ANALYZING FAIR VALUE AUDITING IN CONTEMPORARY FINANCIAL REPORTING SCENARIO

Ph.D. THESIS

by

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CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the thesis entitled **"ANALYZING FAIR VALUE AUDITING IN CONTEMPORARY FINANCIAL REPORTING SCENARIO"** in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy and submitted in the Department of Management Studies of the Indian Institute of Technology Roorkee, Roorkee is an authentic record of my own work carried out during a period from July, 2013 to July, 2017 under the supervision of Dr. J P Singh, Professor, Department of Management Studies, Indian Institute of Technology Roorkee, Roorkee.

The matter presented in the thesis has not been submitted by me for the award of any other degree of this or any other Institute.

(PRINCE DOLIYA)

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

(**J P Singh**)
Supervisor

The Ph.D. Viva-Voce of Examination of Mr. Prince Doliya, Research Scholar, has been held on ……..

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Date:

ABSTRACT

The importance of "audit" function in the corporate regulatory framework has been increasing monotonically in the last decade with the gradual adoption of Fair Value Measurement (FVM hereinafter) by accounting regulators across the world. FVM, as defined by IFRS 13, is "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date", has become an essential part of contemporary financial reporting scenario. In this revolutionized environment, the auditor's functional domain, his approach, methodology, and the nature of his responsibilities are all undergoing a metamorphosis. The auditor's role moves away from a conventional, mechanized attester of tangible evidence to one that exercises an exceedingly judgmental function in a holistic assessment of (sometimes highly subjective) substantiation of values ascribed to be fair by the entity's management. The Public Company Accounting Oversight Board (PCAOB hereinafter) of the United States has gone on record stating that auditors are inadequately prepared to confront complicated issues in relation to evaluating FVMs (Bratten *et al.,* 2013). Several other studies also highlight the fact that neither corporate accountants nor auditors have been able to keep pace with the progression and developments in this area resulting in a massive competency gap that poses serious challenges to the professional accounting bodies and regulators. Therefore, a comprehensive examination of auditors' decision-making process in FVM auditing is required for effective and informed audit decision-making that may lead to improved audit quality.

To achieve this objective, this study follows a confined approach to analyze the factors influencing auditors' decision making process in FVM Auditing. Afterwards, this study aims to rank and prioritize the pre-identified factors of auditor decision-making process. In the end, we establish an interrelationship among top ranked factors (identified at earlier stage) and assess the driver and driving forces of FVM audit process.

At first stage of analysis, this study performs a comprehensive analysis of factors affecting auditors' decision-making process in FVM auditing from different stakeholders perspectives. The major findings of this study are as follows: In the first stage, we have carried out a principal component analysis on the collected data to extract the meaningful factors that may influence the auditors' decision-making in FVM auditing. Factor analysis extracted the twelve factors namely: Estimation uncertainty, Regulators, Audit firm relationship with other firms, Presentation & format, FVM

complexity , Standards ambiguity, Managerial bias, Audit fee, Cognitive limitations, Professional skepticism, Knowledge & understanding, and Valuation specialist.

The results of the earlier section gives an insight that auditors follow a multi-criteria decision-making (MCDM) technique for FVM audit decision making. To organize our discussion and rank above identified factors, we adapted Bonner (2008) theoretical research framework, which discuss the auditor's decision making progress through three critical factors the environment (Estimation uncertainty, Regulators, Audit firm relationship with other firms, and Presentation & formats), auditors specific (FVM complexity, Standards ambiguity, Managerial Bias and Audit fee) and the task related factors (Cognitive limitations, Professional skepticism, Knowledge & understanding and Valuation specialist). Results revealed that task related factors with global weightage of 0.557 are most significant factors in FVM audit process. Further, environmental factors with 0.3202 weightage and auditors specific factors with 0.1226 weightage are second and third in global ranking. This reveals that despite increasing environmental and auditor's specific challenges, factors that specifically associated with "fair value measurement" task is still the most important factor in fair value environment.

Further, Interpretive Structural Modeling (ISM) has been used to construct the inter-relationship grid between top ten factors of FVM audit process. The ISM output shows that Regulators and Standards ambiguity are the most significant of the ten identified key factors that have been input to the model as they are placed at the bottom. Audit fee on which cost efficiency of FVM audit depends appeared at the top of the hierarchy. Knowledge & understanding affects FVM complexity that plays a vital role in determining the requirement of Valuation specialist. High level of complexity and low level of knowledge enhances the need of Valuation specialist in the FVM audit process. Valuation specialist and estimation understanding mutually affect each other, as regular and judicious use of Valuation specialist helps in reducing the Estimation uncertainty in FVM audits. Further, high Estimation uncertainty elevates the level of Professional skepticism used by auditors. Similarly, Presentation & format also affects the level of Professional skepticism in financial statements. Our finding shows that Professional skepticism and Presentation & format are mutually interrelated to each other. Both of these factors collectively influence the level of Managerial bias in financial statements as skepticism and framing can enhance the opportunity for Managerial bias in financial statements. Contrary to literature (Cannon and Bedard, 2014). ISM indicated no direct relationship between Estimation uncertainty and FVM complexity reflecting the views of the panel that it was

the intrinsic nature of the FVM and the management inputs with regard thereto that leads to complexity rather than explicit uncertainties in estimations.

The present study sets forward several implications for auditors', academia, managers and regulators. This study extends the existing literature of FVM audit process and elaborates the hierarchical relevance of certain empirically identified factors in FVM audit process thereby assisting auditors' to find anomalies in their FVM audit process and take corrective actions against it. This is the first study, which evaluated the FVM auditing process through any technique of multi-criteria decision-making. Second, the prioritization of factors through numeric weightage may help auditors in determining the impact ratio of factors in FVM auditing process. Although factors with high weightage required additional efforts from auditors, but complete overlook of low weightage factors is also not advised as ranking may change in different economic context. Furthermore, regulatory bodies like the PCAOB and Financial Accounting Standards Board can use these findings to formulate new auditing standards and to restructure the existing FVM auditing framework. Finally, this study would help the managers for in-depth understanding of FVM audit process and thereby give them a perspective for providing precise inputs to the auditors wherever required.

“DEDICATED TO MY MOTHER SAROJ DEVI”

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"**I am thankful to Lord Balaji, for giving me courage and perseverance to fulfill my dream"**

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PRINCE DOLIYA

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

FVA	Fair Value Accounting
HCA	Historical Cost Accounting
FVM	Fair Value Measurement
IASB	International Accounting Standards Board
FASB	Financial Accounting Standards Board
IFRS	International Financial Reporting Standard
PCAOB	Public Company Accounting Oversight Board
CAQ	Center for Audit Quality
EFA	Exploratory Factor Analysis
PCA	Principal Component Analysis
ICAI	Institute of Chartered Accountants of India
AHP	Analytic Hierarchy Process
EITF	EITF Emerging Issues Task Force (USA)
IFRIC	The IFRS Interpretations Committee of the IASB
SEC	Securities and Exchange Commission (USA)
GAAP	Generally accepted accounting practice (IFRS and USA)

CHAPTER 1

INTRODUCTION

Preview

This chapter introduces the work done during the course of the present research. The chapter starts with the introduction of audit function in fair value environment. Next, the need and significance of fair value along with its different explanation in different accounting standards is discussed. Afterwards, impediments to auditing of fair value measurements and related auditing standards are discussed in detail. Problem statement is given to define the scope of the current research. The rationale of the study is provided, followed by the various research objectives and questions. A proposed conceptual model is also given. Thereafter, the methodology adopted in this research is summarized. At the end of the chapter organization of thesis have been laid down.

CHAPTER 1
INTRODUCTION

1.1 The Audit Function in Fair Value Environment

The importance of the "audit" function in the corporate regulatory framework has been increasing significantly over the last decade with the gradual adoption of Fair Value Measurements (FVM hereinafter) by accounting regulators across the world. In this revolutionized environment, the auditor's functional domain, his approach and methodology and the nature of his responsibilities are all undergoing a metamorphosis. The auditor's role moves away from conventional, mechanized attester of tangible evidence to one that exercises an exceedingly judgmental function in a holistic assessment of (sometimes highly subjective) substantiation of values ascribed to be fair by the entity's management. Resourceful audit firms do have organized training and development mechanisms set in place for their staff to ensure that such staff remains adequately educated and technically equipped on contemporary aspects of the profession.

Nevertheless, the incessant development of complex and innovative financial instruments and novel business practices that demand the application of innovative valuation models and assumptions present an unrelenting challenge (Martin et al., 2006). The Public Company Accounting Oversight Board (PCAOB hereinafter) of the United States has gone on record stating that auditors are inadequately prepared to confront complicated issues in relation to evaluating FVMs (Bratten et al., 2013). Several other studies also highlight the fact that neither corporate accountants nor auditors have been able to keep pace with the progression and developments in this area resulting in a massive competency gap that poses serious challenges to professional accounting bodies and regulators. In their analysis of the Enron scandal, Benston and Hartgraves (2002) inferred that the auditing staff of Enron's statutory auditors (Arthur Andersen LLP) was unable to understand the implications of the complex financial status and mechanisms established by Enron's CFO, Andrew Fastow. It seemed to the said authors that Andersen's technical staff was relatively more conversant with the profile of Enron's oil and gas business, but failed to completely apprehend the implications of the company's newly instituted activities in innovative financial instruments. This probably, led to the inadequate and non-contextual reporting by the company's auditors in their annual reports.

Enron's case provides an immediate illustration of one of the cardinal impediments to the universal adoption of FVM, viz. the difficulties associated with the attestation thereof. In the defense of Andersen, one could claim that an audit firm cannot possibly be expected to possess "expert" resources in every business activity of the modern complex commercial world (Coffee Jr., 2002; Partnoy, 2002)

However, accounting regulators invariably provide for the engagement of "specialists" by audit firms and permit such audit firms to use and integrate specialists' reports in their own audit reports. In the United States, AU Sec. 336 (AU Sec 336, Work of a Specialist, AICPA, 1998), while accepting that the auditors cannot be proficient in all intricate or subjective matters of an audit, does mandate that they must have sufficient understanding to evaluate the adequacy of specialists' work, in case such specialists are engaged by the audit firm. Generally, auditors need to take a call on when to engage a specialist and how to incorporate and interpret the specialist's work into the main audit process. It is true that using specialists in the audit team adds an additional layer of complexity to the audit influencing the audit team structure, incentives, and culture sharing within firms. However, audit firms need to have a broader perspective of the issues involved. Indeed, in the last decade, there has been an increasing trend in fair value auditing to engage the expertise of specialists. Hopefully, this trend will increase with the ongoing harmonization of accounts and the implementation of International Financial Reporting Standards (IFRS hereinafter) throughout the world.

1.2 Need for Fair Value Accounting?

In an idealized setting, the financial statements of an entity should represent "economic reality" (Doliya and Singh, 2015). In this vein, "profit" should manifest itself as an accretion in the overall market value of the entity. Equivalently stated, "profit" should be computed as the incremental worth of the enterprise assessed at the marketplace for the accounting period (Lukose and Rao, 2010). We present an example to illustrate this point. We take a manufacturing company that purchases raw materials and other resources from the market, converts them to finished products and sells these products to generate its revenue stream. It is seen that a depletion of assets occurs on one side e.g. the decrease in economic life (and therefore, economic worth) of the various fixed assets involved in the production process and the consumption of stores and raw material. On the other side, there occurs a creation of assets because of the realization of sale proceeds. If the latter exceeds the former, the excess is

termed as "profit". To reiterate, then, "profit" earned by an entity in an accounting period is the accretion in market value of the entity during that period or in other words difference between the fair market value and the historical bookvalue is just the present value of future residual incomes (Dutta and Reichelstein, 2005). This is also justified on the count that profit earned during the period must be reflected in an increase in the aggregate assets of the enterprise.

This nexus between profit and value leads us to the philosophy of FVM. Conventionally, historical cost has substantively been the underlying valuation methodology of all accounting statements. However, the fallibilities of Historical Cost Accounting (HCA hereinafter) are well documented. To take the case of "fixed assets", the amortization of such assets over their economic life is, for the most part, arbitrary because the consumption pattern of such assets is not amenable to a precise mathematical model. The other option of ascertaining their economic value empirically at the end of each accounting period is equally impracticable on the counts of substantial expenditure for the exercise as well as the limited accuracy and reliability of the results (Pattanayak, 2000). It is, therefore, usual to impute a consumption pattern to such assets and amortize them on that basis. The saving grace here is that improper amortizations result merely in timing differences in the recognition of profits across different accounting periods. However, the aggregate profit earned over the life of the entity remains unchanged. Even in the case of current assets, in times of consistently falling prices, non-existent reserves would accumulate in the accounts of an entity if historical cost valuations are adopted for such assets due to overvaluation of stocks.

It is thus obvious that even in the simplest business scenario, HCA is plagued with many inconsistencies. It is no surprise, therefore, that there is a marked unrest in the accounting fraternity against HCA. A vigorous campaign ran for a long time all around the world, especially in the United States, to marshal in FVM reforms. In essence, incongruity between HCA and FVM is essentially a manifestation of the long standing "reliability" vs. "relevance" debate. Till recently, the accounting fraternity across the world was obsessed with a clear conviction of the preeminence of "reliability" over "relevance". The accounting regulators and the auditing professionals were emphatic votaries of the former, for the obvious reason that conventional "vouching" formed the mainstay of the auditing process and transactions were, largely, objectively verifiable as a consequence (Singh and Uzma, 2011).

Accounting regulators invariably prescribe "true and fair" as the overriding qualification for all financial statements. The UK Companies Act, 2006 contains this provision in Sec 393. Therefore, financial statements need necessarily present a "true and fair" picture of financial affairs of the reporting entity. Partly as a consequence of the gradual social and scientific evolution processes and partly due to the increasing complexities of the implications of contemporary financial products and transactions, it is, now, widely perceived that HCA based statements fail to fairly report information of the reporting entity in the manner and to the extent that they are required to do. It is, therefore, being increasingly felt necessary that recourse be had to FVM as the primary reporting methodology (on the premise that FVMs are substantially more "relevant") and use of HCA be confined to the accounting of fixed assets wherein any differences in valuations would result merely in "timing differences" in recognition of income. In particular, four areas where FVM is very conspicuous by its presence are:

(i) Accounting for financial instruments;

(ii) Accounting for business combinations; and

(iii) Accounting for post-retirement benefits and pension.

(iv) Accounting for intangibles

In the context of fair value based reporting of derivatives, it is pertinent to mention here that, in the normal course, i.e. when such derivatives are held on their own as open positions, their reporting must necessarily be marked to market. Business combinations occur when an entity obtains control over another entity (Aghimien *et al.*, 2014). The accounting for business combinations under IFRS is administered by IFRS 3-Business Combinations, which mandate that companies should use the "acquisition" method for business combinations reporting in lieu of the "purchase" method (Garrow, 2010 and Garrow *et al.*, 2012). The "acquisition" method recommends that fair value measurement principles should be used for net consideration calculation, net asset value, and any goodwill reorganization from bargain purchase (Rani *et al.*, 2014; 2015).Pension accounting involves application of projected unit method, determination of current service cost and most importantly, calculation of fair value for plan assets which makes it highly complex to understand. Fixed assets are the real earning assets of a business enterprise but growing contribution of intangible assets in financial

statement can-not be ignored (Singh *et al.,* 2014). FASB 142 issued by FASB outlined the present value approach as the best alternative to determine the fair value of intangible assets after its acquisition (Singh and Uzma, 2013)

1.3 What is Fair Value Measurement?

FVM is defined as the accounting system in which assets and liabilities are reported at their respective estimated current values. "Fair value" is defined in IFRS 13 (ASC 820, FASB, USA) as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date". Here, fair value is based on the exit price (the price that would be received to sell an asset or paid to transfer a liability), not the transaction price or entry price (the price that was paid for the asset or that was received to assume the liability). Conceptually, entry and exit prices are different. The exit price concept is based on current expectations about the sale or transfer price from the perspective of market participants whereas entry price represents the perspective of the buy-side and refers to the purchase price which is determined on the amount required to exchange the asset or liability in an orderly transaction between market participants.

"Measurement" constitutes the cardinal activity in the process of financial reporting (Barth, 2007; Rao and Dandale, 2008). The activity of "measurement" consists of two parts, namely (i) identifying a valuation base with respect to which measurement is to be made, and (ii) computing the value of the asset/liability in the selected valuation base.

Fair value measurement requires using one of the three valuation bases:

(i) **Income approach**- Income approach capitalizes the projected income stream from the asset using the discounted cash flow (DCF) method for measurement purposes. Income approach converts future amounts (i.e., cash flows or income and expenses) to a single current (discounted) amount. When the income approach is used, the fair value measurement reflects current market expectations about those future amounts. Income approaches can be used to measure the value of liabilities, intangible assets and financial instruments when those assets are not traded in an active market.

(ii) **Cost approach -** Cost approach defines cost as the current replacement value and assumes that the fair value would not exceed what it would cost a user to acquire or construct a substitute asset of comparable utility, adjusted for obsolescence (economic,

physical or technical). The cost approach is typically used to value assets that can be easily replaced, such as property, plant, and equipment.

(iii) **Market approach -** Market value approach adopts prices and other related factors used in market deals in the same or commensurable assets or liabilities. This valuation base adopts market multiples that are derived from a set of comparisons. The market approach is also used commonly for real estate when comparable transactions and prices are available, and can be used to value a business or elements of equity (e.g., NCI). The market approach may also be used as a secondary approach to evaluate and support the conclusions derived using an income approach.

The methodology for the ascertainment of fair value is elaborately prescribed in IFRS 13 and ASC 820. However, the various situations wherein FVM based measurements are to be used for reporting are not explicitly stated in IFRS 13 (ASC 820, FASB, USA). Nevertheless, there are several other standards that do unambiguously mandate the use of FVMs for reporting purposes, e.g. for financial derivatives (IFRS 9, IFRS; FAS 133, FASB, USA), intangible assets (IAS 38, IFRS; FAS 141,141(R), FASB, USA), etc.

To ensure consistency in FVMs, IFRS 13 (ASC 820, FASB, USA) provides for a three level hierarchy of valuation inputs for the purpose of estimating the fair value of an asset or liability. These levels explicitly enumerate the relevant valuation inputs under different marketability scenarios of the asset or the liability. In essence, they represent the best available sources of data for valuation in said marketability scenario.

1.4 Impediments in Auditing of Fair Value Measurements

At the very outset, it needs to be emphasized that FVMs are essentially market based, either directly or indirectly, and such market based valuations may not necessarily reflect the quantum of "future economic benefits" that may be derived from the asset, i.e. its intrinsic value (Pannese and DelFavero, 2010). In particular, the "intrinsic value" of an asset is always valuer-dependent. To this extent, the very genesis of FVM is flawed. However, we shall confine ourselves herein to issues of auditing of measurements of fair values as prescribed in the 3-level input hierarchy referred to in the preceding section. The three levels of the input hierarchy are discussed below.

Level 1 - Level 1 inputs include unadjusted quote prices of the active market for identical assets or liabilities that the entity can access at the measurement date. Level 1 input represents the most reliable evidence of fair value. If a quoted price in an active market is available, then an entity must use this price to measure fair value without adjustment; although adjustments are permitted in limited circumstances. In practical terms, the list of instruments that likely qualify as Level 1 fair value measurements is fairly narrow. It includes the following:

i. Listed equity securities traded in active, deep markets (for example, NYSE, BSE, NASDAQ, etc.).
ii. London Metal Exchange futures contract prices.
iii. On-the-run treasury bonds
iv. Treasury bills (both on- and off-the-run, 3 because of the high volume of trades and pricing based on those trades)
v. Exchange-traded futures and options.
vi. Open-ended mutual funds with published daily NAV at which investors can freely subscribe to or redeem from the fund.
vii. Closed-ended registered mutual funds (for example, exchange-traded funds) traded on active markets.

Level 2 - These are: (i) market inputs that reflect quoted prices for identical assets or liabilities in markets that are not active, or quoted prices for similar assets or liabilities in all markets, adjusted for differences; (ii) market inputs other than quoted prices, such as interest rates, yield curves, volatilities, and default rates; (iii) market inputs not directly observable for the asset or liability, but that are corroborated by other market data through correlation or other means. Examples of instruments that are typically Level 2 measurements include:

i. Most U.S. public debt.
ii. Short-term cash instruments.
iii. Certain derivative products.

Level 3- These inputs are entity inputs. These levels are determined on the basis of the lowest level input that is significant to the measurement process as a whole. These inputs are developed on best available market information in absence or very less presence of active

market. Common examples of assets or liabilities typically valued using Level 3 measurements include:

i- Complex instruments, such as longer-dated interest rate and currency swaps and structured derivatives.

ii- Fixed income asset-backed securities, depending on the specific asset owned (i.e., the specific tranche), the nature of the valuation model used, and whether the inputs are observable Impairment testing of goodwill or indefinite-lived intangible assets.

