the Securities and Exchange Commission (SEC), the Public Company Accounting Oversight Board (PCAOB) and Financial Accounting Standards Board (FASB), Securities and Exchange Board of India (SEBI), etc. These regulatory agencies require all the public-listed companies to follow various accounting and disclosure standards such as Generally Accepted Accounting Principles (GAAP) and their auditors to audit as per Statement on Auditing Standards (SAS) like independence, ethical and quality control standards". Linking the two extremes however is a company's system of internal controls which provides reasonable 'assurance' on the effectiveness and efficiency of operations, the 'reliability' of financial reporting and 'compliance' with applicable laws and regulations. This system, however, seems to have been inadequate in many companies. As corporations scramble to realign their interests with those of their stakeholders, the following three main areas of weaknesses are emerging: lack of a well-developed and implemented policy of corporate governance lack of honesty and transparency in reporting an inefficient and ineffective system of internal control.

Now, companies are facing increasing levels of legal regulatory and economic reporting requirements because of the new regulations under the SOA. As Telberg stated: "Companies are spending millions of dollars examining their existing systems and adopting or improving their CG and internal controls to meet the standards set by SOA sections 403 and 404." Undoubtedly, there will be lot of growth opportunities for various professionals to contribute to improve the corporate world. This could be the key to preventing future meltdowns and to guaranteeing the two important qualities of corporate reporting, namely, transparency and honesty.

Forensic accounting provides the connecting link: Initially, FCAs were used by the government agencies (such as the CIA, the FBI and the IRS) to uncover and investigate leading frauds. They became financial detectives; independent experts employed by management to uncover fraudulent financial reporting and misappropriated assets. In the current reporting environment, FCAs are in great demand for their accounting, auditing, legal and investigative skills. They can play a vital role in coordinating company efforts to achieve a cohesive policy of ethical behavior within an organization.

The definition of FA is changing in response to the growing needs of corporations. Bologna and Lindquist had defined FA as "the application of financial skills and an investigative mentality to unresolved issues, conducted within the context of rules of evidence. As an emerging discipline, it encompasses financial expertise, fraud knowledge and a sound knowledge and understanding of business reality and the working of the legal system". According to the definition developed by the AICPA's Forensic and Litigation Services Committee, "FA may involve the application of special skills in accounting, auditing, finance, quantitative methods, the law and research. It also requires investigative skills to collect, analyze and evaluate financial evidence as well as the ability to interpret and communicate findings. Thus, FA encompasses litigation support, investigation and dispute resolution and therefore is the intersection between accounting, investigation and the law".

FA includes the use of accounting, auditing and investigative skills to assist in legal matters. According to Golden, "It consists of two major components: litigation services that recognize the role of an accountant as an expert consultant and investigative services that use FCAs skills and may require possible courtroom testimony". This implies that the FCAs should be skilled not only in financial accounting but also in internal control systems, the law, other institutional requirements, investigative proficiency and interpersonal skills. Corporations can rely on these skills for developing a consistent system of CG, disseminating such information within and outside the company, ensuring that governance policies and objectives are interwoven into the internal control system, setting up fraud prevention systems and investigating any existing fraud.

Core knowledge and personal skills required: The FCAs are expected to be a 'specialist' in accounting and financial systems. Yet as companies continue to grow in size and complexity, uncovering fraud requires a FCA to become 'proficient' in an ever-increasing number of professional skills and competencies. Here are some of the broad areas of useful expertise for the FCAs:

- An in-depth knowledge of financial statements and the ability to critically analyze them. These skills help FCAs to uncover abnormal patterns in accounting information and recognize their source
- A thorough understanding of fraud schemes including but not limited to asset misappropriations, money laundering, bribery and corruption
- The ability to comprehend the internal control systems of corporations and to set up a control system that assesses risks, achieves management objectives, inform employees of their control responsibilities and monitors the quality of the program so that corrections and changes can be made
- Proficiency in computer and knowledge of network systems. These skills help FCAs to conduct investigations in the area of e-Banking and computerized accounting systems
- Knowledge of psychology in order to understand the impulses behind criminal behavior and to set up fraud prevention programs that motivate and encourage employees
- Interpersonal and communication skills which aid in disseminating information about the company's ethical policies and help FCAs to conduct interviews and obtain crucial, needed information
- Thorough knowledge of company's governance policies and the laws that regulate these policies. Command of criminal and civil law as well as of the legal system and court procedures

With this background, the FCAs are distinctly positioned to explore the design of CG systems, the role of the financial reporting system in CG, the effect of the governance board on employee and managerial behavior and the efficacy of the internal control systems.