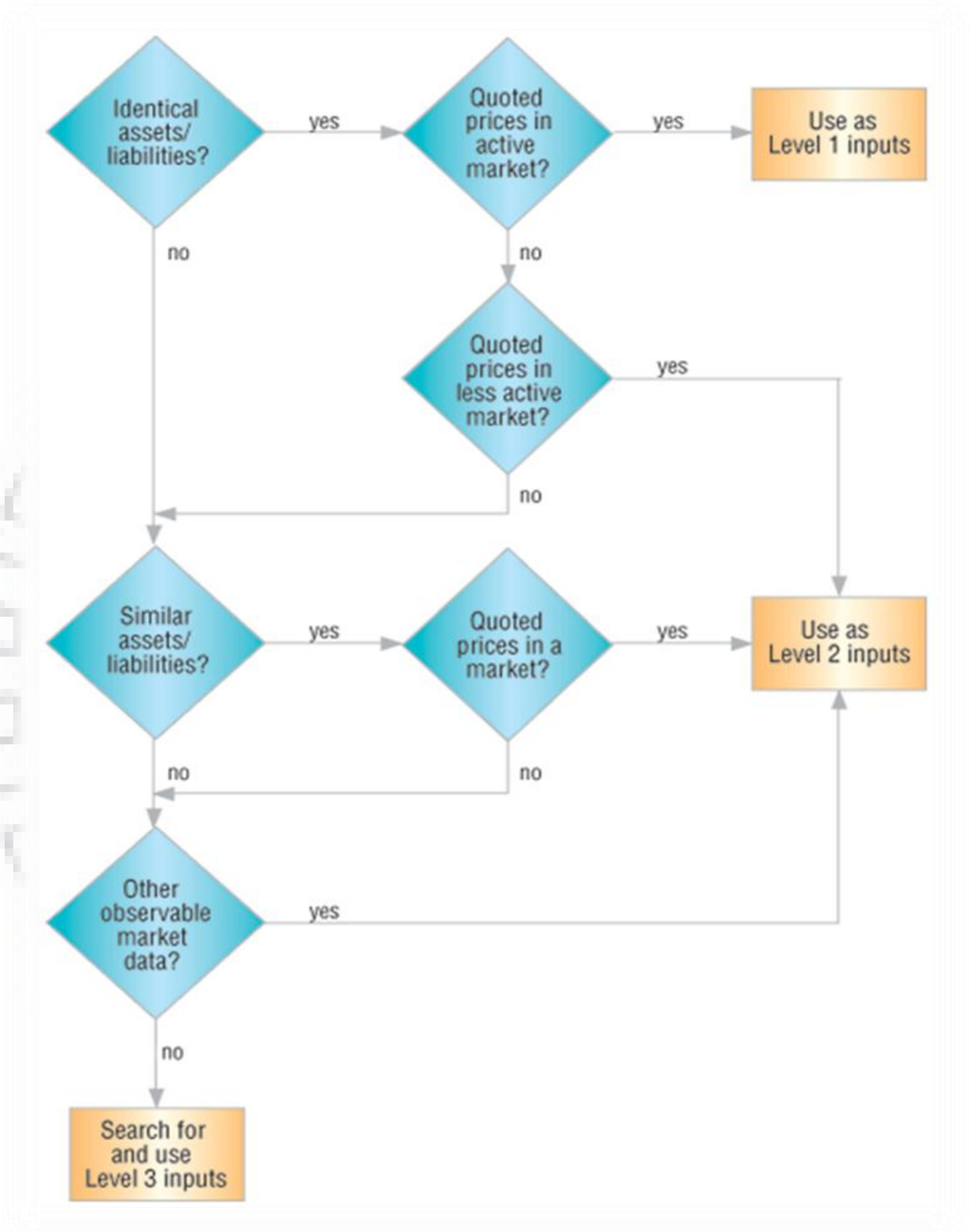


Figure 1.1: FVM Hierarchy (Miller and Bahnson, 2007)

It is obvious that FVMs based on Level 1 inputs should present little difficulty to the auditor on account of the existence of substantively objective evidence and consequently, limited discretion for the entity's management in ascribing fair value. The problem level for the auditor, however, escalates as we move down the input level hierarchy with the dilution of the objectivity of the substantiating evidence supporting management's estimates of fair value. Verifiability and consequently, reliability becomes a cardinal issue for Level 2 or Level 3 based valuations because such valuations are essentially obtained as theoretical market prices. In fact, Level 3 inputs are, for all intents, unobservable and internal to the entity. Consequently, the resulting valuations are prices that represent the management's opinion of the market dynamics in relation to the asset being valued. It immediately follows that Level 3 based valuations are susceptible to measurement error at least on two counts: (i) error(s) in the modelling of relevant price processes; and (ii) error(s) in the assumptions and other inputs that go into the model for estimation of the market price in the stipulated (hypothetical) market set up. Both these types of errors could emanate from the existence of intentional or unintentional biases and prejudices of the management. To that extent, FVMs become immensely more vulnerable to manipulations by deceitful stakeholders with the audits, even by professionals of uncompromising integrity, being rendered ineffective substantively (Benston, 2008). In fact, several empirical studies point to the presence of conscious bias on the part of the entity's management in FVMs (e.g., Dietrich et al., 2001; Hodder et al., 2006; Danbolt and Rees, 2008; Ramanna, 2008; Ramanna and Watts, 2009).

1.5 Scope of Fair Value under IFRS and US GAAP

The fair value standards apply in all circumstances where accounting pronouncements require or permit fair value measurements, measurements based on fair value (such as fair value less costs to sell), and disclosures about fair value measurements, with limited exceptions, as specified. The fair value standards are not applicable to such measurements that are similar to fair value measurements, but do not produce a fair value measure. For better understanding, the scope of fair value is summarized in the table below based on current IFRS rules and US GAAP.The table features the most important asset and liability groups for which the regulation allows subsequent (after the acquisition, at the balance sheet date/end of the reporting period) valuation at fair value.

Table 1.1. Application of fair value (ASC 820) Under US GAAP

Asset retirement and Environmental obligations (ASC 410)	Financial assets/liabilities eligible for fair value option (ASC 825-10)	Distinguishing liabilities from equity (ASC 480)	Business combinations (ASC 805)
Financial instruments (ASC 825)	Property, plant, and equipment (ASC 360)	Debt and equity investments (ASC 320)	Goodwill and intangibles (ASC 350)
Stock compensation (ASC 718)	Derivatives (ASC 815)	Guarantees (ASC 460)	Nonmonetary transactions (ASC 845)
Employee benefits (ASC 715 and ASC 960)	Hybrid financial instruments (ASC 815-15)	Transfers and servicing (ASC 860)	Exit and disposal costs (ASC 420)
Troubled debt restructurings (ASC 470-60)			

Table 1.2. Application of fair value (IFRS 13) Under IFRS

Business combination assets acquired and liabilities assumed (IFRS 3)	Financial instruments: recognition and measurement assets/liabilities eligible for fair value option (IAS 39)	Noncurrent assets held for sale & discontinued operations (IFRS 5)	Business combinations non-controlling interests in an acquire (IFRS 3)
Investment property (IAS 40)	Employee benefits postemployment benefit obligations (IAS 19)	Property, plant and equipment—revaluation model and exchange of assets (IAS 16)	Consolidated financial statements—investments subsidiaries by investment entities (IFRS 10)
Revenue (IAS 18)	Investments in associates and joint ventures held by mutual funds & similar entities (IAS 28)	Financial instruments: presentation—hybrid financial instruments (IAS 32)	Financial instruments: recognition and measurement—financial guarantee contracts (IAS 39)
Intangible assets—revaluation model (IAS 38)	Agriculture—biological Assets (IAS 41)	Impairment of assets—nonfinancial assets (IAS 36)	Financial instruments: recognition and measurement—debt and equity investments (IFRS 9 and IAS 39)

1.6 Important Standards Issued by US FASB, AICPA, PCAOB & IASB in Relation to Fair Value Accounting and Auditing

In view of the issues highlighted in the preceding section, several accounting regulators and professional accounting bodies have come up with guidelines/norms in relation to auditing of FVMs in attempts to rationalize relevant audit procedures and provide them with a statutory backup. These assertions, obviously, enhance the reliability of the FVMs. The cardinal pronouncement in this regard in the United States is SAS No. 101 (AU Sec. 328, AICPA 2003). It provides for a general audit approach for FVMs and related disclosures. Although this standard does not provide specific guidance for auditing specific assets, liabilities, or equity items reported at fair value, it does contain a methodology for the audit of FVMs in general. This standard unambiguously lays the onus for making of FVMs on the company's management. It requires the entity's management to (i) establish accounting and reporting processes for determining FVMs, (ii) identify proper estimation procedures, (iii) report and justify any noteworthy assumptions used, (iv) formalize the valuations, and (v) ensure that FVMs reported together with disclosures thereon are in conformity with GAAP (AU Sec. 328.04, AICPA 2003).

The said standard also casts responsibility on the auditors (i) in Sec AU 328.09, to obtain ample knowledge of the processes and relevant controls in the entity for determining FVMs and (ii) in Sec AU 328.18 & 328.28, to assess whether the entity's approaches to computation of FVMs and significant assumptions are appropriate and are likely to offer a rational foundation for FVMs and associated reporting in the entity's accounts. It follows that the auditor must have knowledge and understanding of how a particular FVM should be (and has been) derived in order to determine whether the client's approach is appropriate.

Instances of audit pronouncements in the United States that apply to specific assets include (i) Auditing Derivative Instruments, Hedging Activities, and Investments in Securities, (SAS No. 92, AU Sec 332, AICPA 2000), (ii) Auditing Fair Value Measurements and Disclosures: A Toolkit for Auditors (AICPA 2003). The latter relate to FVMs required by FAS No. 141 (FAS 141, FASB, USA), Business Combinations, FAS No. 142 (FAS 142, FASB, USA), Goodwill and Other Intangible Assets, and FAS No. 144 (FAS 144, FASB, USA), Accounting for the Impairment or Disposal of Long-Lived Assets.

The International Standard on Auditing (ISA) 540, Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures (ISA 540, IASB) seems to be the counterpart of SAS No 101 in the IFRS framework. This standard sets forth the overall methodology for the audit of fair values and other estimates. This auditing standard is premised on the audit risk model. It stipulates that the auditor must lay emphasis during the course of his audit on aspects that involve a high probability of error or involve substantive subjective judgment or carry the possibility of biases and prejudices on the part of the estimator. In analogy with SAS 101, ISA 540 also requires auditors to obtain an understanding of the underlying methodology adopted by the entity's management for computing the FVMs. He must also scrupulously scrutinize the data on which such FVMs are based. This knowledge would enable the auditor to assess the chances of significant errors having crept into the FVMs. To facilitate this, auditors must (i) examine the internal control mechanisms in vogue in the enterprise in relation to FVMs, (ii) evaluate the underlying valuation models used for FVMs and test them for appropriateness, and (iii) check the assumptions that form the premise of the valuation model for an adequate representation of reality as well as for inter se consistency. Furthermore, in formulating his opinion on a particular risk scenario or stimulus, the auditor may also take account of events after balance sheet date. It would be more proprietary for the auditor to develop independent estimates of the relevant FVMs and then compare his own estimates with the corresponding values obtained by the entity's management (Kumarasiri and Fisher, 2011).

1.7 Problem statement and Research Question

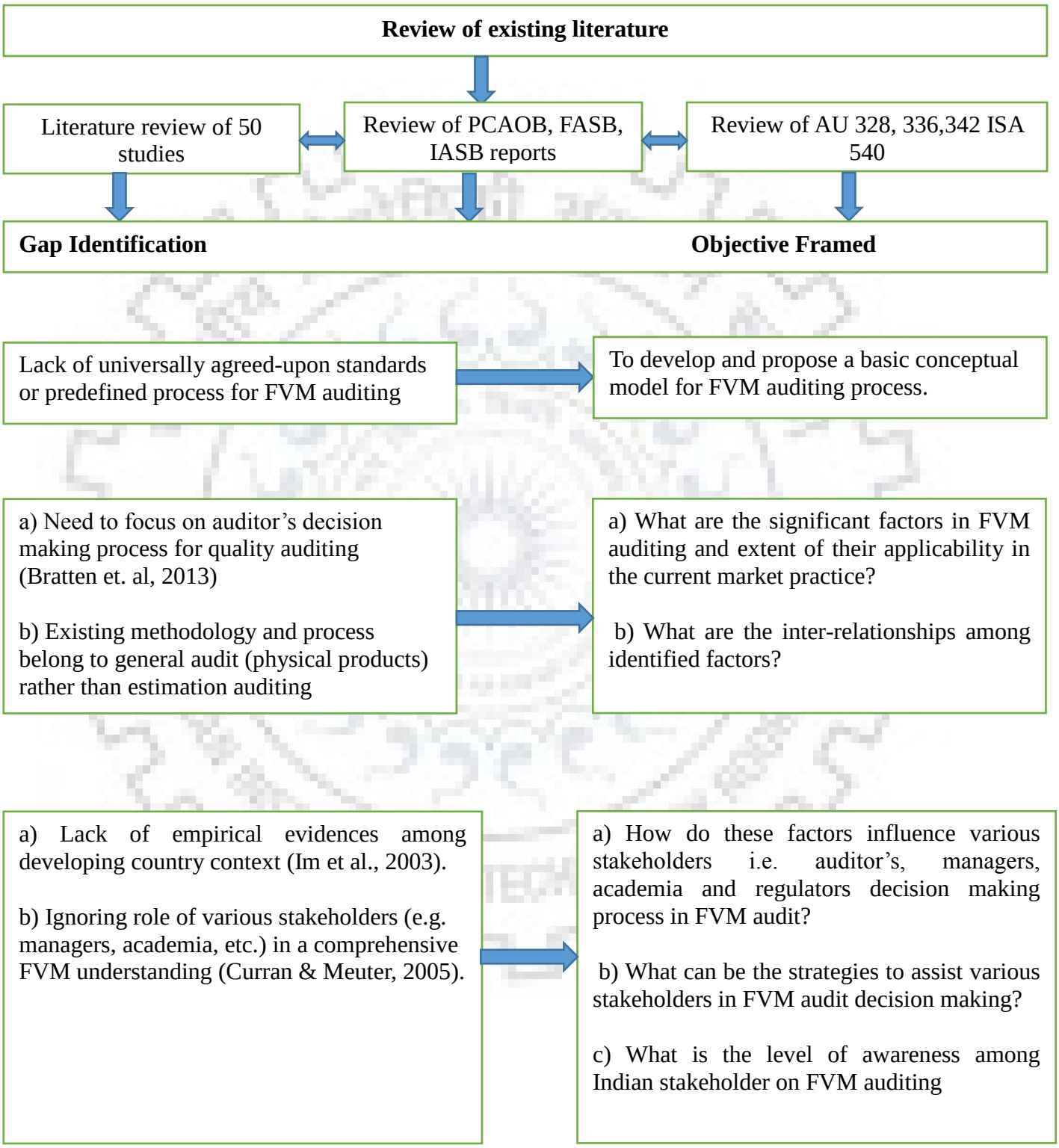
"Fair value accounting (FVM hereinafter)" is, undisputedly, here to stay. With its gradual capture of substantive territory from "historical cost accounting", it has, now, firmly entrenched itself to become the cardinal philosophy underlying the preparation and presentation of financial statements (Glover et al., 2014; Christensen et al., 2012). As the most sensitized professional accounting outfit, the Financial Accounting Standards Board of the United States has pioneered the enactment of Statements of Standard Accounting Practices (SFAS hereinafter) 133, 141,142 that are to be read with SFAS 157 ushering in an era of FVM.

The induction of these standards into the accounting manual is indeed welcome. Although several critical issues remain unresolved, a promising start has been made. FVM is being

perceived progressively as an indispensable device for marshalling in an efficacious set of accounting reforms. However, the concept is very much in infancy and faces various evolutionary glitches – it needs to be fostered by all its votaries. Many researchers have contributed under the umbrella of "fair value measurement or accounting estimates" (Herrmann et al., 2006; Penman 2007; Landsman, 2007; Hanna et al, 2007; Dechow et al., 2009;) and "Auditing" (Bell and Griffin, 2012; Christensen et al., 2012; Rasso 2015), but only a few have focused on the overall decision making process of auditors in FVM audit (for example Bratten et al., 2015; Doliya and Singh., 2016). For instance, some studies have investigated the implication of valuation specialist on FVM auditing (Joe et al., 2014; Griffith et al., 2015; Cannon and Bedard, 2015) while others have focused on the interaction between between skepticism and FVM auditing (Kadous et al., 2003, Glover and Prawitt 2014, Backof et al., 2014, Bratten et al., 2013). A segment of the studies has analysed the association of audit fee and fair value measurement (Goncharov et al. 2012; Mohrmann et al., 2013; Ettredge et al., 2014) while some studies have focused on the linkage between fair value measurement and presentation and format (Maksymov et al. 2012; Backof et al., 2014).

As established above, FVM audit become a tedious job for auditors, mainly because of the influence of numerous direct or indirect factors on the audit process and its outcomes. However, the researcher, in his review of extant literature, found that neither was there a study with focus on overall FVM audit process, nor on empirical identification of FVM audit process factors.

Therefore, the central research question of our study revolves around certain aspects: that relate to understanding the fair value measurement and auditing processes in the contemporary financial reporting scenario in the aftermath of the global convergence progression. Issues of erroneous and/or improper decision making in the audit process with dtastic repercussions are well documented e.g. Enron's case. This failure of precise and rational decision making provides the backdrop and the motivation for the study. Hence, a scientific and logical based approach towards improving auditors' decision making in complex audit situations is attempted. The following sub-questions are formulated for resolving the main question:


Review of existing literature
Literature review of 50 studies
Review of PCAOB, FASB, IASB reports
Review of AU 328, 336,342 ISA 540
Gap Identification
Objective Framed
Lack of universally agreed-upon standards or predefined process for FVM auditing
To develop and propose a basic conceptual model for FVM auditing process.
a) Need to focus on auditor's decision making process for quality auditing (Bratten et. al, 2013)
b) Existing methodology and process belong to general audit (physical products) rather than estimation auditing
a) What are the significant factors in FVM auditing and extent of their applicability in the current market practice?
b) What are the inter-relationships among identified factors?
a) Lack of empirical evidences among developing country context (Im et al., 2003).
b) Ignoring role of various stakeholders (e.g. managers, academia, etc.) in a comprehensive FVM understanding (Curran & Meuter, 2005).
a) How do these factors influence various stakeholders i.e. auditor's, managers, academia and regulators decision making process in FVM audit?
b) What can be the strategies to assist various stakeholders in FVM audit decision making?
c) What is the level of awareness among Indian stakeholder on FVM auditing

1. What are the significant factors in auditing of FVMs?
2. What are the inter-relationships among aforesaid identified factors?
3. How do these factors influence the decision making process of auditor's in thee fair value audit process.
4. What can be the strategies to assist the auditors' in FVM audit decision making?
5. What is the level of awareness among Indian auditors' on FVM auditing?

The answer to each of the sub-question will establish the research objectives of this dissertation and ultimately contribute to the integrated solution to the main research question.

1.8 Research Objectives

In light of the above-mentioned research questions, the following objectives are formulated:

1) To identify the various factors relevant in contemporary fair value auditing.

2) To prioritize the factors so identified on a scientific basis for an efficient auditors' decision making in fair value environment.

3) To establish various interrelationships between the factors identified above on a scientific and logical basis.

4) To facilitate a scientific and holistic presentation of fair value auditing attributes for auditors engaged in fair value auditing, as well as for standard setters and regulators.

1.9 Research Design

Kerlinger (1986) defined research design as "the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance". A systematic plan with robust structure complemented by an appropriate strategy (methodology) is a must for the study of research questions and objectives. Research design transpires at the start of research with different stages and associated activities (Babbie and Mouton, 2001).

In accordance with our first research objective, we attempt to identify the various direct or indirect factors that affect the FVM audit process. To serve this purpose, a close ended questionnaire based on extensive literature review and expert opinion was designed; the questionnaire used a five-point Likert scale with measures ranging from 'strongly disagree' to 'strongly agree.' After conducting pre-testing and pilot study, revised questionnaires were distributed to prospective respondents including Big4 auditors, Non-Big4 auditors, regulators, managers and members from the academia. Suitability and significance of the data and sample were determined with appropriate statistical measures (Cronbach's alpha and KMO). Next, Exploratory Factor Analysis (EFA) including principal component analysis (PCA) with Varimax factor rotation method was used to identify and explore significant factors in the FVM audit process.

The second stage of the present study aims to achieve second objective. To do this, we adopt the tools of multi-criteria decision-making (MCDM) viz. AHP to analyse FVM auditing and use Analytical Hierarchical Process (AHP) for prioritizing FVM audit factors and sub-factors. AHP is an attempt to decompose a problem into smaller hierarchical levels. Levels include goal or objective of the problem (top level of hierarchy), criteria (middle level) and sub-criteria (lowest level of hierarchy).

The third stage of the analysis focuses on the third objective of our study and analyzes an auditor's decision making in fair value measurement with Interpretative Structural Modeling(ISM). FVM audit process is a tedious job for auditors mainly because of the influence of numerous direct or indirect factors on the audit process and its outcomes. Bearing this in mind, ISM has been employed for studying and establishing relationships among the factors considered in this article. While discussing the interdependence of factors in the FVM audit process, an attempt has also been made to classify them as drivers (that affect others) and dependent factors (those affected by drivers).

1.10 Scope of Study

This study seeks to assist auditors during the FVM audit decision-making process and increase overall audit quality. Following are the broad areas of investigation that constitute the scope of the study:

1. Being one of the initial studies on FVM on Indian context (no previous work has been carried out on the topic in the Indian context), the present study makes an attempt to identify and explore factors influencing auditors' decision-making during the FVM audit process.

2. The study prioritizes and ranks factors influencing the FVM audit decision making process by using a new MCDM technique - Analytical Hierarchical Process.

3. This study also investigates and establishes interrelationships among the identified factors through interpretive structural modeling (ISM). While discussing the interdependence of factors in the FVM audit process, an attempt is also made to classify them as drivers (factors that affect others) and dependent factors (those affected by drivers)

1.11 Thesis Structure

The present study is structured in seven chapters.

Chapter One examines the theoretical underpinnings of Fair Value Measurement to unravel basic underlying concepts, definitions, associated systems and their peculiarities, and concerned theories. It highlights the change in auditors' functional domain, approach, methodology and responsibilities due to fair value measurement.

Chapter Two discovers how the global accounting convergence process has placed fair value measurement at the forefront of the international arena, and driven reforms and development of the auditing regulatory framework. A comprehensive literature review has been carried out to analyze lacunae in auditing fair value measurement emanated in the recent IFRS adoption to understand reactive approach to subsequent FVM auditing regulation.

Chapter Three includes a detailed description of the research methodology used for achieving the above-mentioned objectives. It informs about the data sample, and data collection and data analysis techniques used in the present study.

Chapter Four is empirical in nature and consists of the analysis carried out for the study. It includes identification of various FVM audit process factors based on multi stakeholder response.

Chapter Five develops a hierarchical ranking of the most influential factors of auditors' decision making process in FVM auditing**.**

Chapter Six establishes an interrelationship structure among the various FVM audit factors and determines drivers and driving factors of the FVM audit process.

Chapter Seven concludes the thesis with a discussion of results, implications, assumptions and limitations, and provides directions for further study (see Figure 1.2)

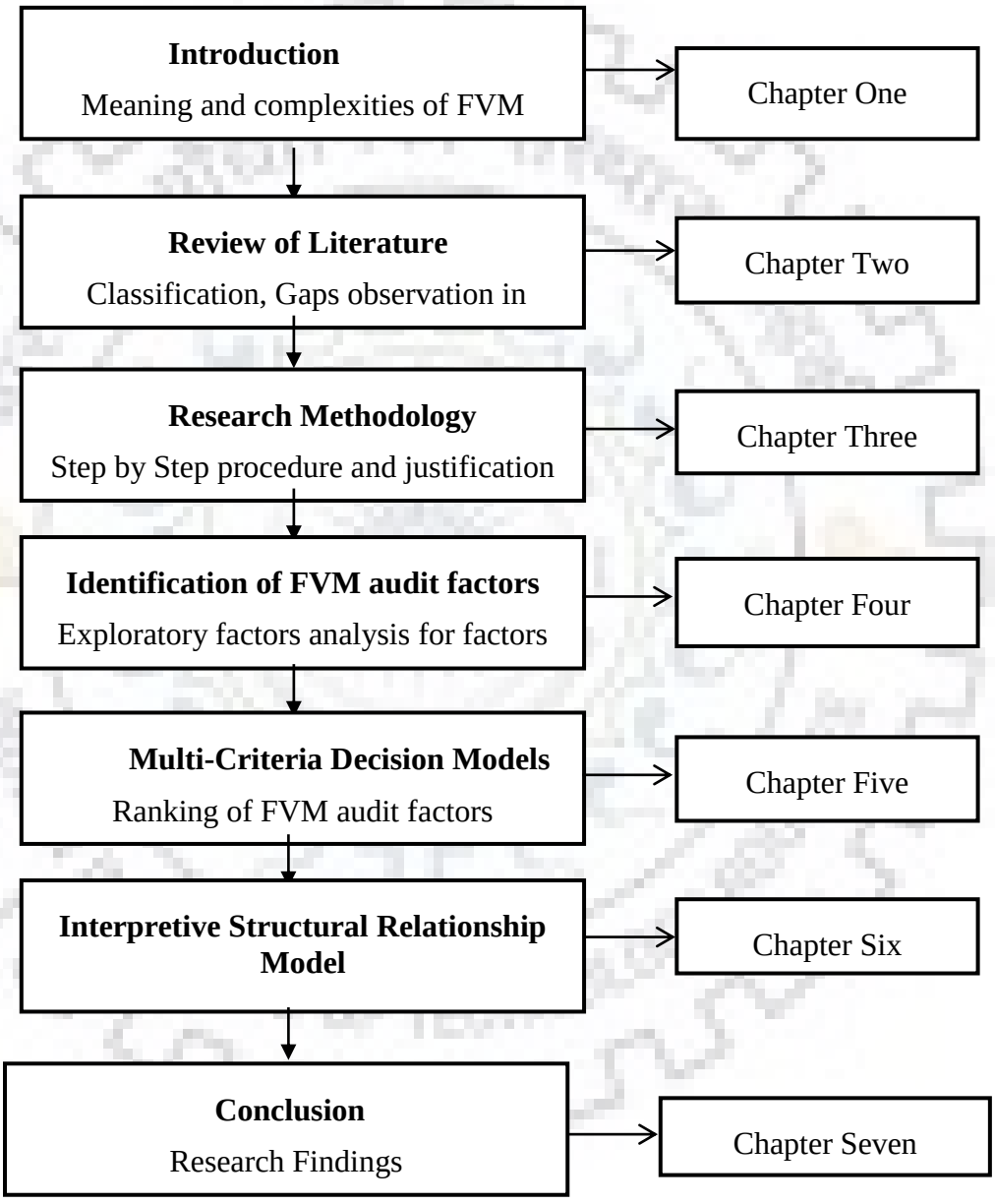


Figure 1.2 : Research Schema for this Research

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CHAPTER 2

REVIEW OF LITERATURE

Preview

This chapter present the comprehensive review of studies related to the auditing of fair value measurement. Further, a self-designed extraction model has used for finding the relevant studies among literature. Afterwards, a thematic analysis is performed and most relevant FVM auditing themes are discussed in details. Further, this chapter finds out the research gap based on existing literature and develops a theoretical framework for the present study.

CHAPTER 2
REVIEW OF LITERATURE

2.1 Introduction

In last few years, accounting and auditing profession witnessed rapid changes in measurement process, reporting systems and auditing guidelines. Although most of these changes lead to higher transparencies and reliability in financial statement, but few of them become highly controversial too. One of the prime accuses is "fair value measurement (FVM)" that is termed as one of the most "debatable" accounting standard in history. Fair value measurement is a complex topic and has been studied by different researchers from different viewpoints. Both academic and professional research has rapidly increases in FVM after the 2008 economic crisis (Kolev 2008; Dechow *et al.,* 2010; Barth and Taylor 2010). However, most of the FVM literature limits itself only to the capital market perspective (Barth 2008), research directly examining FVM from an auditors perspective are very limited (Martin *et al.,* 2006). Auditor's perspective on fair value is extremely important since after 2008 economics crisis lot of fingers raised on auditor's approach. Since 2008, regular adoption of FVA by accounting regulators (FASB, IASB) across the world contributed a large number of new methods, ideas and literature in this area. Therefore, we think a systematic literature review is necessary to assess "architectural blue print" for consolidating the recent research efforts in this area (Gupta *et al.,* 2016).

2.2. Literature review

In order to assess the body of literature, an information search made on five computerized academic databases viz.(i)ProQuest ABI/INFORM, including the Dissertations & Theses database, (ii) Thomson Reuters (formerly ISI) Web of Knowledge, (iii) Google Scholar, (iv) JSTOR, and (v) SSRN, which together cover the majority of the published literature in FVM auditing. Moreover, to include the maximum number of studies a backwards and forward trace of all references in the identified articles is made using Google Scholar, SSRN, and Web of Knowledge. In addition, the authors consult the contents of major journals in accounting and finance, as well as contact researchers to ask if any unpublished research existed that had not been included (Tosi *et al.,* 2000). The key words used for this search were "Fair value auditing", "Estimation audit" and FVM Auditing. After a careful analysis of all the collected studies, we choose studies published from 2004 to 2016 .From our research, we attempted to answer the following questions: 1) what are the most

challenging areas in Fair value Audit. 2) How did auditors approaching to these challenges. 3) What are the most significant factors in FVM audit process?

Afterwards, for primary data collection a specially designed data extraction model is used and classified according to the nature of literature. Collected data comprise the details regarding title, author, methodology, citation, year of publication and core focus area (Gupta *et al.,* 2009). All quantities and qualitative study appraise on different criteria, for qualitative study Pope and Mays (1995), guidelines are followed and special focus is made on sampling strategy, reliability and validation of results. For quantitative study, special focus was the population and methodological quality (Humphreys *et al.,* 2006). A total of 195 papers was identified from the literature that has some association with fair value accounting. Afterward, duplicates results were removed and citations were assessed against inclusion criteria, 80 studies were retrieved for possible inclusion, of which 50 actually met the inclusion criteria (see Fig. 2.1)

2.3. Inclusion criteria

- Articles that have been published in accounting or auditing related journal were selected for further research because these articles were most resemble to our objective;
- Working paper that referred in citation of major accounting journal,
- Studies that evaluate different aspects of the FVM auditing process such as skepticism, valuation specialists and audit fees etc.

2.4. Exclusion Criteria

- News and magazine article,
- Study published in other than the English language;

As per our knowledge, previously there is only one study that synthesizes the FVM auditing literature (Martin *et al.,* 2006). However, that was limited towards the errors identification in the FVM audit process. Martin *et al.* (2006) included the studies until 2006 only, while the majority of academic literature on FVM auditing was published during 2011 to 2015 and their work is more inclined towards individual auditor specific issue in FVM auditing i.e. overconfidence, Reiteration Effects, Confirmation Bias, whereas our study focuses on overall FVM audit process and includes literature on audit fees, valuation specialist and presentation and format, etc. Thus, we can say that present chapter is an extension of work done by Martin *et al.* (2009) and tries to fill the gap existed in the literature.

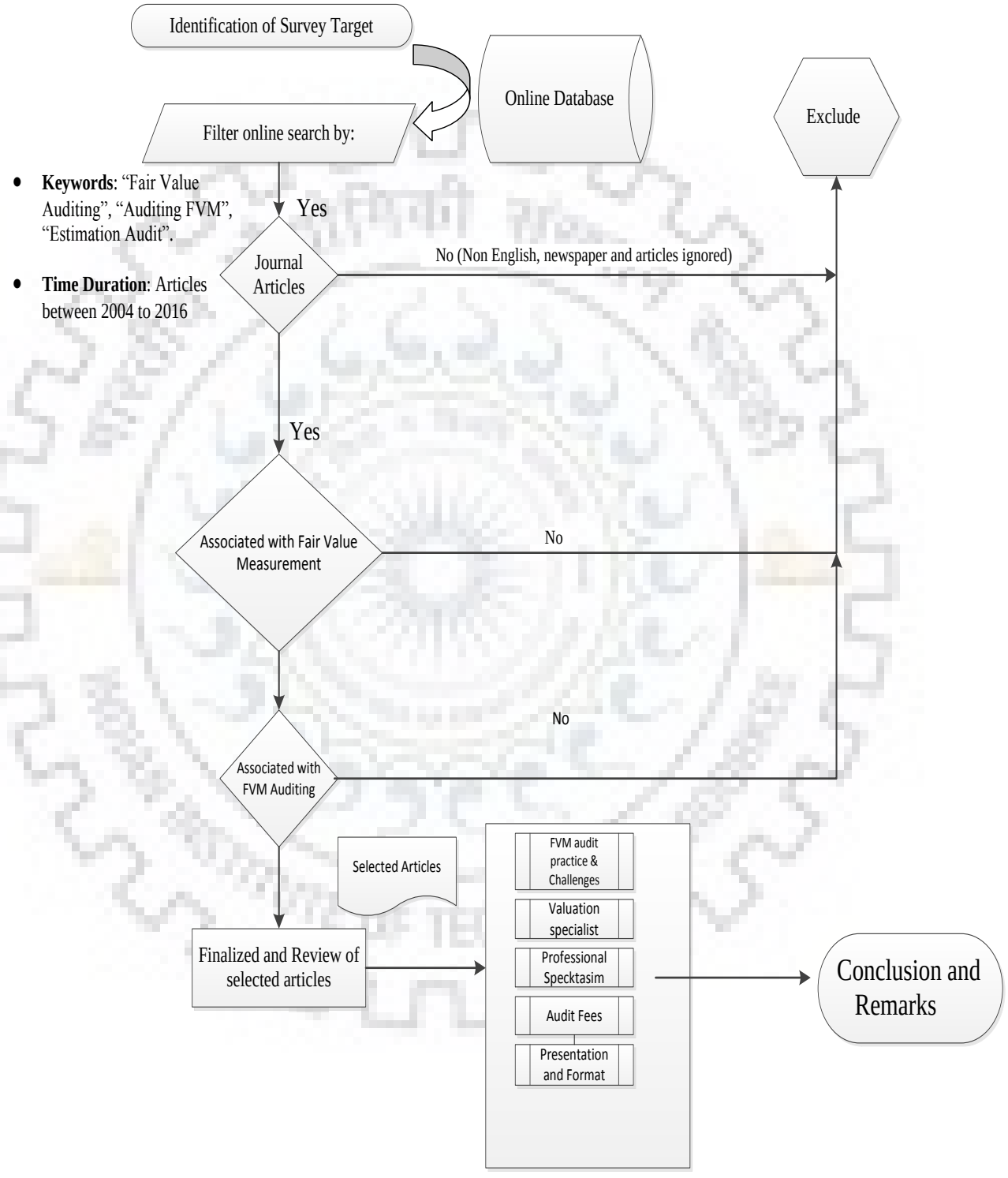

Figure 2.1: Extraction Model for selection of Studies.

2.5. Literature review classification

In spite of the large literature focused on the pros and cons of fair value accounting, there is only a limited amount of research has focused on fair value auditing. Particularly in academic research, these areas are relatively sparse as compare to other areas (Bratten *et al.*, 2013). But in the last 2 years, research examining FVM auditing increased rapidly. While discussing the literature review, we also classified the literature in different themes that is discussed below:

2.5.1 FVM auditing practices and challenges

A study involving interviews of 24 experienced U.S. auditors found that two cardinal issues (Griffith *et al.*, 2015) critically influenced auditing of FVMs; viz. (i) the complexity of FVM auditing related standards and (ii) the various management estimation models and all practice and procedures directly imported from another area without specific adjustment. The respondents in this study advocate the development of new methodologies (that depend less on management estimation) and recommend institutional changes for improving the overall audit performance in FVMs. In another similar study, Glover *et al.* (2014) identified three key challenges faced by auditors in the audit of FVMs viz. (i) lack of verifiable tangible evidence for supporting the valuation amount of accounts; (ii) difficulty in establishing the reasonableness of managerial assumptions; (iii) excessive subjectivity in evidence provided by the management in support of their estimates of fair value. In essence, it is, now, widely believed by stakeholders and practitioners alike that "the auditor's functional domain, his approach, methodology and responsibilities are undergoing a metamorphosis with the adoption of FVA and his role is moving away from a mechanized attester of tangible evidence to one that exercises a substantively judgmental function in a holistic assessment of values ascribed to be fair by the entity's management" (Singh and Doliya, 2015). Glover's study also enlightens on the challenges faced in the auditing of FVMs of financial instruments as against those faced while auditing non-financial assets/and liabilities. An extended empirical study on similar lines as Glover's in relation to challenges faced by Sri Lankan auditors in the audit of FVMs has also been reported (Kumarasiri and Fisher, 2011). A majority of responses obtained from a set of 24 chartered accountancy firms of Sri Lanka, strongly support the rationale of using FVMs but acknowledge the increasing complexity in their audit.

In another empirical work, Cannon and Bedard (2014) focused on the same issues and studied the major challenges faced by auditors and preparers of accounting statements in fair value environment. They also concluded that complexities in managerial assumptions, elevated subjectivity of evidence, and high degree of uncertainty constituted the major hassles for audit in fair value environment. Moreover, FVM is computationally complex and non-intuitive because of its dynamic nature (Gupta and Dutta, 2011)

Hammersley *et al.* (2016), while discussing the difficulty of assumption evaluation find that auditor' tendency to support management's accounting and reject evidence that contradicts management's assumptions is a prime reason for error in FVM audit process. They find that auditors with "preference inconsistent documentation" and "stronger accuracy goals" will improve the auditor's evaluation of persist to improve auditors' evaluations of biased estimates. Emett *et al.* (2016) highlight the potential deficiency in PCAOB audit regulations related to FVM auditing. They found that auditors make different adjustment decisions for investment portfolios with the same amount of aggregate overstatement, depending on the distribution of overstatement within the portfolio and their clients' preferences. The impact of uncertainty and disclosure in fair value environment and the consequential audit challenges were the subject matter of an empirical study by Jeremy B. Griffins (2014). Both side manipulation i.e. input subjectivity and outcome imprecision was adopted in this study to assess the impact if uncertainty on audit. It was observed that whenever subjectivity and imprecision were both high, auditors are likely to take recourse to clients opinions to adjust fair value estimates. The psychological aspects of judgment and decision making of auditors doing audit of fair value based accounts was explored in a conceptual study (Martin *et al.*, 2006). The study highlighted the various obscurities associated with the audits of fair values. Prominent existence of confirmation bias, motivated reasoning, volatile nature and lack of training were believed to lead to inconsistencies in fair value estimation and ascertainment. Auditor's limited knowledge about the account characteristics, overconfidence in his own ability and too much dependency on third party are further causes of inaccurate ascertainment of fair values of accounts.

In another intriguing study the behavioral and jurisdictional cost of audits of FVMs was explored (S.Lacroix *et al.*, 2011), This is a cardinal dimension of auditing, particularly in context of the practical implementation of the fair value philosophy and the consequential standards. Primary data collected from a set of Canadian chartered accountants revealed that fair value accounting has made it "harder for auditors and they are losing belief in their own expertise" (S.Lacroix *et al.*, 2011). The

study investigators, accordingly, recommended for domain expansion of the professional auditors even if it comes at the cost of technical competency. A related study espoused the need for a change in the auditors' mindset while conducting fair value audits based on an analysis of some specific errors committed by the auditors in course of auditing FVMs (Griffith *et al.*, 2015).The study investigators also inferred the need to adopt a pragmatic approach in collecting evidence from various sources. They concluded that critical thinking is the key for successful FVM audit and auditors should focus on "out of box solutions" rather than depending on counting of evidence. The more experienced and knowledgeable auditors were better able to take the benefit of the deliberative mindset. Realizing the challenges faced by standard-setters, auditors and preparers of accounts in relation to fair value estimation, Bell and Griffin (2012) published a commentary on these aspects. They recommend adoption of a rational approach to fair value measurement while considering all relevant assumptions and uncertainty and present an effective accountability framework in fair value accounting. They propose the need for additional disclosure related to managerial estimations. The authors also phrased a modified audit report that reports only negative assurance for measurement uncertainty.

Abdullatif (2016) studied FVM audit challenges in developing countries context and find that lack of sufficient reliable information, regulatory scrutiny, and excessive pressure from client is main challenges for auditors in Jourdan. Pannese and DelFavero (2010) performed another study that focused on various issues relating to the audit of FVMs and found nine aspects that differentiated audits of fair values from conventional audits that includes overly conservative nature, lack of FVM education and training, opportunity for managerial manipulation, and inadequate verifiability issues etc. Issues of the PCAOB expectations contrasted with auditors' performance were examined by Glover *et al.* (2015) and questions were raised on the attainability of PCAOB expectations in real life audits in fair value environment. Measurement uncertainty was believed to widen the gap between auditor's performance and expectation. The study also inferred the overly cautious nature of PCAOB monitors who demand for more evidence than actually is required by the auditing standards. It was concluded that current PCAOB mandates lack clear guidelines regarding FVM treatment. The study strongly recommended issue of specific instructions from PCAOB especially for FVM audit procedures and documentation.

The FVM audit and judgment process was also examined in Bratten's extended study (2013). This study examined the three factors of judgment (environment, task and person) given espoused by

Bonner (2008). The reported findings indicate that fair value audit required more of financial and economic skills than accounting. It was also found that most of the auditors were not comfortable in choosing a valuation approach for measurement. As regards to audit standards, it was felt that most of auditing standards lack clear guidelines that resulted in proliferation of formal and informal guidelines leading to increased difficulties in task structuring. The findings reported in Bratten *et al.* (2013) seem to reiterate similar observations made by Christensen *et al.* (2012) who explicitly report that, "small change in estimation assumptions will lead to huge changes in material income". Highlighting the unrealistic expectations of PCAOB, Christensen *et al.* note that convergence of IASB and FASB auditing standards hamper the auditor's ability to a great extent. Using the Wells Fargo example, the study displays how a small change in management assumption leads to massive changes in accounting values and/ or in reported income. The study also questions the ability of the audit report to convey FVM results and recommends changes regarding assurances related to FVM in audit reports.