So, what personal skills are required to become a FCA? In addition to the specialized knowledge about the techniques of finding out the frauds, one needs patience and analytical mindset (Bhasin). One has to look beyond the numbers and grasp the substance of the situation. It is basically the research of the intelligent CAs. There is a need for the same basic accounting skills that it takes to become a good auditor plus the ability to pay attention to the smallest detail, analyze data thoroughly, think creatively, possess common business sense be proficient with a computer and have excellent communication skills. A "sixth" sense that can be used to reconstruct details of past accounting transactions is also beneficial. A photographic memory helps when trying to visualize and reconstruct these past events. The FCAs also needs the ability to maintain his composure when detailing these events on the witness stand. Finally, the FCAs should be insensitive to personal attacks on his professional credibility. A fraud accountant (forensic accountant are sometimes called) should also observe and listen carefully. By this you can improve your ability to detect lies whether they involve fraud or not. This is so because "not all liars are fraudsters but all fraudsters are liars" (Wells, 2004).

According to Mayur Joshi, an Indian forensic expert, "The traits of the FCAs could be compared to well-baked Pizza. The base of FA is accounting knowledge. Size and the extent of baking decide the quality of the Pizza. A middle layer is a dispersed knowledge of auditing, internal controls, risk assessment and fraud detection. It is like the spread of the cheese in Pizza. The toppings of this Pizza are a basic understanding of the legal environment. The legal environment is essential in order to support the litigations. The Cherry on the toppings of the Pizza is a strong set of communication skills both written and oral. It is just like the beautification part. Perfect combination of the Pizza base, Cheese spread and good toppings make the pizza delicious and Forensic Auditor the perfect. It is a perfect combination that will be in demand for as long as human nature exists".

In addition to these personal characteristics, CAs must meet several additional requirements to gain the position of FCAs, say a certification, acknowledging his competence. One can learn FA by obtaining a diploma given by the Association of Certified Fraud Examiners (ACFE) in the US. The Indian chapter of ACFE offers the course based on the white-collared crimes prevalent in US, based on their laws. However, it is most unfortunate that till now there is no formal body that provides formal education of the frauds in India. We can follow the good example shown by the Canada (Rosen, 2007). "The Canadian Institute of Chartered Accountants (CICA) had taken initiative in this direction and issued guidelines and pronouncements regarding investigative accounting". Besides the formal certificate, one can deepen his knowledge and sharpen his skills in FA by undergoing training under experienced FCA, participating in various international conferences, reading relevant journals, books and other literature on FA.

To combat the frauds effectively, therefore, one needs the active support of government investigating agencies at every stage. There are three-four such agencies in India which are dedicated to the mission of combating frauds. Serious Fraud Office looks into violations of Income Tax, FEMA, RBI Act, etc., CBI (Economic Office Wing) deals with big financial frauds; Central Vigilance Commission deals with corruption. These are some of the major government agencies that combat frauds of different types. Unfortunately, there is no specialized FA education provided by any of the Universities in the country (Bhasin and Manama, 2008; Bhasin, 2013a, b). "Fraud Today" is the next generation of the fraud examinations in India. They plan to develop and market software and develop resources for various world-class universities. Recently, TCS has also come out with software to combat money laundering and Subex Systems have designed software to combat the telecom frauds. Thus, combating the frauds with software has started picking up in India with few big companies like ACL and IDEA, joining the race.

Contributions of the Forensic Chartered Accountants (FCAs) to CG: Companies need a centralized program and an established system to measure and monitor internal controls effectiveness and the alignment between CG, internal control and external reporting activities. Leading companies are setting up "Governance Officers or Governance Committees" to meet the demand for corporate integrity. The governance committee must be active in every area of corporate activity to ensure that the company is operating as a synergistic whole. According to Ramaswamy (2005), "As part of the CG Committee, the FCAs can make significant contributions in each of the following areas:

Corporate governance: With a strong background knowledge of the legal and institutional requirements of CG systems, the FCAs can help to formulate and establish a comprehensive governance policy that "ensures an appropriate mix of management and independent directors on the board; sets out the appropriate responsibilities of the board and the audit committees has a fair allocation of power between owners, management and the board and ensures there is a company code of ethics for employees and management". Ethical behavior, thus is reinforced when top management shows, through its own actions that questionable behavior will not be tolerated.

Preventing fraud: The FCAs understand that the best way to prevent fraud is to establish an efficient control system that encompasses "a good control environment determined by management's philosophy of ethical behavior and strong CG policies; a superior accounting system that ensures the proper recording, classification and reporting of all relevant transactions and strong procedural controls that provide for safeguarding of assets, proper authorizations, audit mechanisms and proper documentation".

Creating a positive work environment: A good fraud prevention program "accompanies a positive work environment where highly motivated employees are not tempted to abuse their responsibilities". The FCAs can ensure that CG policies are formulated to avoid high-risk environments where management is apathetic, pay is inadequate or too high there is a serious lack of proper training and compliance or there are unreasonable profit and budget goals. It is also necessary to have well-defined hiring policies that result in honest, well-qualified employees.