In another interesting study, Kohlbeck *et al.* (2009) used Roman holiday Pizza Paradise Corporation to illustrate the auditing fair value measurement process and challenges for auditors. Doliya and Singh (2016) discuss the various interrelationship between factors of FVM audit process and their affect the auditor's decision making. They used Interactive structural modeling (ISM) to establish the relationship between factors of FVM audit process and find driving and dependence drivers of auditor's decision making. Brink and Tang (2016) illustrate an experiment to investigate the impact of interaction between estimate source and social pressure on auditor's fair value estimation process.

2.5.2 Professional skepticism and FVM Auditing

Professional skepticism is considered as one of the cardinal factors in the auditing process. There has been considerable debate in the last few years about its role in the audit of FVMs (Glover and Prawitt., 2014 Backof *et al.*, Bratten *et al.*, 2013). The definition of "professional skepticism" has also been debated in the literature from a "neutral factor" (Hurtt, 2010) to "presumptive doubt" (Nelson, 2009) and to a "conservatism bias" in audit judgment (McMillan and White, 1993). PCAOB's pronouncements also define professional skepticism and refers it is as "an attitude that includes a questioning mind and a critical assessment of audit evidence (AU 230.07)".

Taking into account the significance of this issue in the audit of FVMs, Jason Tyler Rasso (2014) studied professional skepticism by using a judgment framework that allowed gathering and

verification of auditing proof with broad guidelines. For setting up the judgment framework, this study uses two levels of construal (Trope and Lieberman, 2010) viz. high-level and low-level. It reports that there is positive relationship between construal and professional skepticism. Whenever auditors use high level of construal (broad Guidelines), they tend to use more skepticism in FVM audit and whenever they adopt low level of construal (narrow guidelines) professional skepticism is reduced substantially. It is also inferred that most of the current auditors use low level of construal that results in inferior audit quality.

Using low level of skepticism in audit, when standards are too precise in nature has come in for sharp criticism by PCAOB (PCAOB, 2003). Other studies from the shortlisted literature (Nelson 2002, 2003; Tarpley, 2002) question the auditor's role in high level of construal. Contrary to this, some other studies (Kennedy, 1995; Kadous *et al.*, 2003) find that auditors take advantage of standard ambiguity and typically support management's adopted estimation methods. Apparently, it seems that enhancement in auditors' skepticism at both high level of construal and low level of construal is called for. Because of their complexity and ambiguity in valuation fair value required the development of new methodology for effective FVM audit (Petrovic, 2015; 2016). Another study reached similar conclusions as above while highlighting the auditors' failure to use of professional skepticism in fair value measurement efficaciously (Backof *et al.*, 2014). This study developed and tested the extent to which a simple intervention (considering both consistent and inconsistent management assumptions) can help at enhancing auditors' skepticism in the audit of FVMs. The study advocates going for the "how" question rather than "why" in FVM audit. Explaining this philosophy, the researchers believed that "why" result in more of common features of audit and auditors will end up with a very abstract idea about audit evidence. In contrast "how" would include more of detailing about the process (hypothesis development, collection and analysis of result), leading possibly to hidden information, which would result in enhancement of skepticism and audit quality. Cohen *et al.* (2016) suggest balanced (support and oppose management's assertions) audit guidelines to enhance the level of professional skepticism in audit of fair value estimates. They find that balanced approach promote the higher rate of opposition to managerial estimations, which result in greater risk of material misstatement and more skeptical auditor judgments.

In another study on FVM audit, Glover and Prawitt (2014) identified different levels where professional skepticism could be applied and made several suggestions that would help in application of professional skepticism. The study proposed a "skepticism continuum" that involved use of

different perspectives in different situations. Such skepticism continuum was stated to be able to provide great help in FVM audit as such audit involved a large number of assumptions and estimations that varied in different situations. The study breaks the structure into different categories (engagement team, individual auditor, audit firm & overall audit profession) that every audit decision should affect at different levels.

Consistent with previous research, Nolder and Kadous (2014) acknowledged skepticism as a fundamental ingredient of audit process, which is still ill defined in literature. The study, first, develops a definition of professional skepticism based on attitude and then performs its empirical testing to design Judgment and Decision Making (JDM) Research Framework. Contrary to this, while studying the Audit judgment rule in Australia Kang *et al.* (2015) discover that it may enhances the perceived accountability for audit committee and promote the creative auditing methodology but it does not necessarily that it increase the auditor's skepticism level. Hurtt *et al.* (2013) have expanded the Nolsan (2009) work and have synthesized relevant research on professional skepticism. The said researchers conclude that skepticism plays an important role in auditor's decision-making process. They, further, find that most of the skepticism literature focuses on auditors' judgment process whereas standard setting bodies (PCAOB and SEC) are more concerned with auditors' actions. They have identified various causes like auditors behavioral characteristics, unconscious bias, lack of knowledge for this gap and recommended some more research in auditors' action in response to stimuli. Kadous and Zhou (2016) reveals the significance of intrinsic motivation in enhancing the auditor's level of skepticism in complex accounting system such as FVM. They further claim that that auditors with salient intrinsic motivation makes better judgments about a biased complex estimate as they use information cues that require higher levels of cognitive processing to attain. Recently Lherm (2016) suggest that auditor's should focus on obtaining the sufficient appropriate evidence for assessment instead of attempting to assure estimates based on evidence. They use Jurisdiction of Comfort (Comfort alone choose the reasonableness) theory for demonstrating the auditability beyond conformity concept and highlight the need of right condition for auditing instead of mere regulator and ethical pressures.

2.5.3 Valuation Specialist

Inherent estimation uncertainty, varied assumptions and different valuation models make FVM auditing one of the most challenging jobs for auditors. To combat these impediments to a reliable

audit, and to deal with the nuances of fair value based valuations, many of the audit firms engage third party valuation specialists. PCAOB auditing standards recommend application of specialist (tax specialists, valuation, forensic, or information technology specialist) in complex or subjective matters potentially material to the financial statements and require special skill or knowledge for evaluation (PCAOB 2003). With the greater spotlight on the quality of auditing and consistent rise in risky and complex estimates, the requirements of 'valuation specialists' in audits has increased in recent years (PCAOB 2009).However, PCAOB inspection reports (2011, 2013) found numerous deficiencies in the audit of FVMs and highlight that too much reliance on third party valuation specialist constitutes one of major drawbacks of FVM audit (Bratten *et al.*, 2013).

Carpentier *et al.* (2008) studied use of third party valuations for audit of FVMs and question the ability of valuation specialists to provide reasonable valuation assessments. The study finds that different knowledge and independent observer leads to different valuation measurement for same investment. It, further, confirms the Barth (2007) result and reiterates the verifiability (or the lack thereof) issue in fair value measurement, especially in level 3 valuations. A study, on the role of valuation specialists in audit of FVMs, tested the impact of third party specialists on auditors' decision making progress (Joe et al, 2014). The study reported that when client risk is higher, audit process is negatively correlated with the valuation specialist quantification report. Explaining it further, the authors concluded that whenever specialist reports have high level of quantified data, auditor performed very few audit procedures and vice versa.

Glover *et al.* (2014) differentiates between use of in house valuation specialists and third party valuation specialists in FVM audit. They find that more than 87% of auditors use different pricing service than management, which makes investigation of "how" question very difficult in FVM. This study reconfirms the finding of Cannon and Bedard (2014) that highlighted the difficulties in evidence collection to support FVM assumptions.

Another study by Griffith *et al.* (2015) explores the conditions under which valuation specialists can enhance the auditor's performance. The study finds that when auditors perceive low source credibility and receive caveats from specialists, they tend to focus more on valuation assumptions and raise strong concern against biased estimations. Notably, auditors raise concern only when credibility of sources is low, In case of high source credibility, typically, auditors tend to ignore specialist warning. These findings suggest that source credibility and valuation specialist's warnings, taken together, can improve the auditors' judgment process. Brown-Librd *et al* (2014) focused on a

different dimension of FVM audit and studied the effect of valuation specialists on internal control effectiveness. There is very limited research available in the literature on internal control (Martin *et al.* 2006). The work of Brown-Librd *et al.* is an attempt to fill up this gap. The study uses the Heuristic-Systematic Model (HSM) for predicting auditors' judgment process in FVM and third party valuation effectiveness on internal control. It finds that the auditor perceives lower FVM risk for level 3 assets only when internal control is effective. The study, further, concludes that auditors dedicate very limited time on verifiably and show belief in client's management information systems in the absence of suspicious stimuli.

Boritz *et al.* (2014) performed comprehensive study on role of specialist in auditing and investigate the current state of specialist use, sources of conflict, auditors' overconfidence, and difference with firm policies. Although they include different type of specialist i.e. information technology, forensic, tax and valuation specialist, but their finding on management attitude towards specialist, cost of specialists, levels of bias between auditors and specialists and differences between auditors and specialists approach despite shared training is highly significant in FVM auditing.

2.5.4 Audit fee

Audit fee can be termed as the degree of financial measure of the auditor-client relationship. A study by Goncharov *et al.* (2012) probes the attributes that form the basis of determination of audit fees in the case of both the reporting models i.e. fair value and depreciated cost. The findings of this study indicate that the firms based in the United Kingdom, which are required to report the property assets at fair value, have significantly lower audit fees relative to the firms of United States that are mandated to report the property assets at depreciated cost. The main aspect of this difference in audit fees is impairment.

Ettredge *et al.* (2014) explore the linkage of audit fees with the fair valued assets at different levels of inputs proportionally held by the banks. Results of these studies reveal that fair-valued assets based on the Level 3 inputs have positive and significant coefficients whereas, fair-valued assets measured on Level 1 and Level 2 inputs have relatively greater coefficients in the audit fee model. The findings also suggest that the experts or specialist bank auditors charge lower audit fees on average relative to the non-specialist auditors who seem to charge higher audit fees from their bank clients. Mohrmann *et al.* (2014) link the abnormal audit fees and audit firm size with the fair value disclosures and market valuations. They infer that higher proportions of Level 3 assets in the audit

fee model lead to higher audit fees. They conclude that market value differs at different levels depending on the model specification and audit firm size. Recently, Kohlbeck *et al.* (2016) find that auditors charge higher audit fee and attempt to restrict transfers of input into the Level 3 of FVM hierarchy to manage the risk associated with it. Further, Yao *et al.* (2015) use a sample of 300 companies to provide evidence on positive association between FVM of noncurrent assets and audit fees. However, contrary to earlier research they found that costs associated with fair value estimates (especially agency) compensate the fair value measurement benefit. In continuation with earlier research Alexeyeva and Mejia- Likosova. (2016) uses sample of 177 banks from 24 European countries to show positive association between fair value measurement and audit fees. Further this study also highlights significance of strong institutional framework in evaluation of higher uncertainty fair value inputs.

The very recent study conducted by Ghosh *et al.* (2016) use goodwill impairment to illustrate the positive association of fair value and audit fee. They find that auditors charge a substantial fee premium for testing goodwill account balances and there is an auxiliary fee surcharge for impairments, restructuring and other types of special charges. Cameran and Perotti (2016) shed some light on role of auditor's effort and quality of financial reporting on audit fee. They argue that the fair value oriented standards implies greater effort for auditors; which will increase higher fee.

2.5.5 Presentation & Format

Financial reporting statements works as a means of communication to transfer financial information from managerial level to different stakeholders (Goel, 2013). However, as discussed earlier, it is very difficult to measure fair value input objectively, so it becomes difficult for the user to accept with reliability the fair value information in the balance sheet (Landsman, 2007). FASB and IASB have pronounced additional disclosure requirements to resolve this issue, but effectiveness of these mandates is still questionable (FASB 2007, IASB 2011). Clor-proell *et al.* (2014) focus on similar issues and attempt to find the impact of change in presentation format on the users' FVM understanding. They use different levels of information i.e. one set with higher salience and other one with low level of salience. The findings indicate that the user would better understand the information in higher level of salience than in lower level of salience. The study also concluded that separation of financial information in different columns has positive effect on users' judgment process.

During an interview with Heffes (2005), Robert Herz than FASB chairmen acknowledged the issue of information overloads and recommended using alternative ways for information presentation than simply using additional disclosures. Another study by Backof *et al.* (2014) studied the effect of presentation format on auditors' skepticism and found that the nature and format of evidence provided by the management to the auditor significantly affected auditor's skepticism. They use one hundred fifty-four (154) practicing audit managers & partners as participants and found that auditors are less skeptical when evidence is presented in text format than as graphics. Amit *et al.* (2009) in psychological research also suggested that information presentation affected conceptualization and processing of information. Maksymov *et al.* (2012) manipulated framing of procedures to check its impact on auditing and found that auditors devoted most of their time on negatively framed questions and less on positively framed ones. They find that framing and pressure of efficiency do not affect auditors" estimates of achieved audit risk. Interestingly, they also discover that auditors are not aware how frame (Positive or Negative) affects their decision making process.

Research by Cohen *et al.* (2016) also provide evidence on effect of different audit guidance frames (Positive or Balanced or Negative) on fair value estimates. They revealed that using a balanced frame instead of positive or negative will be more effective in generating lower fair value estimates. Dennis *et al.* (2016) highlight the significance of visual cues for nonprofessional investor and finds that nonprofessional investors prefer auditor disclosures with visual cues instead of a fully-narrative format. They also compare the nonprofessional investor's response towards supplemental management disclosures and fully-narrative auditor disclosures and finds that former acts like a substitutes for communicating the information about underlying material measurement uncertainty to investor.

2.6 Discussion

After reviewing a final set of 50 papers, we identified five distinctive themes (Auditing issue and challenges, Valuation specialist, Professional skepticism, Audit Fees and presentation and format) from FVM literature. We found that despite the heterogeneity of "focused areas" and "methodology used" in these studies, it was clear that literature still inclined more towards auditing challenges and issues (Bratten *et al,* 2013). This also exhibit the poor level of education and training of auditors, when it comes to FVM auditing. Majority of auditors either does not have specific training required for fair value auditing or they lacks in basic skill of economics and mathematics those are the fundamentals for fair value auditing. Further institutional mechanism in developing countries market

does not have ample depth to provide reliable FVM related information (Lukose and Rao, 2007, 2010), so auditor's job becomes more difficult. Subjectivity in managerial assumption, verification of audit evidence, presentation and formatting, etc. also enhance the FVM audit complications. Not just auditors and their decision making process, there are still some areas where fair value measurement itself is questionable, either for its ambiguity (intangible impairment and derivative) or its complex valuation process which required high level of specialization. To overcome all these auditing challenges we advocate for combined efforts from accounting bodies, whether at supervisory level or at standards formation level. For enhancing the awareness and technical knowledge related to fair value, constant changes are also required in the pedagogy of professional accounting bodies imparting accounting and auditing education. Further, interpretive systems approach from management are required to wrestle these FVM challenges (Petrovic, 2014).

Professional skepticism was a particularly prominent theme which influences the auditor's decision making progress (Glover and Prawitt 2013, Backof et.al, 2014). Earlier literature has a lot of debate on definition and how much level of skepticism required in FVM audit process. However, ignoring all these concepts and application differences, one thing is unanimously agreed by everybody that skepticism is a major contributor in auditors decision making progress. However, as we discussed in first half of paper most of auditors fail to use it appropriately in FVM audit, either because they do not understand the concept of skepticism in audit process or its very difficult to implement for general auditor. Our synthesis support Nelson (2009) finding and advocate for "experienced auditors" for proper use of skepticism in FVM audit process. Nelson (2009) concluded that experience of error and non-error evidence pattern could help auditor in using proper skepticism in auditing process. Experience whether it is general experience, task related, role related or industry related help in enhancing the skepticism in FVM audit. Proper training and motivation can also help in maintaining the optimum level of skepticism in FVM audit. Our analysis highlights another important theme from literature that is use of valuation specialist in FVM auditing. We include studies from literature that covers various dimensions on use of valuation specialist in FVM auditing. Inherent estimation uncertainty and complex valuation process generated the need of a valuation specialist in FVM auditing. Further, Job of a valuation specialist required a different set of knowledge (economics, mathematics modeling) and training compare to general audit (accounting and auditing).

Specifically for fair value measurement purpose auditors are heavily depends on valuation specialist. However, valuation specialist is far from being panacea of all evil of fair value accounting. Barth (2007) and Carpentier *et al.* (2008) found that different valuation specialist provided different result for same investment that leads to inconsistency in financial reporting.

Another significant theme identified during analysis is "audit fees". Like every other business activity "consideration paid" plays an important role in fair value audit. However, contrary to other FVM themes, there is very few study in literature that focused on audit fees. Goncharov et. al. (2012) studied audit fess relationship with fair value reporting and found that companies reporting assets at fair value (UK) has substantially less audit fess as compare to those who reported at depreciated cost. Other then this few more studies found association between audit fess and fair value measurement such as Mohrmann *et al.* (2013) with investor perception, Michael *et al.* (2014) with fair value input hierarchy. Our synthesis found that research on association between audit fees and fair value measurement is still at introductory stage. There are very limited studies in literature that directly focused on relationship between fair value and audit fess. With regard to the future research our study recommend for interrelationship study between audit fees and other FVM factors such as whether inclusion or exclusion valuation specialist in FVM process affects audit fess, or changes in audit fess affects audit skepticism negatively or positively.

In the end, we identified presentation and format as another major theme in FVM audit. Presentation and format of financial statement is one of one of most cardinal factors of financial reporting, as this is work as interface between the companies and its stakeholders. However, academic research focused specifically on this particular area is very less as compare to others. Clor-proell *et al.* (2014) studied the impact of fair value measurement on presentation and format and provide useful insight regarding optimum level of salience and on affect of one additional column in financial statement. Maksymov *et al.* (2012) studied impact of framing (negative or positive) on auditor's decision-making. Presentation and format also affect level of skepticism used by auditors in auditing process (Backof *et al.*, 2014).In our synthesis we found that earlier literature on presentation and format in FVM audit covers only few specific dimensions of FVM auditing such as affect on skepticism, adding up extra disclosure etc. Our research support clor-proell (2014) finding and recommended further research for analyzing the impact of salience on users' ability to detect measurement changes and impact of classification difference on financial statement numbers. Other than these, future

research can also analyze the impact of presentation format on different stakeholders (users, managers, auditors) decision-making process.

2.7 Key observations and gaps from the literature

Using a systematic and comprehensive review of literature on FVM audit process, certain gaps have been identified. These gaps prove that there is significant scope of research, specifically in the auditor's decision making process in FVM audit process. Following are some key observation identified from the literature review:

- Fair Value Measurement is one of most complex and significant issue in contemporary accounting scenario, which required greater attention from both academician and practitioners

- Literature in the area of FVM auditing is relatively low. The majority of FVM studies on capital market perspective of fair valuate (Barth *et al.,* 2001; Wallison, 2008, Song *et al.,* 2010). There is still a need to go beyond the emphasis on value relevance and information relevance in FVM literature (Cannon and Bedard, 2016; Doliya and Singh, 2016).

- Analysis of literature shows that developed countries have contributed more towards FVM auditing research, very rare studies are seen from developing countries which specifically focused on FVM auditing.

- The measurement/understanding of the FVM auditing have been viewed by researchers based on the incidences/cases resulting from various challenges in FVM auditing, as a result they suggested varied factors for FVM audit process. It is seen that subject has not viewed from holistic approach. Hence, a clear gap is visualized toward exploring the subject with an integrating perspective.

- There are numerous significant factors in FVM audit process such as estimation uncertainty (Christensen *et al.*, 2012), regulators (Glover *et al.*, 2015), audit fee (Ettredge *et al.*, 2014) and skepticism (Glover and Prawitt 2014) etc. that have been identified and examined. However, the findings still lack a degree of clarity in their role in decision making (Doliya and Singh, 2016).
- More studies are required to overcome various criticisms of auditor's decision making in FVM audit process, such as its questionable skepticism application, limited explanatory and predictive power, ambiguity, and lack of desired training and education (Bratten *et al.*, 2015).

These observations and gaps helps in deriving the following key research question which seek attention in the present context.

- What are the significant factors in auditing of FVMs?
- What are the inter-relationships among aforesaid identified factors?
- How do these factors influence the decision making process of auditor's in thee fair value audit process.
- What can be the strategies to assist the auditors' in FVM audit decision making?
- What is the level of awareness among Indian auditors' on FVM auditing?

Summary

Chapter two discuss the literature review on FVM auditing and describe how this research fits well with existing literature and highlights specific gaps that have been addressed. Comprehensively, this chapter details the literature reviewed to set the foundation for the proposed decision making framework and relevant analysis discussed in later chapters. Further, this Chapter provides details of the literature review in terms of classification, country, and type of journals, focus area and research methodology on FVM auditing. The next Chapter presents the methodology to address these key gaps and drawing of research objectives.

Table 2.1: Description of studies based on their themes

Theme	Description
Auditing Challenges and issue in FVM Audit	Barth *et al.* (1995) identify the major challenges for auditors in in fair value environment. Kohlbeck *et al.* (2009) use roman pizza example to demonstrate the FVM auditing process. Griffith *et al.* (2014) focuses on complexity and subjectivity among auditing standards and assumptions. Glover *et al.* (2014) focuses on the rationality of managerial assumption and verifiability of managerial evidence. Cannon and Bedard (2014) Highlighted the major issues in the FVM audit process. Jeremy B. Griffins (2011) examine the role of additional disclosures indecision in FVM Audit Process. Martin *et al.* (2006) explains the audit difficulties with reference to the psychology and auditor's decision-making process. Singh and Doliya (2015) highlight the potential challenges in FVM audit process. Lacroix *et al.* (2011) studied the jurisdictional and behavioral dimension of fair value audit. Griffith *et al.* (2014) explains the importance of critical thinking in fair value audit and its usefulness against auditing issues and challenges. Bell and Griffin (2012) discussed the rational of fair value calculation and presents accountability framework They suggested some changes regarding audit report. Glover *et al.* (2014) studied the gap between auditor's performance and PCAOB unreasonable expectations. Bratten *et al.* (2013) discussed the fair value audit process with Bonner (2008) three judgment factors. Lee and Park (2013) examine OCI (Other comprehensive income) in relations to fair value audit.

	Christensen et al (2012) studied the impact of the convergence process on the fair value audit issue and challenges. Macve (2015) use historical background of fair value auditing to discuss the fair Value vs Conservatism debate. Kumarasiri and Fisher (2011) studied the auditing issue from the Sri lanakn Auditors perspective Doliya and Singh (2016) use ISM for study the interrelation between FVM audit factors for holistic assessment. Austin *et al.* (2016) study the cause for auditor's dismissive behavior in FVM auditing. Emett *et al.* (2016) study PCAOB guideline for FVM auditing and find that contemporary regulation open a window of opportunity for managerial adjustment. Abdullatif (2016) use example of Jordan to summarize the FVM auditing challenges for auditors in developing economies.
Professional skepticism	Jason Tyler Rasso (2014) studied professional skepticism by using two construal level theories and found the positive and negative correlation with high and low level of construal. Backof *et al.* (2014) highlight the auditor's failure in professional skepticism and test the impact of intervention on auditor's judgment process. Glover and Prawitt (2014) studied professional skepticism at different level and propose a skepticism continuum for proper use of skepticism at different situations. Nolder and Kadous (2014) studied skepticism as fundamental of audit process and provide attitude based definition of skepticism for further JDM testing. Hurtt *et al.* (2013) synthesis all relevant research on professional skepticism. Mark W. Nelson (2009) summaries all research related to professional skepticism auditing. Kadous and Yuepin (2016) suggest intrinsic motivation as a tool to improve the quality of judgement in complex FVM auditing.

	Lherm (2016) find that auditors tendency for using evidence to assure the FVM estimation is primary reason for auditors failure in application of skepticism
Valuation Specialist:-	Carpentier *et al.* (2008) done a study on valuation specialist role in FVM audit and raise question on his ability to provide realistic FVM valuation. Joe *et al.* (2014) done a studied the impact of third party specialist on auditors decision making progress. Glover *et al.* (2014) differentiate between In house valuation specialist and third party valuation specialist and found that most of auditors use different pricing services then management.* Griffith *et al.* (2014) discovers the optimum condition for enhancing the Valuation specialist positive influence auditor's performance* Brown-Librd et al (2014) studied the effect of valuation specialist on internal control effectiveness. Boritz *et al.* (2014) study the valuation specialist job from manager and auditor's perceptive. Bring and Tang (2016) fins the impact of mediating role of social pressure between external consultant on auditors fair value decision making
Fair Value Audit Fees	Goncharov *et al.* (2012) probes the attributes of audit fees in two different views (Fair value and depreciated coast). Mohrmann *et al.* (2013) has studied the market perception of the fair value assets and audit fees. Michael et al. (2014) explores the association of audit fees with the fair valued assets at different levels of inputs proportionally held by the banks. Mohrmann *et. al.* (2014) links the abnormal audit fees and audit firm size with the fair value disclosures and market valuation.

	Ghosh *et al.* (2016) use goodwill and impairment charges to illustrate the positive association between fair value auditing and audit fee. Mark Kohlbeck *et al.* (2016) auditors' role in input classification of FVM hierarchy especially for level 3 to alter the audit fee. Cameran and Perotti (2014) use Italian banking firm data to illustrate the relationship between auditor's fee and FVM auditing. Alexeyeva and Likosova (2015) use sample of 24 European countries to show the positive association between audit fee and fair value.
Presentation & Format	Clor-proell *et al.* (2014) to find the impact of change in presentation format on user's fair value measurement understanding. Backof *et al.* (2014) studied the effect of presentation format on auditor's skepticism and found that management provided evidence highly affect auditor's skepticism. Maksymov *et al.* (2012) tested the impact of the frame of question (positive or negative) on the audit procedures. Cohena *et al.* (2016) find that framing of question (positive or negative) has a strong impact on auditor's fair value estimation and suggest balanced framing for lower valuation. Dennis *et al.* (2016) find the association between visual cues in report and nonprofessional investor's judgment.

Table 2.2: Classification of studies

S. No	Title of Study	Authors	Country	Year	Sources	Finding	Method	Focus Area
1	Audits of Complex Estimates as Verification of Management Numbers: How Institutional Pressures Shape Practice	Griffith, E. E., Hammersley, J. S., & Kadous, K	USA	2015	Contemporary Accounting Research,	Two main cause for auditing issue in FVM: 1- Failure to maintain the consistency in FVM estimation 2-No adjustment in estimation model	Theory Based analysis	FVM audit practice & Challenges/ Valuation Specialist
2	Challenges in Auditing Fair Value Measurements and Other Complex Estimates: Insights from Audit Partners	Steven M. Glover Mark H. Taylor Yi-g Wu	USA	2014	SSRN	Study focused on FVM auditing challenges and provides evidence regarding key factor that influence choice of Valuation Specialist or an in house valuation specialist.	Descriptive statistics	FVM audit practice & Challenges/ Valuation Specialist
3	Auditors' Perceptions of Fair-Value Accounting: Developing Country Evidence	Jayanthi Kumarasiri& Richard Fisher	AUS	2011	International Journal of Auditing	This paper study auditor's perception of developing country towards fair value and summarize the challenges of FVM auditing in Sri Lankan market.	Descriptive Statistics	FVM audit practice & Challenges
4	Auditing Challenging Fair Value Measurements: Evidence from the Field	Nate Cannon, Jean C. Bedard	USA	2014	SSRN	Study found estimation uncertainty is big challenges for auditors and advocate for clear regulation to connect estimation uncertainty and risk assessment	Experiment	FVM audit practice & Challenges
5	The Effect of Uncertainty and Disclosure on Auditors' Fair Value Materiality Decisions	Jeremy B. Griffin	USA	2014	Journal of Accounting Research	Study found that when impression and subjectivity are high in fair value auditor choose adjustment in fair value	Experiment	FVM Audit Practice & Challenges
6	Auditing Fair Value Measurements: A Synthesis of Relevant Research	Roger D. Martin, Jay S. Rich, and T. Jeffrey Wilks	USA	2006	Accounting Horizons	This paper focuses on auditor's judgment & decisions making process, while	Conceptual paper	FVM audit practice & Challenges

						highlighting the several probable biasness and limitation of FVM audit		
7	The erosion of jurisdiction: Auditing in a market value accounting regime	Smith-Lacroix, J. H., Durocher, S., & Gendron, Y.	Canada	2012	Critical Perspectives on Accounting	This paper highlighted the behavioral and Judicial consequence of normative shift toward FVA from HCA	Conceptual Paper	FVM audit practice & Challenges
8	Improving Auditors Consideration of Evidence Contradicting Management's Assumptions	Ashley a. Austin, Jacqueline s. Hammersley, Michael a. Ricci	USA	2016	SSRN	This Study find that inconsistency of available evidence against auditor's preferred conclusion result in auditors' dismissiveness of available of evidence.	Experiment Research	FVM audit practice & Challenges
9	Auditor Mindsets and Audits of Complex Estimates	Emily E. Griffith Jacqueline S. Hammersley Kathryn Kadous Donald Young	USA	2015	Journal of Accounting Research	This study advocates for a broader perspective on audit information and found deliberative mindset intervention at different level can help auditors in enhancement of audit quality.	Experiment	FVM audit practice & Challenges
10	Commentary on Auditing High-Uncertainty Fair Value Estimates	Timothy B. Bell and Jeremy B. Griffin	USA	2012	Auditing: A Journal of Practice & Theory	This paper synthesis the fair value measurement issues reported by auditors and standards.	Conceptual Paper	FVM audit practice & Challenges
11	Mind the Gap: Why do Experts Disagree on the Sufficiency of Audit Evidence Supporting Complex Fair Value Measurements?	Glover, S. M., Taylor, M. H. Wu, Y. J.	USA	2015	SSRN	They found that current regulatory environment and estimation uncertainty widens the expectation gap between PCAOB and auditors performance and changes are required in specific guideline for auditing procedures, evidence and documentation	Descriptive statistics	FVM audit practice & Challenges

12	The Audit of Fair Values and Other Estimates: The Effects of Underlying Environmental, Task, and Auditor-Specific Factors	Brian Bratten,Lisa Milici Gaynor,Linda McDaniel,Norma R. Montague	USA	2013	Auditing: A Journal of Practice & Theory	This study suggests specific, empirical research lines of inquiry focused on understanding the possible underlying sources of PCAOB-observed audit deficiencies.	Conceptual Paper	FVM Audit Practice
13	Extreme Estimation Uncertainty in Fair Value Estimates-Implications for Audit Assurance	Brant E. Christensen, Steven M. Glover, and David A. Wood	USA	2012	Auditing: A Journal of Practice & Theory,	This study question the auditor's ability to provide a high level of positive assurance .They also found out that a small change in unobservable input leads to huge change in valuation figure.	Conceptual Paper	FVM Audit Practice
14	Improving Auditors Consideration of Evidence Contradicting Management's Assumptions	Ashley a. Austin, Jacqueline s. Hammersley, Michael a. Ricci	USA	2016	SSRN	This Study find that inconsistency of available evidence against auditor's preferred conclusion result in auditors' dismissiveness of available of evidence.	Experiment Research	FVM audit practice & Challenges
15	Auditors and net transfers of Level 3 fair-valued financial instruments	Mark Kohlbeck; Thomas Smith; Adrian Valencia	USA	2016	Advances in Accounting	This study use public bank data to show that auditor tend to mitigate the risk of level 3 classification through restricting transfer to level 3 and charging higher audit fee.	Descriptive statistics	Audit fee/ FVM audit practice & Challenges
16	PCAOB Guidance and Audits of Fair Values for Level 2 Investments	Scott A. Emett Robert Libby Mark W. Nelson	USA	2016	SSRN	This study find that 'client preference and limitation of auditing regulation affect the auditor's adjustment decision for level 2 of FVM hierarchy.	Experiment Research	FVM audit practice & Challenges

17	Auditing Fair Value Estimates in Developing Countries: The Case of Jordan.	Modar Abdullatif	Jordan	2016	Asian Journal of Business and Accounting	This study discuss the unrealistic challenges of auditing fair value in developing economies context.	Conceptual	FVM audit practice & Challenges
18	Fundamental issues related to using fair value accounting for financial reporting	Barth, Mary E; Landsman, Wayne R	USA	1995	Accounting Horizons	This study highlight the auditing challenges in treatment of fair value in financial reporting.	Conceptual	FVM audit practice & Challenges
19	Fair Value vs Conservatism? Aspects of the History of Accounting, Auditing, Business and Finance from Ancient Mesopotamia to Modern China	R.H. Macve	U.K	2015	British Accounting Review	This study help in understanding the historical genesis of modern financial accounting theory	Conceptual	FVM audit practice & Challenges
20	An ISM Approach to analyze the interaction between factors of FVM audit process	Prince Doliya, and Jatinder P. Singh	India	2016	Journal of Emerging Technologies in Accounting	This Study attempt to understand the various interrelationship between factors of FVM audit process and their affect the auditor's decision making.	Experiment Research	FVM audit practice & Challenges
21	On the audit of fair value measurement	JP Singh & Prince Doliya	India	2015	Ekonomski horizonti,	This study highlight the challenges and issue in FVM audit process.	Conceptual	FVM audit practice & Challenges
22	Auditing intangible assets and evaluating fair market value – the case of reacquired franchise rights	Mark J. Kohlbeck, Jeffrey R. Cohen, and Lori L. Holder-Webb	USA	2009	Issues In Accounting Education	Auditing fair market value illustrated through Roman Holiday Pizza Paradise corporation.	Conceptual	FVM audit practice & Challenges
23	Fair value accounting: Affect on The Auditing Profession	Danny Pannese & Alan DelFavero	USA	2010	The Journal of Applied Business Research	This Study summarizes the FVM auditing challenges faced by auditors.	Conceptual Paper	FVM Audit Practice

24	Subjectivity in fair-value estimates, audit quality, and informativeness of other comprehensive income	Cheol Lee, Myung S. Park	USA	2013	Advances in Accounting	This study found that subjective assumption and judgment lead to different valuation effect between Big 4 and No-Big 4 audit firm	Descriptive statistics	FVM Audit practice
25	Construal instructions and professional skepticism in evaluating complex estimates	Jason Tyler Rasso	USA	2015	Accounting, Organizations & Society	Study found that high level of construal can enhance the professional skepticism and task complexity has positive relationship with skepticism	Descriptive statistics	Professional Skepticism
26	The effect of an Audit Judgment Rule on audit committee members 'professional skepticism: The case of accounting estimates	YoonJuKanga, AndrewJ.Trotmanb,KenT.Trotmanc,*	USA	2015	Accounting, Organizations and Society	This Study found that there is no direct relationship between alternative judgment framework and skepticism.	Experiment	Professional Skepticism
27	Research on Auditor Professional Skepticism: Literature Synthesis and Opportunities for Future Research	R. Kathy Hurtt, Helen Brown-Liburd,Christine E. Earley, Ganesh Krishnamoorthy	USA	2013	Auditing: A Journal of Practice & Theory	A research synthesis current literature on skepticism and suggest future research direction.	Conceptual Paper	Professional Skepticism
28	A Model and Literature Review of Professional Skepticism in Auditing	Mark W. Nelson	USA	2009	Auditing: A journal of Practice &Theory	Paper synthesis research related to professional skepticism in auditing.	Conceptual	Professional Skepticism
29	Enhancing Auditor Professional Skepticism: The Professional Skepticism Continuum	Steven M. Glover Douglas F. Prawitt	USA	2014	Current Issues in Auditing	This study found that if regulation and/or inspection focus is not properly aligned with relevant audit risks regulation can threaten the appropriate application of auditor skepticism	Conceptual Paper	Professional Skepticism

30	The Way Forward on Professional Skepticism: Conceptualizing Professional Skepticism as an Attitude.	Nolder, C. J., & Kadous, K.	USA	2014	SSRN	This study developed attitude definition of skepticism and use in JDM framework to highlight root causes of audit deficiencies and facilitate the development of interventions to correct it.	Conceptual paper	Professional Skepticism
31	How Does Intrinsic Motivation Improve Auditor Skepticism in Complex Audit Tasks?	Kathryn Kadous; Yuepin (Daniel) Zhou	USA	2016	SSRN	This study find that Intrinsic motivation can improve specific information processing, which leads to increase in auditor's skepticism level in complex audit process.	Experiment Research	Professional Skepticism
32	The Jurisdiction of Comfort: Auditing Beyond Auditability. An Investigation into the Use of Professional Skepticism in the Audit of Estimates	François René Lherm	France	2016	SSRN	This article claims that auditor's failure in application of skepticism is caused by auditor's effort towards "assuring the estimates based on evidence" instead of sufficient "appropriate evidence to assess estimates reasonableness"	Descriptive statistics	Professional Skepticism
33	Does fair value measurement provide satisfactory evidence for audit? The case of high tech valuation	Carpentier, C., Labelle, R., Laurent, B., & Suret, J. M.	Canada	2008	SSRN	This study found inconsistency in valuation specialist result for same condition because of different assumption and different valuation model.	Conceptual Paper	Valuation Specialist
34	Use of Valuation Specalists' Reports When Auditing Fair Value Measurements: Do Auditors Stay in their Comfort Zone?	Jennifer R. Joe S.D. Vandervelde Yi-Jing Wu	USA	2015	SSRN	Study found that when client risk is high quantification level in specialist report highly influenced to auditor's work	Descriptive statics	Valuation Specialist
35	The Effect of Reliance on Third-Party Specialists under Varying Levels of Internal Control Effectiveness on the	Brown-Liburd, h. l., Mason, s. a., & Shelton, S. w.	**USA**	2014	Working paper	Authors found that manager give more weightage to valuation specialist then their own experience. They also found that third part specialist presence or absence affects	Experiment	Valuation Specialist

	Audit of Fair Value Measurements					the risk associated with the accounting estimate process.		
36	The Impact of Estimate Source and Social Pressure on Auditors' Fair Value Estimate Choices	Alisa G. Brink Fengchun Tang	USA	2016	Behavioral research in accounting	This paper investigate the impact of interaction between estimate source and social pressure on auditor's fair value estimation process.	Experiment Research	Valuation specialist/ FVM audit practice & Challenges
37	Auditors' and Specialists' Views About the Use of Specialists During an Audit	J. Efrim Boritz, Linda A. Robinson, Christopher Wong and Natalia Kochetova-Kozloski	Canada	2014	SSRN	This paper attempt to study the manager and auditor's perception towards specialist job. Further they highlight the status quo of specialist in complex auditing environment	Experiment Research	Valuation Specialist
38	Fair Value and Audit Fees	Igor Goncharov, Edward J. Riedl, Thorsten Sellhorn	USA	2014	Review of Accounting Studies	This study found that reporting property assets at fair value results in lower audit fees and impairment of assets is a major reason for enhancement of audit fees	Descriptive statistics	Audit Fees
39	Fair Value Measurements and Audit Fees: Evidence from the Banking Industry	Michael L. Ettredge, Yang Xu Han S. Yi	USA	2014	Auditing: A Journal of Practice & Theory	They found evidence that audit fess varied with fair value input hierarchy, Level 3 input fair value are more positivity associated with audit fees than level 1 and 2 input	Descriptive statistics	Audit Fess
40	Fair value accounting for non-current assets and audit fees: Evidence from Australian companies	Dai Fei (Troy) Yao, Majella Percy, , Fang Hu	Australia	2015	Journal of Contemporary Accounting & Economics	Study found evidence on positive association between fair value of noncurrent assets and audit fees.	Descriptive statistics	Audit fee
41	Are Extensive Audits "Good News"?Market Perceptions of Abnormal Audit Fees and Fair Value Disclosures	Ulf Mohrmann, Jan Riepe Ulrike Stefani	Germany	2015	SSRN	They found that audit fees increase when fair value assets are higher in total assets and abnormal or additional audit fess is not an indication of more reliable audit fees, rather than its an indication of additional risk.	Descriptive statistics	Audit Fees

42	Audit Quality of Complex Accounting Estimates: Evidence from Audit Tests of Goodwill and Special Charges.	Aloke (Al) Ghosh; Cunyu Xing; Jun Wang	USA	2016	SSRN	Study use impairment of goodwill to demonstrate the positive association between audit fee and fair value	Descriptive statistics	Audit fee/ Presentation & format
43	Audit Fees and IAS/IFRS Adoption: Evidence from the Banking Industry	MaraCameran; Pietro Perotti	Italy*	2014	International Journal of Auditing	Using a sample of Italian banks from 1999 to 2006, this study found that fair value oriented standards need greater effort from auditors ,which likely to be reflected by higher fees	Descriptive statistics	Audit Fee
44	The Impact of Fair Value Measurement on Audit Fees: Evidence from Financial Institutions in 24 European Countries	Irina Alexeyeva, Margarita Mejia-Likosova	Sweden	2015	International Journal of Auditing	This study uses sample of 177 banks from 24 European countries to show positive association between fair value measurement and audit fees. Further this study also find that strong institutional framework has positive relation with effort spent on evaluation of higher uncertainty fair value inputs.	Descriptive statistics	Audit Fee
45	The Effects of Presentation Salience and Measurement Subjectivity on Nonprofessional Investors' Fair Value Judgments	Shana M. Clor-Proell1, Chad A. Proell1 andTerry D. Warfield2	USA	2014	Contemporary Accounting Research	This study found that high level of salience is more positively correlated with FVM instead of lower level.	Experiment	Presentation &Format
46	Auditing Complex Estimates: Management-Provided Evidence and Auditors' Consideration of Inconsistent Evidence	Ann G. Backof,Jane Thayer,Tina D. Carpenter	USA	2014	SSRN	Study found that simple intervention and graphic evidence result in higher skepticism and auditor is less skeptical When audit evidence is provides in text format rather than graphics.	Descriptive statistics	Presentation &Format/skepticism
47	Effects of Procedure Frame, Procedure Verifiability, and Audit Efficiency Pressure on Planning Audits of Fair Values	Eldar Maksymov Mark W. Nelson William R. Kinney	USA	2012	SSRN	Study found that frames and efficiency pressure affects panning of audit judgment and auditors has no idea that his decisions getting influenced by framing	Experiment	Presentation &Format

48	The Effect of Framing on Information Search and Information Evaluation in Auditors' Fair Value Judgments	JeffreyCohena Lisa M. Gaynorb Norma R. Montaguec Julie H. Waynec	USA	2016	SSRN	Positive and negative farming of question has a significant effect on auditor's information evaluation process. This also leads to lower fair value estimated by increasing the risk of material misstatement.	Experiment Research	Presentation &Format/ Skepticism
49	The value relevance of managers' and auditors' disclosures about material measurement uncertainty	Sean A. Dennis; Jeremy B. Griffin; Karla M. Johnstone	USA	2016	SSRN	Study examine the value relevance of auditor disclosures on fair value estimations for material misstatement and how visual cues in disclosures affect nonprofessional investor's judgment.	Experiment Research	Presentation & format
50	Discussion of construal instructions and professional skepticism in evaluating complex estimates	Michele L. Frank; B. Hoffman.	USA	2015	Accounting, Organizations and Society	Study discuss the Rasso (2014) finding and highlight the practical challenges in implementation of JDM approach.	Conceptual	Presentation &Format/ Skepticism

CHAPTER 3

RESEARCH DESIGN

Preview

This Chapter presents the research approach and methodology of the study. A self-explanatory questionnaire was designed for identifying the most significant factors in FVM auditing in process. Further, chapter discuss the questionnaire purification process and assess the reliability and validity of designed instrument. The objective responses were analyzed through different data analysis techniques (EFA, AHP and ISM), which briefly discussed at the end of chapter.