Establishing effective lines of communication: Communication is a key element in ensuring that employees and other stakeholders are aware of their rights and responsibilities. The COSO Report (2010) has very categorically stated: "Effective communication must flow not just from the top to lower levels but also across employee lines of responsibility". The FCAs can, no doubt, support the dissemination of the required information about governance and ethics policies to interested parties within and outside the organization. Adequate reporting is also necessary to meet the compliance requirements of the SEC and all the leading stock markets.

Vigilant oversight: System needs to be constantly monitored and evaluated to make sure that it is functioning well. The FCAs can monitor not only the compliance at the top levels of corporate power but also management procedures and employee activity. Information gathered as a result of the monitoring can be used to readjust and reformulate governance, ethics and control policies.

Establishing consequences: Fraud deterrence should also include an expectation of punishment. The FCAs can help in creating policies that clearly state the company's intent to take action against any criminal activities and that such action will apply to all levels of employees.

Fraud investigations: The FCAs can ensure the integrity of financial statements by actively investigating for fraud, identifying areas of risk and associated fraud symptoms,

pursuing each anomaly aggressively and delving into the minute's details of accounting and financial anomalies (Rezaee *et al*., 2006). By helping companies to prevent and detect fraud, therefore, the FCAs role can easily evolve into a key component in the CG System.

All of the larger accounting firms as well as many medium-sized and boutique firms have 'specialist' FA departments. Within these groups, there may be further sub-specializations: some FCAs may, for example, just specialize in insurance claims, personal injury claims, fraud detection, construction or royalty audits. Nearly 40% of the top 100 US accounting firms are expanding their forensic and fraud services. If this data is an indicator of the Indian scenario then the day is not far away when FCAs practice will contribute significantly to the total revenue of the Indian CAs firms. In short, these services are in great demand and rendered at a premium in current context of flourishing business and rising instances of frauds and litigations.

MATERIALS AND METHODS

Objective of study and research methodology used: Financial reporting practice can be developed by reference to a particular setting in which it is embedded. Therefore, 'qualitative' research could be seen useful to explore and describe fraudulent financial reporting practice. The 'primary' objective of this study is "to assess the necessary skills required by Forensic Chartered Accountants (FCAs) in India and make a case for the development of a standardized curriculum for the study of FA as a course in the Universities". However, two more specific objectives were:

- To determine whether the skills required by the FCAs in the developed countries significantly differs from the expectations of clients and accountants in India
- To establish the need for incorporating FA courses in the academic curriculum of the leading Indian/other universities

Accordingly, during 2011-12, we conducted a survey of three States in the National Capital Region (NCR viz., Delhi, Gurgaon and Ghaziabad) of India using a random sample of 120 practicing CAs, accounting academics and users/potential users of FA services. This study classified lawyers and anti-graft agencies personnel as the primary users of FA services. The questionnaire was divided into three sections and it was sent out and retrieved as follows: 120 questionnaires were given hand-to-hand by trained assistants to members of the stakeholders' groups. The 40 for each group of professional accountants, accounting academics and lawyers/anti-graft agencies personnel. However, only 70 questionnaires were finally retrieved with 65 found to be reasonably complete in most respects.

A total of 65 respondents fully-completed the survey instrument of them 20 (31%) were the CAs/FCAs, 20 (31%) accounting academics and 25 (38%) were users of FA services. The overall response rate was 54% which is little above the average score. The demographic profile of the sample is as follows: approximately, 70% of the sample comprised of men, 62% were over the age of 40 years, 93% were having undergraduate/masters' education, 77% were having experience with business forensics, 88% had experience with accounting and 92% had experience with auditing, respectively.

However, we prepared and pre-tested our questionnaire before sending it out to all the sampled respondents. The questionnaire was structured into three sections. In section A, first-six questions attempted to map the biographical profile of the respondents such as primary profession, gender, education, experience, professional qualification/license and involvement with FA services. Here, one question specifically asked the participants to "identify, at least, five core skills (out of 19 skill options) that FCAs needs to possess and rank them on a 5-point Likert-type scale, ranging from 4 (strongly agree) to 0 (strongly disagree)". Similarly, in section B, 9 skill-related broad statements were presented being the important skills of FCAs. As suggested by Digabriele (2008), "The nine skills required for the FCAs to be rated were: deductive analysis, critical thinking, unstructured problem-solving, investigative flexibility, analytical proficiency oral and written communication, specific legal knowledge and composure. You are expected to answer them on a 5-point Likert-type scale, ranging from 4 (strongly agree), 3 (Agree), 2 (Neutral), 1 (disagree) to 0 (strongly disagree)". Moreover, in section C, we asked the respondents to answer some questions regarding basic education and career-paths of FCAs their likely demand in the future next 5, 10 and 20 years and need to know computer-based forensic techniques and software tools". The scales were anchored at each end with the descriptors "extremely unimportant" to "extremely important", respectively. The responses from the above stated aspects of the survey instrument enabled us to assess the participants view on the 'core' skills of FCAs, the extent of differences in views about these skills between current and previous research and general trends about FA education, career-path, demand-supply scenario and computer-proficiency.