CHAPTER 3 RESEARCH DESIGN

3.1 Introduction

The establishment of research framework is the most important phenomenon to determine the objectives of the study. The objective of the present study is to perform a comprehensive evaluation of FVM audit process and identify the factors, which directly or indirectly affects auditor's decision making process in FVM auditing. The other objective of the study is to establish the inter-relationship among the pre-defined factors.

This chapter includes a detailed description of research methodology adopted for achieving above discussed objectives. First, we identify various factors of FVM audit decision making process from various stakeholder's (including Big 4 auditors, Non Big 4 auditors, Manager, Academia and Regulators) perspective using Exploratory Factor Analysis (EFA). Afterwards, the study prioritizes and ranks the pre-defined factors of auditors' FVM audit decision-making process with the help of Analytical Hierarchical Process (AHP). In the third Stage, Interpretative Structure modeling (ISM) is used for studying and establishing the inter-relationship among factors of FVM audit process. Considering this, the study requires a different sample/data, methodology, sources of data, questionnaires development process and tools and techniques with respect to each stage. Henceforth, the detailed research design within which the research is conducted is specified in this chapter.

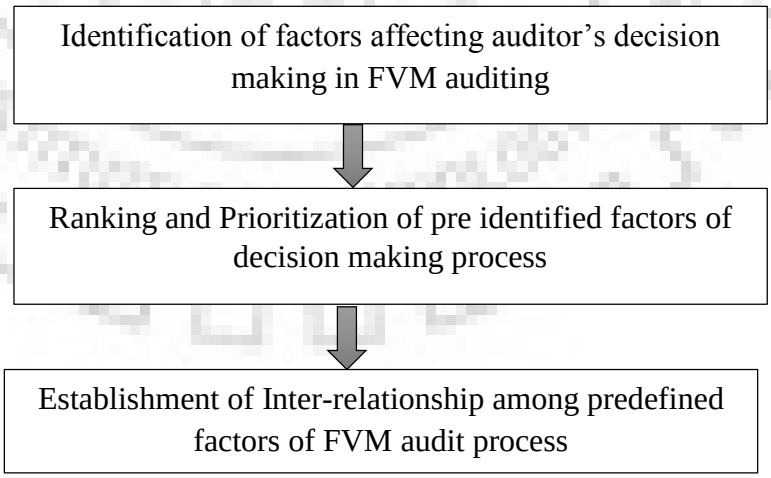

Figure 3.1: Research design of the study

3.2. Justification of research methodology

In this study, combination of survey research and modeling techniques are used to study the FVM audit process from practitioners and researchers' perspectives. Survey research uses a structured questionnaire to gather information from a sample of respondents (Fowler Jr, 2013). Various auditing sub fields such as internal auditing, external auditing and formation of audit committee have been studied extensively through survey method, but survey research is still not much used in FVM auditing. Henceforth, we tried to fulfill this gap and explored the survey research for achieving the objective of the present study.

Research has been categorized as quantitative and qualitative methods; quantitative methods provide a tangible and objective analysis to draw inference about the population from the sample and qualitative methods provide a full perspective that involves subjective assessment of attitudes, opinion and behavior of the researcher's understanding (Batra, 2005; Kothari, 2007). Since FVM auditing is a relatively less researched area, an exploratory and explanatory research methods have been adopted for this study. Thus, this research used an appropriate combination of various quantitative and qualitative tools viz. a) Reliability assessment b) EFA, c) AHP, and d) ISM analysis.

Firstly, we have used Exploratory Factor Analysis (EFA) to identify the factors of FVM audit from various perspectives. The significance of exploratory research increases when the literature lacks theoretical models on issues being researched (Nix, 2001; Seth *et al.*, 2006; Choubey *et al.*, 2013) and also when the literature does not fully explain the contours of the problem being examined (Forza, 2002). Secondly, Analytical Hierarchical Process (AHP) was performed to rank and prioritize the pre-identified factors; and lastly, with the help of Interpretive Structural Modeling (ISM) approach, inter-relationship among the variables was established to understand the FVM audit process comprehensively.

Hence, the application of survey method and modeling technique is justified in our research. The questionnaire survey for the empirical research was selected as the basic instruments of research. Further, AHP & ISM based modeling research is used to evaluate supply chain risk and security in Indian environment. The individual justification for AHP, ISM is covered along with the respective review on these tools and techniques in Chapter 5 and 6 respectively.

3.3 Research Objectives

The literature review helped in clearly identifying the gaps from the literature and framing of Objectives. Based on key insights of literature following objectives are framed.

1. To identify the relevant factors in contemporary fair value auditing.
2. To prioritize the factors identified above on a scientific basis for an efficient auditing exercise in fair value environment.
3. To establish various interrelationship between the factors identified above on a scientific basics
4. To facilitate a scientific and holistic presentation of fair value auditing attribute for auditors engaged in fair value auditing for auditors as well as for standards setters and regulators.

3.4 Research Methodology Design

As discussed earlier, this study follows combination of empirical and modeling technique of MCDM to achieve above objectives of this study and follow the Churchill (1979), Parasuraman et al., 1988, Gerbing and Anderson (1988) and O'Leary-Kelly and Vokurka (1998) guidelines for overall research methodology design. Figure 3.2 shows schematically representation of adopted methodology.

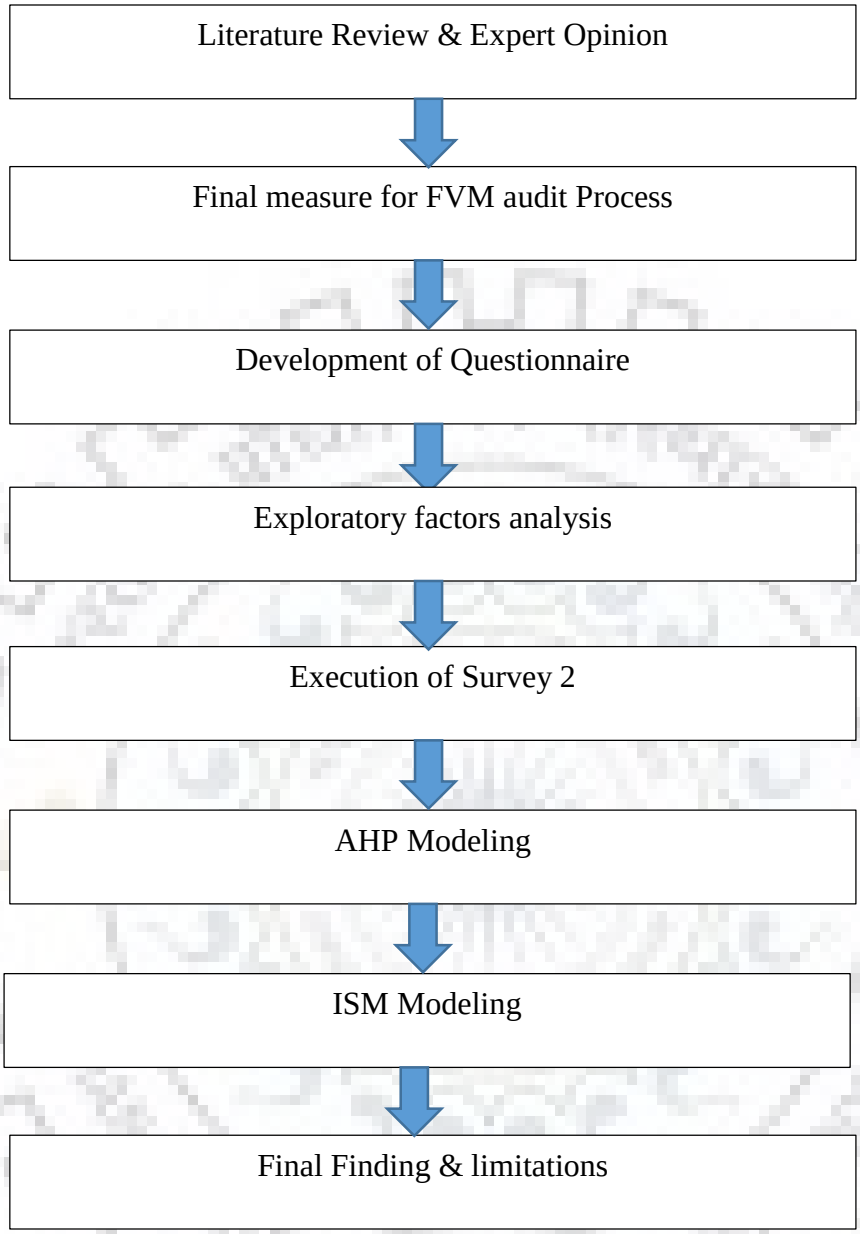

Figure 3.2- Adopted Research Methodology

3.5 Sampling frame of the study

To accomplish the objectives of the study, this stage explores the factors affecting FVM audit process. To do this, we have used different perspectives from the target group including Big 4, Non-Big 4, academia and regulators.

3.5.1 Target population of the study

As this study includes diverse group of respondents, these respondents are Big 4, Non Big 4, BSE 500, academicians and regulators. Big 4 and Non-Big 4 auditors were considered as the key informants due to the fact that they are very well aware about the IFRS and GAAP standards and differences arise due to the adoption of IFRS. BSE 500 company managers and CEOs were also considered as the key respondents. Additionally, independent Chartered Accountants' perspective was also considered as they are aware about the FVM audit process as per IFRS standards. Academicians from premiere institutes were also considered as part of this research as they help us to formulate the theoretical foundation. Regulators including the Ministry of Corporate Affairs (MCA), Institute of Chartered Accountants of India (ICAI), Institute of Company Secretaries of India (ICSI), Reserve Bank of India (RBI), Securities Exchange Board of India (SEBI) and senior officials were consider as the perspective respondents.

3.5.2 Sampling Method

Convenient sampling method was opted to collect the data for this study. The convenience sampling, a non-probability sampling technique was utilized to draw the representative data due to their effortless and speedy way to select the respondents depending upon their availability (Chein, 1981). In quantitative and exploratory research, convenience sampling method is the most common and suitable sampling method to get the approximation of the truth (Passmore and Baker, 2005). Thus, convenient sampling method was considered more suitable to get a gross estimate of the results.

3.5.3 Sample Size

A small fraction of population is known as sample size, which reflects the characteristics of the population and considered a vital element to reduce the sampling error. Roscoe (1975) provides the "rule of thumb" for determining sample size; as it is declared that sample size larger than 30 and smaller than 500 are appropriate for most of the studies. Whereas, some statistical experts suggest a data range between 5-10 times the number of items used in the scale (Hair, Black, Babin and Anderson, 2010).

For the present study, we distributed 370 questionnaires to prospective respondents including 74 Big4 auditors, 86 Non-Big4 auditors, 76 Regulators, 64 managers and 70 in academia. A majority of questioners distributed directly to prospective respondent through personal email.

In total, 250 questioners received including 57 from Big4 auditors, 57 from Non-Big 4 auditors, 37 from regulators, 49 from managers and 50 received from academia. Total responses were received with 67.56 response rate out of which highest response rate came from Big4 auditors (77.02%) and lowest was from regulators (46.57). The Mean experience of total respondent was 6.59 years that include 6.44 years from Big 4 auditors, 5.35 from Non-Big4, 10.12 years from regulators, 7.38 years from Managers and 3.67 years from academia. For the information, related to minimum and maximum experience refers to Table 3.1. Further, other measures of sampling adequacy were also check and discussed later.

Indicators	**Sub Sample**					
	Total	**Big 4 Auditors**	**Non-Big4 Auditors**	**Regulators**	**Manager**	**Academia**
Total Number of Questionnaires Distributed	370	74	86	76	64	70
Total Number of Completely filled Questionnaires	250	57	57	37	49	50
Response Rate	67.56	77.02	66.27	48.68	76.56	71.42
Mean Experience (In Yrs)	6.59	6.44	5.35	10.12	7.38	3.67
Minimum experience (In Yrs)	2	2	2.3	10	4	3
Maximum Experience (In Yrs)	28	23	13	18	25	28

Table 3.1: Description of Respondent

There are many issues and constraints while collecting the data from a relatively large number of respondents; especially to persuade them to spare their valuable time and provide useful insights aligning with the objectives of the study. Moreover, the respondents must hold high positions in the regulatory institutions, companies, and other agencies, and should attain a relevant experience in the domain as per the requirement of the present study. Therefore, the sample has been confined to limited and feasible size (i.e. respondents) in view of the constraints such as their busy schedule and accessibility

3.6 Questionnaire development of the study

Questionnaire development is considered as one of the most important stages of the study. For the present study, a two-part questionnaire was designed after careful consideration that includes both open ended and close ended questions. Keeping the research objectives in mind, all questions formulated by using existing academic literature, FASB drafts and PCAOB inspection reports.

All close-ended questions were designed on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Likert scale is a widely used rating scale that requires the respondents to indicate a degree of agreement or disagreement with each statement (Albaum, 1997). A questionnaire based on Likert scale is easy to construct and easily understandable by the respondents (Malhotra, 2006). Expert committee was designed with people from industry and academia for removing the face validity among questions (Bryman & Bell, 2007). After the recommendation of review committee, appropriate changes were made in questions before final distributions.

For this study, we focus on the development of multiple measures each of which considers multiple items. To do so, we have used the seven-step process for questionnaire development and analysis suggested by Churchill (1979) and Hinkin (1995).). As such, this study will include the multi-item, multi-subscale development along with some economic and regulatory factors suggested by Jeng and Wells (2000) and Bruton and Ahlstrom (2003). Further, pre-testing and pilot study were conducted to determine the reliability and validity of the measures used in the study. For developing a comprehensive questionnaire, researcher has considered both exploratory (qualitative) and descriptive (quantitative) studies, followed by a widely accepted questionnaire development process recommended by Churchill (1979) and Hinkin (1995). The steps involved in the construction and development of questionnaires are discussed in next section and depicted in figure 3.3.

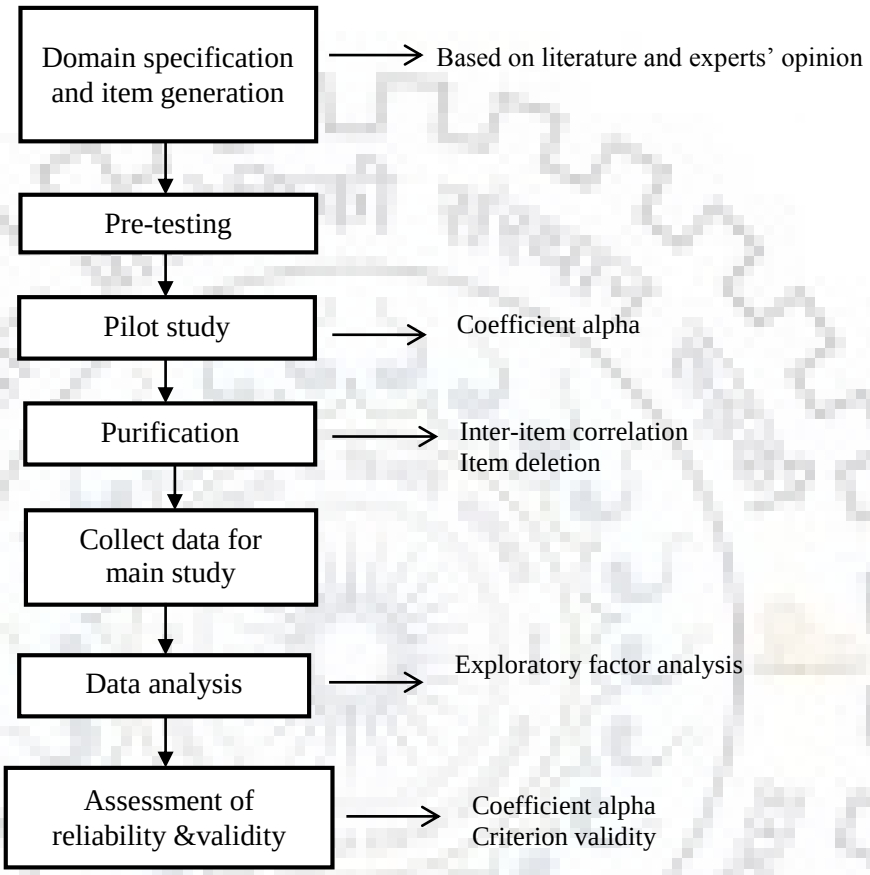

Figure 3.3: Questionnaire development process

3.6.1 Domain specification and item generation

The foremost step of the questionnaire development process is to conceptualize the key of interest. In this study, the preliminary instrument used the measurement items which were identified and adopted from an extensive review of relevant literature and experts' opinion namely - Estimation Uncertainty, Regulators, Audit firm relationship with other firms, Presentation & Formats, FVM complexity, Standards Ambiguity, Auditing firm reputation, Managerial bias, audit fee, Cognitive limitations, Skepticism, Knowledge and Understanding and valuation specialist. Consequently, a total number of 46 items were included in the questionnaires to accomplish the research objectives of this study. Some of the measures are

self-reported while others were adapted from previous literature. The key measures and their sources are presented in Table 3.4.

Table 3. 2 Key factors and relevant literature

S. No	Key Factor	Source & Relevant Literature
1	Valuation Specialists	Glover *et al.*, 2014; Griffith *et al.*, 2014; Joe *et al.*, 2014; Carpentier *et al.*, 2008, Brown *et al.*, 2014
2	Professional Skepticism	Rasso 2015; Backof *et al.*, 2014 , Glover and Prawitt 2014 , Nolder and Kadous 2014; Kang *et al.*, 2015
3	Audit Fee	Goncharov *et al.*,2014; Mohrmanns *et al.*, 2013; Ettredge *et al.*, 2014
4	Estimation Uncertainty	Cannon and Bedard 2014; Christensen *et al.*,2012; Bratten, Gaynor *et al.*, 2013, Griffin, 2014
5	Managerial Bias	Martin and Wilks 2006; Griffith *et al.*, 2015; PCAOB Inspection Report 2011,12.13.14, Singh and Doliya, 2015
6	Regulators	Carmichael, 2004; Hughes and Tett, 2008; Glover *et al.*, 2014a; Church and Shefchik, 2011; PCAOB Inspection Reports 2011, 2012, 2013, 2014
7	Standards Ambiguity	Christensen *et al.*, 2013; Holthausen and Watts, 2001; Bratten *et al.*, 2013
8	FVM Complexity	Martin et al., 2006; Cannon and Bedard, 2014; Bratten et al., 2013
9	Auditing firms Reputations	Nagy A. L. 2014; Irani et al., 2014
10	Knowledge & Understanding	Martin et al., 2006; Lacroix et al., 2012; Kumarasiri and Fisher 2011; Bratten et al., 2013
11	Presentation & Format	Maksymov et al., 2012; Backof et al., 2014
12	Audit firm relationship with others firm	Bratten et al., 2013; Backof et al., 2014
13	Cogitative limitations	Doliya and Singh 2015; Bratten et al., 2013

All variables were measured on a five-point likert-type scale: 'To what extent you are agree with the following statement? (Ranging from 1- Strongly disagree to 5 – Strongly agree). A likert scale is a widely used rating scale that requires the respondents to indicate a degree of agreement or disagreement with each statement (Albaum, 1997). A questionnaire based on likert scale is easy to construct and easily understandable by the respondents (Malhotra, 2006).

3.6.2 Pre-testing of the survey questionnaires

After developing a rough draft of questionnaires, next step was to conduct the pre-testing of the survey questionnaires to warrant the quality, content and meaningfulness of the items generated. Pre-testing of the questionnaires was conducted to measure the instrument quality and content validity. Hair *et al*. (2010) have suggested the testing of questionnaire from academicians having good expertise; before collecting the data. In order to develop an effective and valid questionnaire, many suggestions have incorporated proposed by Dillman's (1978) Total Design Method (TDM). The primary emphasis of TDM is the writing of questionnaire in order to strengthen the validity of the questionnaire. The purpose is to determine the best questionnaire structure, which could have a positive significant effect on the respondent rate and generate valid data.

A questionnaire should not be used in the field survey without having an adequate pre-testing (Zelnio and Gagnon, 1981). Pre-testing should always be extensive, which includes questionnaire content, structure, sequence and layout, meaningfulness of the measures to improve the questionnaire (Malhotra *et al*., 1996). After developing the first draft of the questionnaires from the extensive literature survey, it was fine-tuned and reviewed by the supervisor and other faculty members to examine the meaningfulness and validity of both the questionnaires. After receiving the preliminary inputs from them, slight changes were made to sharpen the content of the questionnaires and intensify their applicability in the contemporary FVM audit environment. Subsequently, the refined questionnaires were considered to test the questionnaires in the field itself. Three industry professionals having good knowledge about the FVM audit process were requested to participate in the study. Thereafter, the initial responses were assessed and asked them to identify the complexity in the interpretation of items (Churchill, 1979). Based on their feedbacks and suggestions, few revisions were made and the questionnaire structures were modified to align the scale to current FVM audit process.

3.7 Pilot study of the survey questionnaires

After pre-testing the questionnaires, a trial or pilot study was carried out to test the feasibility, reliability and validity of the questionnaires before it is used for main study. Pilot study is necessary to conduct so as to assess the feasibility, estimating resources, estimating the treatment effects and its variances (Van Teijlingen *et al*., 2001). Pilot study justification might refer to the overall research design, validity and reliability of the questionnaire. Conducting a pilot study prior to the main study can enhance the likelihood of success of the main study and potentially helps to avoid the fated main studies. A pilot study was conducted to facilitate the clarity of the measures, determining the reliability and validity of the questionnaire, testing the effectiveness of the data collection procedure. For this purpose, two pilot studies were conducted for both the questionnaires to check the internal consistency and reliability of both the questionnaires using appropriate statistical techniques (like Descriptive statistics and Cronbach's alpha). Cronbach's alpha is widely used to indirectly indicate the degree to which a set of items measure a single unidirectional latent construct. It can be estimated using the following formula:

$$\text{Cronbach's } \alpha = \frac{K}{[K-1]}\left[1 - \frac{\sum_{i=1}^{k} P_i Q_i}{\sigma_x^2}\right] \quad \textbf{(3.1)}$$

Where, K is the number of items; $\sigma_x^2$is the variance of the observed scores; P_i is the proportion scoring 1 on item i; and Q_i is the 1- P_i.. The statistical values of cronbach's α ranges from 0 to 1; and the value being more or = 0.60 is considered acceptable (Field, 2009). The output of reliability score of each scale is presented in Chapter 5.

3.8 Questionnaires purification

The calculations to purify a questionnaire depend on the measurement model researcher trying to embrace (Churchill, 1979). The most widely and logically defensible model is the domain sampling model that states the purpose of any specific measurement is to estimate the score by using all the items in the domain (Nunnally, 1967). The domain sampling model is based on the concept of infinitely large correlation matrix representing the correlations of all the items in the specific domain. It describes that no single item can provide a perfect representation of the concept due to the certain distinctiveness of the each item. To check the internal consistency of a set of items, coefficient alpha is a recommended measure which directly based on the

assumptions of the domain sampling method. Items with nearly zero correlation and items which generate a sudden drop in the item-to-total correlation were deleted. For purification of the scale, item analysis has been performed by the researchers on both the scales as recommended by Churchill (1979). Cronbach's alpha values along with the inter-item and item-to-total correlations were analyzed to check the significance of the items. Items having the lowest values of item-to-total correlation were deleted in cases where deletion increased alpha values; in cases where deletion did not increase alpha values, items were not deleted. The items were deleted until Cronbach's alpha does not reach to its minimum acceptable value (i.e. 0.60) and alpha value started decreasing as suggested by Nunnally (1978) and Idris (2011). Closer inspection of the individual items Cronbach's alpha shows that the figure for each measure cannot be further improved by deleting any item.

3.9 Data collection procedure

To collect the various perspectives of FVM audit process, a total of 370 questionnaires were administered through mail survey and field survey to the FVM audit process firms in India during the time period from October, 2014 to February, 2015. To collect the maximum responses, first respondents were introduced about the significance of the study and to enhance the survey efficiency with minimizing possible mistakes. A cover letter was offered to respondents highlighting the significance of the study and ensuring that the collected information will be used for academic purposes and would be kept confidential. Finally, the questionnaires with the cover letter were provided to the respondents; and a total of 270 (67.56%) responses were received. The data were screened for outlier and missing data, after scrutinizing and cleaning the data, 239 questionnaires (detailed process has been discussed in chapter 4) were found to be suitable and valid for analysis.

3.10 Assessment of reliability and validity of the questionnaires

Reliability and validity of the questionnaire was analyzed for analyzing the auditors' decision-making process and obtain the meaningful results. Reliability and validity of the constructs are important to examine when the questionnaire is a likert-type because many variables are testing the concept (Hair *et al*., 2009).

3.10.1 Reliability

Before performing the validity analysis, each specified construct was checked for the statistical reliability. The reliability of the construct refers to the "extent to which it yields consistent

results when the characteristic being measured has not changed" (Ormrod and Leedy, 2005). Reliability indicates the consistency of the findings based on the data collection and analysis (Saunders *et al*., 2007). Zikmund and Babin (2010) stated that reliability is an indicator of a measure's internal consistency. *Cronbach alpha coefficient* is considered as the most appropriate method for testing the internal consistency of a scale (Hair *et al*., 1998; Pallant, 2007). The value of Cronbach's alpha ranges from 0 to 1 and 0.6 is considered as the minimum value for checking the internal reliability (Hair *et al*., 1998). Furthermore, researchers have also suggested some other methods to test the reliability such as *test-retest method* (Zikmund and Babin, 2010) and *split half method* (Zikmund, 2003). For this study, researcher used *Cronbach alpha coefficient,* the most common method for testing reliability and the values greater than or equal to 0.6 were considered a good indicator of internal consistency of the items within a construct (Fornell and Larker, 1981; Gerbing and Anderson, 1988; Hair *et al*., 1998). The results for reliability of both the scales are presented in Chapter 5.

3.10.2 Validity

After assessing the statistical reliability of the questionnaires, assessment of statistical validity of the questionnaires is the main concern. According to Ormrod and Leedy (2005) validity of the questionnaire is the "extent to which the instrument measures what it is actually intended to measure". Validity deals with the accuracy of an instrument or the test being capable of testing, what it was intended to measure (Hair *et al*., 2006). The overall types of validity for testing a questionnaire exists required different criteria namely, content validity, convergent validity and discriminant validity (Saunders *et al*., 2007; Zikmund *et al*., 2013). Henceforth, convergent and discriminant validity of the questionnaires were assessed.

3.10.3 Content validity:

Content validity, also known as face validity refers to "the subjective evaluation of how well the content of a questionnaire represents the measurement task at hand" (Malhotra and Dash, 2010). According to Zikmund *et al.* (2013), the scale indicates a good reflection if it measures what it was intended to measure. Content validity can be ensured if items underlying the constructs of an instrument are derived from extensive literature and where possible, consult with the experts (Hair *et al.,* 2010). In this study, the content validity of the survey instrument was assumed with the used of established measurement items from the prior literature, combined with additional insights provided by academicians and industry professionals.

3.10.4 Convergent Validity:

Convergent validity refers to "the extent to which the scale correlates positively with other measures of the same construct" (Malhotra and Dash, 2010). It also refers to the degree to which multiple measures of a construct are correlated (Hair *et al*., 2010). To ensure meaningful results, convergent validity was calculated through factor loading and Average Variance Extracted (AVE) and Composite Reliability (CR) following the work done by Fornell and Larker (1981) and Gerbing and Anderson (1988). It is suggested that factor loading and AVE should be greater than or equal to 0.50 so as to confirm the convergent validity (Hair *et al*., 1998). The outcomes of this study for both the measurement questionnaires are presented in Chapter 5.

The formulae applied to calculate Average Variance Extracted (AVEs) and Composite Reliability (CR) are (Fornell and Larcker, 1981):

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{\sum_{i=1}^{n} \lambda_i^2 + \sum_{i=1}^{n} Var\,(\varepsilon_i)} \quad \textbf{(3.2)}$$

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{\sum_{(i=1}^{(n} \lambda_i)^2 + \sum_{i=1}^{n} Var\,(\varepsilon_i)} \quad \textbf{(3.3)}$$

Where, λ = Standardized factor loading

Var (ε) = Error variance of a construct

If the value of AVE is more than 0.5, constructs used in the study have convergent validity.

3.10.5 Disciminant Validity:

Discriminant validity refers that the conceptually similar concepts are unique in some way (Hair *et al*., 2010). In this study, we have followed the work done by Fornell and Larcker (1981) to assess the discriminant validity which suggests that discriminant validity leads when the value of AVE of each factor or construct is greater than its squared correlation coefficient. According to Hair *et al.* (2010), Average Variance Extracted (AVE) values of construct should be greater than the Maximum Shared Variance (MSV) and Average Shared Variance (ASV) to confirm the discriminant validity of constructs. The results of the discriminant validity of all the constructs for both the measurement questionnaires are shown in Chapter 5.

3.11 Data analysis strategies

In this study, mainly two techniques have been employed in a research to ensure the objectives and incorporate the different elements of the study in a reasonable and coherent way. First, Exploratory Factor Analysis (EFA) was used to reduce the items of the questionnaires. In the next stage, Analytical Hierarchal Process (AHP) was employed to prioritize the factors affecting auditors' FVM audit decision-making process, and ensures that the research problem will be addressed effectively.

3.11.1 Exploratory Factor Analysis (EFA)

The data are analyzed by using Exploratory Factor Analysis (EFA) with IBM SPSS 20 (Statistical Package for Social Sciences) software to explore and validate the factors affecting auditors' FVM audit decision-making process. Factor analysis was used to summarize the data and making it more manageable without losing the important information and to test the theories (Johnson and Wichern, 1998; Tabachnick and Fidell, 2007; Field, 2009). The main reasons for conducting the factor analysis are as follows: to develop a questionnaire, to reduce the variables to a manageable size and to have a better understanding of variables (Bhaiyat, and Garrow, 2015; Field, 2009).

Before initiating data analysis, data was screened for missing values, outliers, sampling adequacy and multi-collinearity. Subsequently, factor analysis was performed to test the desired set of factors by using principal component analysis. Factor analysis is a class of multivariate techniques which is specifically used for computational analysis (Cooper and Schindler, 2008). These factors, also known as latent variables widely used to measure attitudes and feelings, which are hard to measure directly (Field, 2009). It is a way to explain the relationship among variables and then reduced to a smaller number using factor analysis (Coakes and Steed, 2001; Zikmund, 2003; Pallant, 2007).

In factor analysis, observed variables $v_1, v_2, \ldots v_n$ are represented as a linear combination of a small set of random variables $f_1, f_2, \ldots f_m$ ($n > m$) called factors or constructs. Like the original variables, the latent or factors vary from individual to individual; but unlike the variables, the factors cannot be measured or observed. The basic dimensionality of the system is less than n, if the original variables $v_1, v_2, \ldots v_n$ are at least moderately correlated. The goal of factor analysis is to reduce the redundancy among the variables using a smaller number of factors. Another

important point of consideration is the factors loading that depicts the correlation of the variable with the factor and makes it easier to interpret the factors (Zikmund *et al*., 2010). Factor rotation is the mathematical technique to simplify the results of factor analysis (Zikmund *et al*., 2010).

The most widely used method for factor analysis is principal component analysis (Cooper and Schindler, 2008; Kinnear and Gray, 2010) and varimax rotation is the most common method of factor rotation (Zikmund *et al*., 2010; Kinnear and Gray, 2010). Principal Component Analysis (PCA) checks the correlation of different variables to reveal the relationship among them, and then reduce the variables into a small number of factors by empirically summarizing them under common themes (Papadimitriou et al., 2014; Tabachnick and Fidell, 2007). Factor rotation is used as a method to interpret the factors by showing the variables that group together (Pallant, 2007). Before initiating the factor analysis, Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy and Bartlett's test of sphericity was performed to ensure the suitability of data for factor analysis (Pallant, 2007). Kaiser (1974) concludes that KMO values lying between 0.5 and 0.7 are treated as mediocre, values between 0.7 and 0.8 are good, and values between 0.8 and 0.9 are great for factor analysis. The numbers of factors usually retained are having the eigen value 1 or greater (Field, 2009).

For this study, researcher carried out the principal component analysis with varimax factor rotation to reduce and analyze the data collected from both the respondents. Further, the reliability and validity of the questionnaires were tested with appropriate statistical techniques. The results of the factor analysis for both the questionnaires are presented in Chapter 5.

3.11.2 Analytic Hierarchy Process (AHP)

Saaty (1980) introduced the analytical hierarchal process (AHP) method, directs how to determine the priority among a set of alternatives available based on the relative importance of various attributes in multi-criteria decision-making (MCDM) problems. MCDM techniques are an integral part of the decision theory where decision-makers consider more than one-criterion to support the decisions. AHP helps to solve the complex problems by modeling in a hierarchal structure and decomposing into various levels (Goal, level 1, level 2 and so on.). The primary advantage of AHP is that it can handle the multiple criteria including quantitative and qualitative with relative ease (Meade and Sarkis, 1998; Kahraman *et al.*, 2004).

AHP can help decision-makers to choose the best alternative or prioritize a set of criteria based on their need and objective, and understand the problem thoroughly. Over the years, AHP has

been successfully applied in diverse array of problems; for instance, Ossadnik and Lange (1999) evaluated software using AHP, David (2003) used AHP to determine the performance of management indicators, Ngai (AHP) applied to choose the website, Hsu and Hu (2008) used AHP to prioritize the GSCM approaches in electronic industry. AHP is a systematic approach, which constitutes development of hierarchy, pair-wise comparison matrix, weights of criteria and sub-criteria and evaluating the consistency in the judgments. In order to elicit the weights of the criteria, Saaty (1990) has explained the some steps as follows: The analyses and findings are discussed in Chapter 5.

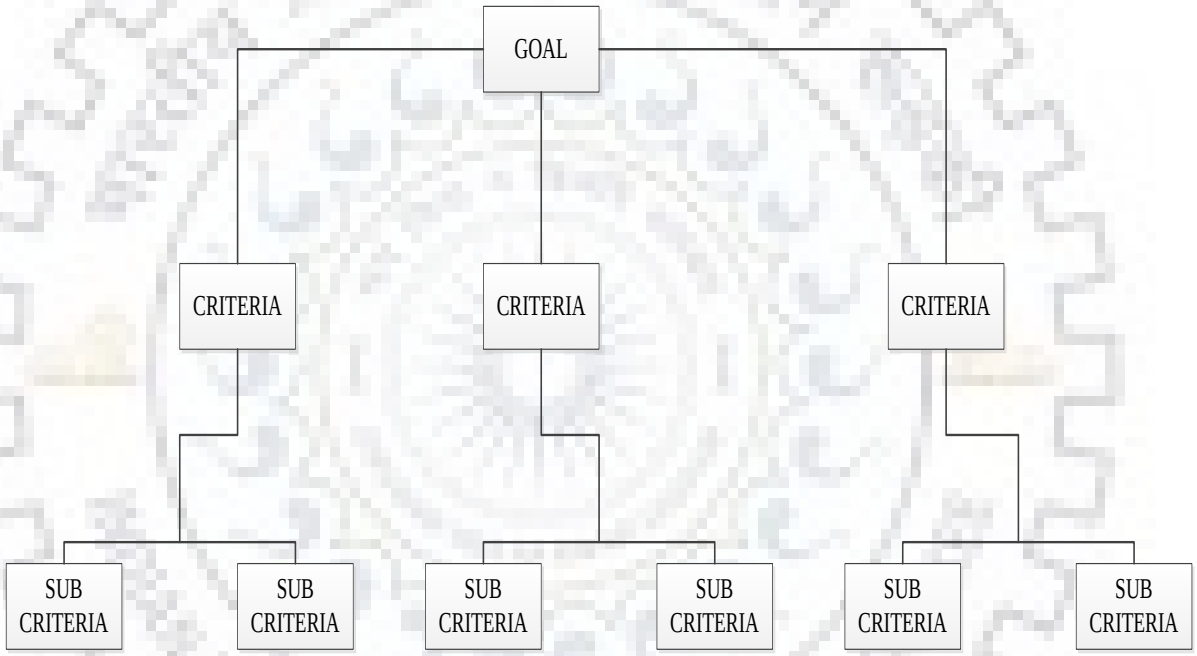

Figure 3.3: AHP Hierarchy

3.11.3 Interpretative Structure Modeling(ISM)

Interpretative structure modeling(ISM) was employed to discover the inter-relationship among the major factors of FVM audit process. ISM uses expert's opinion as a base for exhibiting the relationship among key factors. It is an interactive process that uses group judgment for extracting the structural design of factors. Firstly, it was used as "binary matrix" for the

identification of interrelationship among key factors in a complex decision process (Warfield, 1973).One of the major advantages of ISM is that it represents the structure of any complex issue with both graphics and words (Ravi & Shankar, 2005). ISM is user friendly and interpretive method which include comprehensive understanding of all associated factors and sub factors.

ISM modeling converts the object system into a well-defined and representative system consisting of directed graphs (refer to figure 3.4). An interpretation of the object system as regards content is also carried out besides the structural one, i.e. the digraphs are completed with context (information). The object system mapped as digraphs becomes the "basic structural model". The expansion with content finally leads to an "interpretive structural model". ISM is extensively accepted methodology that is used by various researchers in different industry i.e. saxena *et al*. (1992) for energy conversion in cement industry, katiyar *et al*. (2015) in Supply chain management and Sharma *et al*. (1995) for waste management. The details of data collection, along with the justification of ISM and analysis of data have been detailed in Chapter 6.

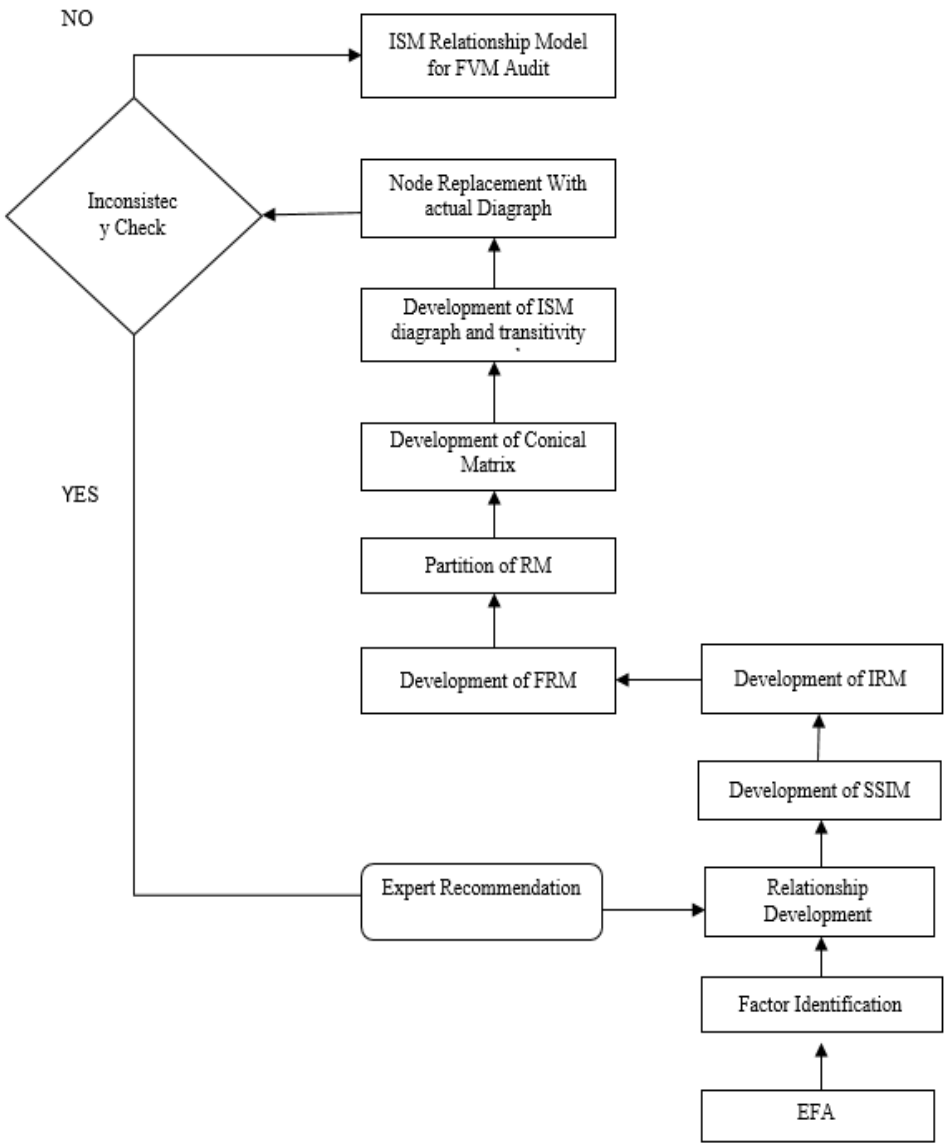

Figure 3.4: ISM Flow Diagram

3.12 Summary

In this chapter, research approach and method to fulfill research objective and questions are described in detail. Appropriate consideration for choosing the mixed method research approach is explained in detail. The chapter also presents the how the questionnaire has been

designed, purified and administered among selected respondents. The last selection of the chapter presents techniques and approaches used to analyze the questionnaire data including exploratory factor analysis, analytic hierarchy process and interpretative stricter modeling. In the next chapter, detailed analysis of results of questionnaire survey data obtained is presented

CHAPTER 4.