Some universities in India are considering including FA courses in their curriculum. This evolution has unearthed an absence regarding the significant skill-set outcome that should accompany FA education. One of

the objectives of this study is to examine the necessary skills that will be required by would-be FA's for the purpose of recommending them to Indian universities for possible inclusion in their syllabi. The current study complements the two prior-studies undertaken by Razaee *et al.* (2004) by surveying "forensic professionals for their perceptions of the necessary skills and characteristics for FA as well as the education requirements".

RESULTS AND DISCUSSION

As stated earlier, our questionnaire-based survey was divided into three sections. In section A, the list of choices provided to the participants was developed through an extensive review of the relevant academic and professional literature, consultation with FCAs and users of forensic services. Based on the outcome of the current study, descriptive statistics for the 19 areas of skill competency including the overall means, standard deviations and ranks are shown in Table 1. It should be noted here that the "skills with the high means and low standard deviations are the most important skills required for FCAs while the skills with low means but high standard deviations are the least important skills required to be FCAs". Based on the findings of the present study, we can conclude as follows: "The skill competency items rated as the most important (with rank of 1 and 2) were effective written communication (M = 15.5, SD = 5.1), auditing skills and oral communication (M = 14.75, SD = 6.7 and 5.2). Research skills (M = 13.75, SD = 6.8), tell the story and investigative ability (M = 13.5 and 13.25, SD = 4.4 and 3.6) take the second position (with rank of 3) in terms of importance. The items rated as least important (with low ranks) were: understanding the goal of a case (M = 6.5, SD = 2.9), solve unstructured problems (M = 10, SD = 3.6) and synthesize results of discovery and analysis (M = 10, SD = 5.4), respectively".

Table 1: Descriptive statistics for skill competency required for forensic accountant's

Skills required for FA's	Mean	SD	Rank
Auditing skills	14.75	6.7	2
Critical/strategic thinker	10.25	6.2	6
Effective oral communication	14.75	5.2	2
Effective written communication	15.50	5.1	1
Identify key issues	10.25	5.9	6
Investigative ability	13.25	3.6	3
Investigative intuitiveness	12.00	4.2	4
Organize an unstructured situation	12.25	6.6	4
Research skills	13.75	6.8	3
Legal skills	11.75	4.6	5
Simply the information	12.00	4.2	4
Solve structured problems	11.25	4.3	5
Solve unstructured problems	10.00	3.6	6
Synthesize results of discovery and analysis	10.00	5.4	6
Tell the story	13.50	4.4	3
Think like the wrongdoer	11.25	4.3	5
Understand the goals of a case	6.50	2.9	8
Others: psychology skills	10.50	3.1	6
Others: sociology skills	8.75	3.8	7

Based on the survey results compiled by the researcher

In section B, most of the questions asked to the participants of this study have been suggested by Digabriele (2008) to be the important skills of Forensic Accountants (FCAs). The respondents were expected to answer them on a 5-point Likert-type scale, ranging from 4 (strongly agree), 3 (agree), 2 (neutral), 1 (disagree) to 0 (strongly disagree).

Here, nine questions were asked to practitioners, academics and users of FA services that pertain to soliciting their views on "what skills are deemed to be inherently important for Forensic Accountants (FCAs)". The first question asked to the respondents was: "An important skill requirement of a FCA is 'Deductive Analysis' the ability to aim at financial contradictions that do not fit in the normal pattern of an assignment". An expert witness must be able to discern fact from fiction to maintain 'credible' testimony. Courses developed in this area should emphasize the ability to remove any non-corroborated opinions from expert reports and testimony. This skill was rated as one of the more important ones. Not surprisingly, 87.5% academics and practitioners agreed that this is an important skill of FCAs. In consideration of the barrage of recent financial reporting scandals across the globe, this skill appears to be necessary and essential for FCAs to meet the objective of uncovering a potential financial fraud. Thus, FA courses taking aim at financial misrepresentations should incorporate course objectives to meet this ability.

The second question asked to the participants was: "An important skill requirement of a FCA is 'critical thinking' the ability to decipher between opinion and fact". The essence of being an expert witness is to be able to perform the task of discerning fact from fiction in order to maintain a credible testimony. Critical thinking skills are essential to understanding, applying and adapting concepts and principles in a variety of contexts and circumstances. The FCAs professional skepticism of questioning management's responses involves critical thinking that entails an attitude of examining and recognizing emotion-laden and explicit or hidden assumptions behind each question. The FCAs must master critical thinking skills because business organizations continue to evolve in response to new IT and greater worldwide competition. Fundamentally, computer fraud is people fraud and the required computer skills will vary greatly depending on the type of fraud being perpetrated. Frauds such as data diddling require

Table 2: Percentage of respondents choosing each competency skill item for fcas

Items	Strongly disagree (0)	Disagree (1)	Neutral (2)	Total (0, 1, 2)	Agree (3)	Strongly agree (4)	Total (3, 4)
Deductive analysis	0.0	5.0	7.5	12.5	30.0	57.5	87.5
Critical thinking	0.0	0.0	0.0	0.0	25.0	75.0	100.0
Unstructured problem solving	8.3	8.3	13.4	30.0	22.5	47.5	70.0
Investigative flexibility	0.0	0.0	20.0	20.0	16.6	63.4	80.0
Analytical proficiency	0.0	16.7	8.3	25.0	16.7	58.3	75.0
Oral communication	0.0	8.3	8.3	5.0	41.7	41.7	95.0
Written communication	0.0	0.0	0.0	0.0	41.7	58.3	100.0
Specific legal knowledge	0.0	0.0	8.3	2.5	50.0	41.7	97.5
Composure	0.0	0.0	0.0	0.0	25.0	75.0	100.0

Based on the survey results compiled by the researcher

only basic skills; on the other hand, theft of information in a secure database will require more advanced computer skills from the fraudster (Bawaneh, 2011). In addition to rendering of 'traditional' accounting services, FCAs are nowadays involved in fast evolving services such as attestation reviews, forensic accounting and fraud examinations. Today's FCAs must thus, possess the knowledge to remain updated and the skills to critically analyze various problems. Courses developed in this area should emphasize to students the ability to remove any non-corroborated opinions from expert reports and testimony. While critical thinking is necessary for FCAs in today's business world, cultivating students' critical thinking skills in an accounting classroom can be a challenge (Camp and Schnader, 2010). Table 2 illustrates this skill was rated as one of the more important (100%) by all.

The third question asked was: "An important skill requirement of a FCA is 'Unstructured Problem Solving' the ability to approach each situation (inherently unique) and be prepared to solve problems with an unstructured approach". Academics and practitioners agreed (70%) that problem-solving is an important skill of a FCA. Accounting education has been based around concentrating on compliance with rules and procedures. However, FA is different because problem-solving becomes more of an 'improvised' approach rather than a 'structured' plan. This skill type is in direct opposition to the traditional accounting skills. It can be argued that a shortcoming of auditors is "not seeing the proverbial forest beyond the trees". The fourth question asked: "An important skill requirement of a FCA is 'investigative flexibility' the ability to move away from standardized audit procedures and thoroughly examined situations for a typical warning signs". The results of this study indicate that practitioners and academics agree (80%) on the importance of this skill, thus, further illustrating the need in accounting for a more 'open-minded' skill set. The results of the present study indicate that potential practitioners and academics agreed on the importance of FCAs moving away from a 'narrow' approach and applying a more 'holistic' technique. These findings further illustrate the need for a more open-minded skill set in accounting. Considering the post-financial-fraud regulatory environment, researchers can infer that the ability to solve a financial puzzle with an incomplete set of pieces is an extremely important characteristic for FCAs. Practitioner and academics agree on the importance of this skill.

The fifth question asked to participants was: "An important skill requirement of a FCA is 'analytical proficiency' the ability to examine for what should be provided rather than what is provided". Analytics can be of use to FCAs because they often reveal unusual relationships that need to be carefully examined. Consequently, the post-financial fraud regulatory environment, solving a financial puzzle with less than a complete set of pieces appears to be the direction the current business environment is heading. Practitioners and academics agree (75%) on the importance of this skill. Question six asked: "An important skill requirement of a FCA is 'oral communication' the ability to effectively communicate in speech via expert testimony and general explanation; the bases of opinion". Part of the job of the FCA is to go into the field and speak to company personnel, who may or may not be involved with the suspected fraud. In addition, they are often called to be expert 'witnesses' and testify during litigation, presenting often complex evidence to the jury in an understandable manner. Almost 95% of all respondents strongly agree that oral communication is an important skill of a FCA. The seventh question asked was: "An important skill requirement of a FCA is 'written communication' the ability to effectively communicate in writing via reports, charts, graphs and schedules; the bases of opinion". Indeed, a FCA needs to document their work. A well-written report by a FCA can be a vital tool in litigation and may help to impress the judge/jury. All groups 'agreed' (100%) on the importance of this skill, with 60% of all respondents 'strongly agreeing'. Almost 95% of all respondents strongly agreed that oral communication is an important skill for FCAs as shown in

Table 2. This skill is particularly important in expert testimony when a FA explains findings to a judge and panel of judges. Each group agreed on the importance of FCA possesses the ability to effectively communicate in writing and 100% of all respondents agreed strongly. Expert reports are routinely scrutinized and the need to convey findings properly is of paramount importance. The ability to communicate effectively in both oral and written forms is essential for today's practitioners.

In the eighth question participants/respondents were asked: "An important skill requirement of a FCA is 'specific legal knowledge' the ability to understand basic legal processes and legal issues including the rules of evidence". Academics and practitioners agreed and strongly agreed (97.5%) that this is an important skill of FCAs. One of the interesting results of this study is the fact that 'users' of FA services did not view this as an important skill. The reason for this can only be speculated. Since, the users were attorneys, they may have read too far into the question possibly thinking FA's may practice law without proper licensing. However, the main point of the question was to emphasize the need for FCAs to understand certain legal issues. Academics and potential practitioners agreed that FCAs should have a working knowledge of the legal process and the rules of evidence. Carpenter (2007) observes: "Despite a traditional advocacy role, tax professionals face growing pressure to help manage the tax-fraud problem".

Finally, the last (ninth) question asked the participants: "An important skill requirement of a FCA is 'composure' the ability to maintain a calm attitude in pressured situations". The groups did not differ in opinion of this skill. All groups 'agreed' (100%) on the importance of this skill with 75% of all respondents 'strongly agreeing'. The most prevalent area where this is necessary is expert testimony in either deposition or court. The composure of an expert can be an integral component in the ultimate case outcome. From our test of hypothesis, it has been discovered that accountants require special skills to work as FCAs and fraud investigators. Perhaps, this is so in view of the prevalent nature of corruption and scandals in the country. The tenth question asked the participants to identify themselves as a practitioner, academics or a user of forensic accounting services. All the respondents agreed that maintaining composure is an important skill for FCAs.

Descriptive statistics for the nine areas of competencies are shown in Table 2. The items rated as "the 'most' important were critical thinking, written communication and composure (100% each) followed by specific legal knowledge (97.5%) oral communication (95%) and deductive analysis (87.5%)". However, the items rated as 'least' important were "investigative flexibility (80%), analytical proficiency (75%) and unstructured problem solving (70%)". The findings of our study are more or less, similar to a survey which concluded, "The skill ranked 'highest' in terms of importance is analytical skills, followed closely by basic accounting skills, problem-solving skills and data analysis skills. The 'characteristic' ranked 'highest' in terms of importance are persistence and skepticism followed closely by puzzles and people skills" (McMullen and Sanchez, 2010). Thus, the identification of relevant skills of FCAs illustrated in the results of this study would contribute to progress the literature in forensic accounting education by identifying the necessary proficiencies to be merged with the accounting course contents.

Finally, in section C of our questionnaire, we asked the respondents to answer some questions regarding "education for and typical career-paths of FCAs". First, we asked them, "Other than accounting, what undergraduate degree major do you think is most appropriate for a FCA?" The 60% of the respondents answered "computer information systems" and 27% answered "legal studies". Table 3 presents the results for this question. We also asked, "What is the highest-level of education that you think is needed to be a successful FCA?" The 59% of the participants indicated that an undergraduate degree is the highest-degree necessary while 39% felt that a master's degree is necessary. Finally, participants were asked, "What is the typical career-path for a FCA in your firm?" The 43% indicated that the typical career path is to graduate with a degree in accounting and start in the audit department of the firm.

Secondly, we asked the respondents some questions about "the demand for FCAs in the future next 5, 10 and

Table 3: Type of education required for Forensic Chartered Accountants (FCAs)

Undergraduate degree major most appropriate	Percent
Computer information systems	60
Economics	3
Legal studies	27
Other	10
Total	100
Highest level of education needed to be successful	
Undergraduate degree	59
Master's degree	39
Other degree	2
Total	100
Typical career path	
Start as intern	13
Graduate with degree in forensic accounting and join firm	8
Graduate with degree in accounting and start in audit department of firm	43
Work in legal profession before joining firm	1
Work in law enforcement before joining firm	3
Other	32
Total	100

Based on the survey results compiled by the researcher

20 years". As can be seen from Table 4, the majority of respondents felt that the demand for FCAs will increase well into the foreseeable future. In fact, 94% felt that the demand for FCAs would increase in the next 10 years. Respondents were also asked "if they felt that there will be enough FCAs available to meet the demand in the next 5 or 10 years and beyond the next 10 years". As can be seen in Table 5, many participants were unsure if the supply of FCAs would be enough to meet the demand in the future.

Finally, the sampled respondents were asked, "In general, do FCAs needs to know computer-based forensic techniques?" The 84% of the respondents answered in "yes" to this question. Moreover, we asked the respondents "how important four different software tools are for FCAs: ACL, IDEA, Data Mining and Digital Evidence Recovery". The scales were anchored at each end with the descriptors "extremely unimportant" and "extremely important", respectively. For the purpose of analysis, the descriptor "extremely unimportant" was given a weight of 1 while the descriptor "extremely important" was given a weight of 7. The mid-point of the scale "neither" was given a weight of 4. Table 6 shows the results. The respondents rated each of these four tools as important, with data mining being rated as the most important with a mean score of 5.83.

Table 4: Demand for Forensic Chartered Accountants (FCAs) in the future

Questions	Mean	SD
The demand for forensic accountants in the next 5 years will	4.46	0.646
The demand for forensic accountants in the next 10 years will	4.34	0.651
The demand for forensic accountants in the next 20 years will	4.20	0.728

Table 5: Availability of Forensic Chartered Accountants (FCAs) in the future

Questions	Percent
Will there be enough forensic accountants available to meet the demand in the next 5 years?	
Yes	13
No	62
Not sure	25
Total	100
Will there be enough forensic accountants available to meet the demand in the next 10 years?	
Yes	25
No	29
Not sure	46
Total	100
Will there be enough forensic accountants available to meet the demand beyond the next 10 years?	
Yes	32
No	16
Not sure	52
Total	100

Table 6: Ratings of the importance of the software tools for forensic chartered accountants

Tools	Mean	SD
ACL	5.45	1.297
IDEA	5.24	1.232
Data mining	5.83	1.240
Digital evidence recovery	5.82	1.224

Based on the survey results compiled by the researcher

CONCLUSION

FA in India of late has come "to limelight due to the rapid increase in 'white-collar' crimes and the belief that our law-enforcement agencies do not have the 'expertise' needed or time to uncover frauds" (Bhasin, 2013a, b). The recent accounting scandals have induced a crisis of confidence in financial reporting practice and effectiveness of CG mechanisms. "What the use of fingerprints was to the 19th century and DNA analysis was to the 20th century, so financial information and forensic accounting has come to be one of today's most powerful investigative and intelligence tools available" (Muehlmann *et al*., 2012). Interestingly, DeLoach characterized FA as "somewhat of a 'niche' because it requires multi-disciplinary expertise that crosses the realms of accounting, criminal investigation, regulatory legislation and judicial litigation". We have seen growth in all areas of forensics, especially in computer forensics which is being driven by the increasing use of technology and concerns about cyber-security. The FBI and Justice Departments are looking for FCAs because the reach of the profession has spread to areas such as money laundering and even terrorism cases (Brooks *et al*., 2005). KPMG, a large accounting firm, believe the market is sufficiently large to support an independent unit devoted strictly to 'FA'. All of the larger accounting firms as well as many medium-sized and boutique firms have recently created FA departments.

No doubt, the accounting profession is witnessing major changes due to changes in technology. As it pertains to investigative accounting, "the modern digital environment offers new opportunities for both perpetrators and investigators of fraud. The increasing rate of computer-based financial crime has created a huge demand for the skills and services provided by FCAs". In order to find "the smoking gun", the FCAs will need to be able to dig-deep into the company's computer system. To facilitate the preservation, collection, analysis and documentation of evidence, FCAs can use specialized software and computer hardware. For instance, Deloitte and Touche has set up a world-wide network of computer forensic labs for their FCAs and technicians. There are many new technologies that allow the investigators to recover deleted files, crack encryptions or codes and extract and sort data. Furthermore, we recommend that "Extensible Business Reporting Language (XBRL) should

be integrated across the accounting curriculum". Several countries have already adopted XBRL in a variety of information value-chains, notably in the USA context the Securities and Exchange Commission's interactive data program and in Indian context, "Corporate Filing and Dissemination System (CFDS)" used by SEBI from 2010. Thus, XBRL/CFDS has implications for the totality of the accounting curriculum and pedagogy. A program for the integration of them across a typical accounting curriculum should be developed soon.

The degree of professional skepticism auditors currently employ differs from the level used by FA's. This is primarily why the AICPA and education leaders have called for "more FA education for auditors" (Carpenter *et al*., 2011). In addition, the PCAOB has emphasized that the detection of fraud should be an important objective of an audit. Despite the depth and breadth of authoritative standards available to guide accountant and auditor conduct, numerous stories in the press as well as academic research indicate that these standards have not been completely successful in eliminating ethical violations by accountants. Because of these continued breaches, confidential reporting mechanisms have received significant attention in recent years (Orumwense, 2013).

As mentioned earlier, this research study was conducted in 2011-12 and initially we surveyed 120 potential practitioners, academics and prospective users of FA services from the NCR region to determine "whether there are differences in views of the relevant skills suggested in the literature and practitioners". In fact, this is a 'preliminary' investigation of the necessary skills, education requirements and training requirements for the FCAs in the Indian context. Accordingly, we surveyed academics, practicing fraud and FCAs in order to determine the perceptions of the professional community. Since, very little research exists in this area in the Indian context, present research is both an 'exploratory' and 'qualitative' in nature. Indeed, this questionnaire-based survey was divided into three sections. In section A, the list of choices provided to the participants was developed through an extensive review of the relevant academic and professional literature, consultation with FCAs and users of forensic services. Based on the outcome of the current study, descriptive statistics for the 19 areas of skill competency including the overall means, standard deviations and ranks are shown in Table 1. We can conclude: "the skill competency items rated as the most important (with rank of 1 and 2) were effective written communication (M = 15.5, SD = 5.1), auditing skills and oral communication (M = 14.75, SD = 6.7, 5.2). Moreover, the research skills (M = 13.75, SD = 6.8), tell the story and investigative ability (M = 13.5, 13.25; SD = 4.4, 3.6) took the second position (with rank of 3) in terms of importance".

Next, in section B, 9 questions were asked to the practitioners, academics and users of FA services that pertain to soliciting their views on "what skills are deemed to be inherently important for FCAs". Descriptive statistics for the 9 areas of competencies are shown in Table 2. The items rated as the 'most' important were critical thinking, written communication and composure (100% each) followed by specific legal knowledge (97.5%) oral communication (95%) and deductive analysis (87.5%). However, items rated as 'least' important were investigative flexibility (80%), analytical proficiency (75%) and unstructured problem solving (70%)". Not surprisingly, these findings are very similar to another previous study. Finally, in section C, we asked the respondents to answer some questions regarding "education for and typical career-paths of FCAs". First, we asked them, "Other than accounting, what undergraduate degree major do you think is most appropriate for a FCA?" Over 60% of the respondents answered computer information systems and 27% for legal studies. We also asked, "What is the highest-level of education that you think is needed to be a successful FCA"? Around 59% of participants indicated that bachelor degree is the highest-level of education necessary to be successful FCAs. Finally, participants were asked, "What is the typical career-path for a FCA in your firm"? Close to 43% of the respondents indicated that the typical career path is to graduate with a degree in accounting and start in the audit department of the firm (Table 3). In response to the question "what would be the demand for FCAs in the future next 5, 10 and 20 years" the overwhelming majority (94%) felt that "the demand for FCAs will continue to be high" (Table 4). However, many participants (ranging from 25-52%) were unsure if the supply of FCAs would be enough to meet the demand in the future (Table 5). In response to the question, "in general, do FCAs needs to know computer-based forensic techniques"? majority of them answered in "yes". Moreover, we also asked the respondents "how important four different software tools are for FCAs: ACL, IDEA, Data Mining and Digital Evidence Recovery?" The respondents rated each of these four tools as important with data mining being rated as the most important with a mean score of 5.83 (Table 6).

RECOMMENDATIONS

We recommend that "all the leading Indian and/or other universities should consider these findings while designing their curriculum and students will also find this

information valuable when deciding about choosing a major and considering their career paths". Universities should evaluate their course offerings and implement programs for assessment of their courses. Firm training programs should similarly evaluate course contents. These results show that "some skills are relevant and important to the outcome of FA education. Educators can use these skills as a guide to direct academic curriculum with the proper learning outcome objectives". Undoubtedly, much more research in this area is still needed. Furthermore, we recommend that "Extensible Business Reporting Language (XBRL) should be integrated across the accounting curriculum".

Knowledge and application of technology is increasingly essential in effective FA, anti-fraud programs and fraud investigations. Accounting students need to be aware of IT-based schemes and have an appreciation for the need to use specialists to support the work of the accountant in auditing or investigating computer-based fraud and FA issues. Many higher education accounting programs are considering incorporating fraud examination and FA content in their curricula. The auditing environment after the passage of SOA demands students with greater understanding of risk assessment (including business and fraud risks), FA skills, the ability to understand and document controls and link controls to assertions and audit evidence and the competence to deal with CG and other PCAOB requirements. Acquiring these skills will require changes in the basic auditing course and one/more advanced auditing courses as well as changes in the core business and accounting curriculum.

Prior to Satyam (often called as India's Enron) corporate accounting fraud, most companies perceived fraud as largely an internal event, primarily pinching the bottom line. They now understand that fraud can have an impact not only on the reputation and business prospects but also on the survival of the firm. This concern has led to higher demand for FCAs in countries like India and China. The Ministry of Corporate Affairs in India has also established the Serious Fraud Investigation Office which seeks the help of FCAs. The government recently proposed to give more teeth to the SFIO under the new Companies Bill by providing it statutory recognition and empowering it with more powers. The FCA's being professional members of the CG and Audit Committees, can play a far greater role in coordinating company efforts to achieve a cohesive policy of ethical behavior within an organization (Bhasin, 2013a). By helping companies to detect and prevent fraud, FCAs can create a 'positive' work environment, establish 'effective' lines of communication and be vigilant as a corporate 'watchdog', the FCAs role can gradually evolve into a key component in the CG system. Let us hope that FCAs, through their specialized knowledge, training and skills will be able to improve CG scenario, still a work-in-progress, across the globe.

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