IDENTIFICATION OF FACTORS AFFECTING FVM AUDIT PROCESS

Preview

This chapter is empirical in nature and consists of the analysis carried out for the study. It includes Exploratory Factor Analysis (EFA) including principal component analysis (PCA) with Varimax factor rotation for identification of various FVM audit process factors based on different stakeholder response. This chapter include pilot study of pre-identified factors and factors analysis process, which resulted in thirty nine statement related to twelve key factors of FVM audit process.

CHAPTER 4
IDENTIFICATION OF FACTORS AFFECTING FVM AUDIT PROCESS

4.1 Introduction

In the chapter one, a brief overview of research design was given. In that chapter, stage one of research design begins with defining the research context – understanding the problem, defining research questions and objectives of the research. In the chapters two, a comprehensive literature review along with qualitative analysis was performed to conceptually build our research objectives. Further, chapter three present the overall research designs including relevant variables, questionnaire design and statistical and MCDM techniques used for analyzing data. The present chapter examines the data collected from the first survey. This chapter includes a comprehensive discussion on factor derivation process and various related tool and techniques. This chapter starts with the pilot study and data screening process followed by the results of Exploratory Factor Analysis (EFA).

4.2 Identification of factors affecting FVM audit process

Preliminary, 46 statements were framed from the literature review and exploratory interviews. Details of processes adopted discussed in section 3.3 and 3.4 of chapter 3. Data was collected through the questionnaire (Appendix 2). The data collection detailed in section 3.3.

4.2.1 Pilot Study of the survey questionnaire

To ensure the initial reliability and validity of the questionnaire a pilot study was conducted before commencing towards the main study. Everitt B (2006) referred pilot study as, "investigation designed to test the feasibility of methods and procedures for later use on a large scale or to search for possible effects and associations that may be worth following up in a subsequent larger study". This also ensures the integrity and reliability of data for further analysis. Pilot study help in gaining the clarity of measures, safeguarding the understanding of questionnaire by the respondents, checking the initial reliability and validity of the questionnaire. Further, a pilot study also enhances the data integrity and reliability by providing the various opportunities to refine and modify the consistent practices for the effective large scale studies

To ensure the reliability, descriptive statistics and Cronbach's alpha coefficient was tested for a set of measurement items, which assess the internal consistency of a measures or specified

construct or test items. Cronbach's alpha can be measured through correlation of score for each scale item with the total score for each observation and then comparing that to the variance for all individual item scores. Statistical experts suggested that the acceptable level of Cronbach's alpha should be greater than 0.60 to ensure the internal consistency of the measures (Nunally, 1998; Hair, Anderson, Tathum and Black, 1998; Hair, Black, Babin, Anderson and Tathum, 2006).

The pilot study was conducted during July and August, 2015 through convenient sampling method. A total of 43 survey questionnaires were administered to Delhi-NCR & Uttarakhand based respondent from the target population. A set of instructions were given to respondents to fill the questionnaire and ask for the feedbacks and comments so as to facilitate refinement of the survey questionnaire. Out of the total, 40 questionnaires were returned from respondents having mean age of 48.35 and mean experience of 5.7 years from different stakeholders. The respondents identified for the pilot study were highly experienced, mature and have the in-depth understanding of the fair value measurement. Among these 40 respondents, 17 were from Delhi, 9 from Gurgaon, 7 from Noida and 7 were from Dehradun. These respondents were selected based on two criteria: (i) Experience of the respondent in the industry, and (ii) familiarity of the respondent with the FVM auditing process. The respondents were asked to mark their responses on a 5-point likert scale for 4 items with end points strongly disagree/strongly agree. Table 4.1 shows the descriptive statistics of the pilot study. The items with a mean score of 3 or more were retained and this process resulted in the elimination of 4 items from the survey questionnaire. Thus, a comprehensive list of 42 items was obtained for further analysis

Based on respondents' feedback for pilot study, reliability of the items was checked for the internal consistency. The returned questionnaires were coded and evaluated using SPSS 20 for computing the reliability values. Cronbach's alpha values for each construct are presented in Table 4.1. Based on the SPSS results, constructs were accepted and the reliability of the questionnaire was confirmed. After this process the questionnaire put forward for further analysis.

Table 4.1: Descriptive statistics of pilot study

S. No.	Items	Mean	Std. Dev.
	Regulators		
A1	There are not adequate guidelines/standards for estimating fair values in complex situations	3.77	.817
A2	Some fundamental changes are required at regulator level for proper implementation of fair value based accounting and auditing standards	3.66	.759
A3	Focused training on FVM is required as part of professional training for an effective fair value audit	3.51	.713
A4	Regulators need to enforce strict penalty law for successful FVM implementations.	2.41	1.46
A5	Advisory facilities should be made available to the accounting and auditing fraternity by the regulators on ambiguous and equivocal issues.	3.18	.825
A6	Role of an independent supervisory outfit on the lines of PCAOB (USA) needs to be set up in India like developed economies for audit supervision.	3.82	.833
	Estimation Uncertainty		
B1	Auditors task becomes more difficult due to inherent estimation uncertainty of FVMs	3.76	.835
B2	The verifiability of FVMs is difficult due to the lack of supporting tangible evidence	3.77	.973
B3	Estimation uncertainty is one of the most important limitations to the successful adoption of fair value based accounting	4.20	.894
B4	Many developing economies does not have ample depth in their market to provide reliable FVM input..	4.03	.940
B5	Fair valuation based on subjective assumptions makes it difficult to audit	4.13	.922
	Standards Ambiguity		
C1	FVM auditing standards provide high level of opportunity for exercise of auditors' discretion.	3.97	.940
C2	Fair value measurement standards do not provide clear direction for fair value input classification.	4.06	.922
C3	Many FVM valuation and auditing standards are ambiguous in nature	3.97	.991
C4	Some standards are necessary ambiguous because of the intrinsic nature of underlying accounting process.	4.33	.758
C5	Fair value based standards suffer from ambiguity because fair value accounting is still in a nascent state of evolution	4.04	.641
C6	Extra knowledge and on hand FVM training can completely remove standards ambiguity.	1.96	1.82
	FVM Complexity		
D1	Financial Statements based on FVA are too complex for the understanding of layman investor	4.11	.626
D2	Current practices related to ascertainment of fair values usually based on managerial estimation which enhance the complexity of audit process	3.34	.580
D3	Providing information on fair value in addition to cost value sometime makes the financial statement difficult to understand.	2.97	.659

D4	Additional disclosure and guidelines can completely can ease the complex valuation process.	3.33	.621
	Managerial Bias		
E1	The present FVM strategy provides opportunities for managerial manipulation	4.24	.973
E2	Management prefers to classify ambiguous input cases into level 2 input more than level 3	4.03	.991
E3	Classification of fair value input in FVM hierarchy is a complicated job for managers	3.73	.940
	Knowledge and Understanding		
F1	Auditors are adequately conversant with the FVM standards prescribed by the regulators.	3.96	.670
F2	FVM auditing require expertise understanding of economics and mathematics instead of accounting & auditing	4.23	.767
F3	Advance knowledge & training on data analytics will increase quality of FVM auditing	4.06	.638
	Valuation Specialists		
G1	Valuation specialist play a valuable role in the overall scheme of audit of FVMs	4.16	.825
G2	Valuation specialists are mostly required for level 2 and level 3 inputs as compared to level 1	4.11	.833
G3	The job role of a valuation specialist requires a different set of knowledge and training skills from that of the accountant/auditor	3.75	.788
G4	Valuation specialist negatively affect the organizational culture	3.78	.825
	Professional Skepticism		
H1	Skepticism is a critical factors in FVM auditing and level of skepticism used is positively correlated with different hierarchy level	4.23	.670
H2	Auditor skepticism is affected by the ambiguities and complexities of auditing standards	4.17	.767
H3	FVM auditing process needs a judgment framework and skepticism continuum	2.90	.638
H4	Preciseness among auditing standards has a positive relationship with the application of professional skepticism.	3.26	.656
	Presentation & Format		
I1	Fair value based measurement comprise high level of subjectivity and uncertainty that negativity affect the readability of financial statements	3.69	.686
I2	Extra disclosures for fair values in respect of assets and liabilities that are reported at historical cost will add useful informational value to the financial statements	4.06	.812
I3	Additional disclosures could be stipulated by standard setters to help stakeholders in understanding fair value in financial statements	4.08	.686
	Audit Fee		
J1	There is positive association between audit fee and different levels of FVM inputs.	4.04	.630
J2	The increase in audit cost is compensated by improvement in quality of financial reporting under FVM	4.08	.787
	Cognitive Limitations		
K1	The accuracy of fair value measurement are constrain by cogitative limitation of managers and auditors'	4.41	.670

K2	Psychological heuristics and biases have a more significant effect on Fair value auditing compare to conventional audit	4.05	.767
Audit firm relationship with other firms			
L1	The Relationship between members of different audit firm affect their auditing process	3.93	.753
L2	The market dynamics between various audit firms are significant contributor to the standard setting process	4.01	.894
Audit firm reputations			
M1	Audit firm reputations play a major role in auditors' decision making process	2.23	.802
M2	There is positive association between FVM audit quality and Audit firm reputations	2.73	1.10

4.2.2 Data screening

Before commencing the main data analysis, data screening of the original data was performed to create a raw data file and establish a foundation for honest data analysis (Kline, 2005; Hair et al., 2006). Hence, the raw data was checked for missing values, outliers, factorability and sampling adequacy so that the informed decision can be made to ensure the correctness and validity of the data for main analysis (Mertler and Vannatta, 2002).

4.2.3 Missing values

In the data screening procedure, the foremost consideration was given to handle the missing data as one of the most popular issues in data analysis. The presence of missing values in the data can deviate the results of the data analysis (Tabachnick and Fidell, 1996). Schlomer, Bauman and card (2010) stated that every quantitative study should account the nature and extent of missing values, as well as the procedure followed to handle the missing data. There are widely recognized methods are proposed regarding the nature of missing data such as pairwise deletion and list wise deletion. In list-wise deletion or popularly known as complete case analysis, all cases that have any missing values present in the data are deleted. While pairwise deletion or available case analysis estimates moments for all pairs of cases in which all data is present. In this method all the cases are excluded from only operations in which data are missing on a variable that is required (Bennett, 2001; Roth, 1994). Apart from these two, there are various data imputation approach that can be used for missing value correction i.e. Mean, regression substitution, fuzzy K-means or K-nearest neighbor's imputation etc.

In this study, list wise deletion method was employed to address the missing values in the data set. Out of 250 collected responses, 10 respondents did not answer at least one question among the total of 42 items. Therefore, all of the 10 cases were deleted from the data analysis resulting into a sample size of 240. Furthermore, various estimation methods were used to ensure the suitability of the data for further analysis.

4.2.4 Outliers

The presence of outlier in the data can potentially distort the correlation estimates in the data (Stevens, 1984), estimates of item-factor correlation such as Cronbach's alpha (Christmann and Van Aeist, 2006). The other main area of attention which was addressed in the data set is outliers. An outlier is a case with a score that lies an abnormal distance from rest of the cases

(Barnett and Lewis, 1985). Further, Hawkins (1980) defines an outlier as an observation that deviates so much from other observations as to arouse suspicion that it was generated by a different mechanism. Outlier identification is often considered as one of most significant part of data cleaning, as their presence may lead to abnormal parameter estimation or model misspecification (Williams et al., 2002; Liu et al., 2004). Two widely acknowledged graphical techniques are used for identifying outliers such as scatter plots and box plots. This study used box plots to address the issue of outliers in the data set. Tukey introduced the Boxplot as a graphical display for describing the behavior of the data in the middle as well as at the ends of the distributions The Boxplot, which is being extensively used up to date, is based on the distribution quadrants. The first and third quadrants, Q1 and Q3, are used to obtain the robust measures for the mean, ^¹n = (Q1 + Q3)/2, and the standard deviation, ^¾n = Q3 ¡ Q1. IBM SPSS 20 was used to inspect the outliers of the data. After careful examination of the box plots, one case was detected as outlier and dropped from further analysis resulting into a final sample size of 239 for data analysis.

4.2.5 Factorability

Factorability is considered as one of the important assumption before commencing with the factorization of a set of variables, the strength of the relationships are evaluated by reviewing the correlation matrix generated from the data. Factorability was tested using correlation matrix to ensure that there are at least some correlations among the variables so that coherent factors can be identified. Generally, correlation exceeding 0.30 provide enough evidence to indicate that there is enough commonality to justify comprising factors (Tabachnick and Fidell, 2001). Correlations less than 0.30, question the appropriateness of factors analysis for particular case as it means that a third of the variables share too much variance, and hence becomes impractical to determine if the variables are correlated with each other or the dependent variable.

Following methods were used to examine the degree of collinearity among variables.

4.2.6 Inter-item correlation

The correlation matrix provides a sufficient evidence of multicollinearity among the variables to justify factor extraction before attempting factor analysis. Multicollinearity is defined by moderate correlation among each pair of variables. Two variables that show the higher than 0.80 correlations should consider eliminating from the analysis (Field, 2009). This study employed

inter-item correlation as suggested by Churchill (1979). Cronbach's alpha values along with the inter-item and item-to-total correlations were analyzed to check the significance of the items. Items having the lowest values (3 items) of item-to-total correlation were deleted in cases where deletion increased alpha values; in cases where deletion did not increase alpha values, items were not deleted. The items were deleted until Cronbach's alpha does not reach to its minimum acceptable value (i.e. 0.60) and alpha value started decreasing as suggested by Nunnally (1978). Thereafter, the list of 39 items was finalized for further data analysis.

Table 4.2: Reliability Statistics

Cronbach's Alpha	Number of Items
.723	39

4.2.7 Measures of sampling adequacy (MSAs):

Before extracting the factors, Kaiser–Meyer–Olkin (KMO) measures and Bartlett's test of sphericity were used to ensure the inherent sufficient correlation in the sample data. Kaiser (1974) concludes that KMO values lying between 0.5 and 0.7 are treated as mediocre, values between 0.7 and 0.8 are good, and values between 0.8 and 0.9 are great for factor analysis. KMO value was 0.629 (See Table 4.3), greater than 0.50 and acceptable. Abidin et al. (2009) stated that values below 0.50 imply that data may not be appropriate for conducting factor analysis. The Bartlett's test of sphericity is a statistical test to check that the variables used are uncorrelated to each other (Subbaiah et al., 2011). The Bartlett's test of sphericity was 0.000, which is below 0.05 and hence acceptable. Once the appropriateness of factor analysis is determined, adopt the factor analysis process that consists of selecting the method to extract and rotation method to interpret the factors (Subbaiah et al., 2011). Results as shown in Table 4.3 reveal that the value for the Bartlett test of sphericity was significant for all the factor analysis (Bartlett, 1950).

Table 4.3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.703
Bartlett's Test of Sphericity	Approx. Chi-Square	3375.806
	df	741
	Sig.	.000

Thereby, it can be concluded that the response set is free from the existence of missing values, outliers; and factorability of the data set was ensured by using various statistical method such as inter-item correlation analysis, communalities, Cronbach's alpha and measures of sampling adequacy to validate the study variables those were considered for subsequent analysis.

4.2.8 Data analysis

The intent of this study is to explore and prioritize the factors affecting the auditors decision making process in FVM auditing through the tested analytical methods agree with the true characteristics simulated in the population. Because of the explorative nature of this study, three-step analytical strategy comprising of exploratory factor analysis, analytical hierarchical process and interpretive structural modeling was followed for data analysis using IBM SPSS 20 and Microsoft Excel 2010 packages. Exploratory factor analysis explains latent variables and purifies the scale via observed items and specifies their measurement characteristics in terms of reliability and validity. Analytical hierarchical process was carried to assign the priority weights to several criteria and sub-criteria in the proposed hierarchy. Interpretive structural modeling was used to establish the inter-relationship among predefined factors.

4.3 Exploratory Factor Analysis

To uncover the structural relationship between variables and reduce the number of variables into unobserved unrelated variables from correlated variables, factor analysis was carried out. DeCostre (1998) defined factor analysis as "factor analysis model proposes that each observed response is influenced partially by underlying common factors and partially by underlying unique factors". "Factor analysis does not tell the meaning of the factors. It is purely a statistical technique indicating, which, and to what degree, variables relate to an underlying and undefined

factor. The substantive meaning given to a factor; is typically based on the researcher's careful examination of what the high loading variables measure" (Kim and Mueller, 1978).

As a first step towards exploratory factor analysis, the sample data for 46 variables are subjected to pre-testing which involved, test of reliability, inter-item correlation, sample size adequacy and test of factorability (See Section 5.2.3). The whole data screening process leaves us with 39 variables that indicate that the data is suitable for factor analysis. Principal component analysis (PCA) was performed to extract the factors and simply the factor structure of a set of items, or in other words, high-item loadings on one factor and smaller item loadings on the remaining factors (Costello and Osborne, 2005). Principal component analysis is recommended to establish preliminary solutions when no prior theory or model exists (Gorsuch, 1983).

4.3.1 Determining factor extraction

In order to produce scale unidimensionality, and simply the factor structure several criteria are offered to researchers. However, due to the confusing nature of factor analysis, researchers are assumed to adapt several criteria to determine the factor extraction (Osborne and Costello, 2005). There are three ways to determine the number of meaningful factors that must be retained for interpretation (Cattell, 1966; Stevens, 1986). Many extraction rules and approaches include: the eigen value criteria (Kaiser, 1960), the scree plot (Cattell, 1966), and the cumulative percentage of variance explained (Williams et al., 2010). This study uses multiple approaches to extract the meaningful factors.

4.3.2 Eigenvalue criteria and Cumulative Percentage

The eigen value criteria (eigenvalue > 1 rule), also widely recognized as the Kaiser criteria states that number of factors selected must be equal to the number of factors that have eigen value more than one. Cumulative percentage of variance is an area of discrepancy in the factor analysis where no fixed threshold exists for different disciplines such as humanities, natural sciences and psychology (Henson and Roberts, 2006). Although, Hair et al. (1995) have suggested that cumulative explained variance should be greater than 60 percent in humanities. Table 4.4 demonstrates a cumulative percentage of variance of 65.26% and a total of twelve components having eigenvalue > 1.

The interpretation of Scree plot is subjective in nature and requires the judgment of researcher

Table 4.4: Eigenvalues and cumulative variance explained using EFA

Comp-onent	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	4.970	12.743	12.743	4.970	12.743	12.743
2	3.318	8.509	21.252	3.318	8.509	21.252
3	2.634	6.753	28.005	2.634	6.753	28.005
4	2.479	6.358	34.362	2.479	6.358	34.362
5	2.292	5.876	40.238	2.292	5.876	40.238
6	1.967	5.045	45.283	1.967	5.045	45.283
7	1.808	4.636	49.919	1.808	4.636	49.919
8	1.636	4.195	54.114	1.636	4.195	54.114
9	1.562	4.005	58.119	1.562	4.005	58.119
10	1.337	3.428	61.547	1.337	3.428	61.547
11	1.217	3.119	64.666	1.217	3.119	64.666
12	1.162	2.980	67.646	1.162	2.980	67.646

Extraction Method: Principal Component Analysis.

4.3.3 The Scree plot

(Gorsuch and Venable, 1983; Thompson, 2004; Tabachnick and Fidell, 2007). Scree test explains that one should plot the eigen values on graph and observe the “break” between the high eigen values and low eigen values. Factors that appear before the break are assumed the meaning factors to retain. If the graph drips abruptly, followed by a straight line with much smaller slope, choose number of factors equal to the number of eigenvalues before the drop in the graph (Hatcher, 1994; Dillon and Goldstein, 1984). Scree plot indicates a straight line after twelve components, which indicates that data should analyze for twelve factors as shown in Figure 5.7.

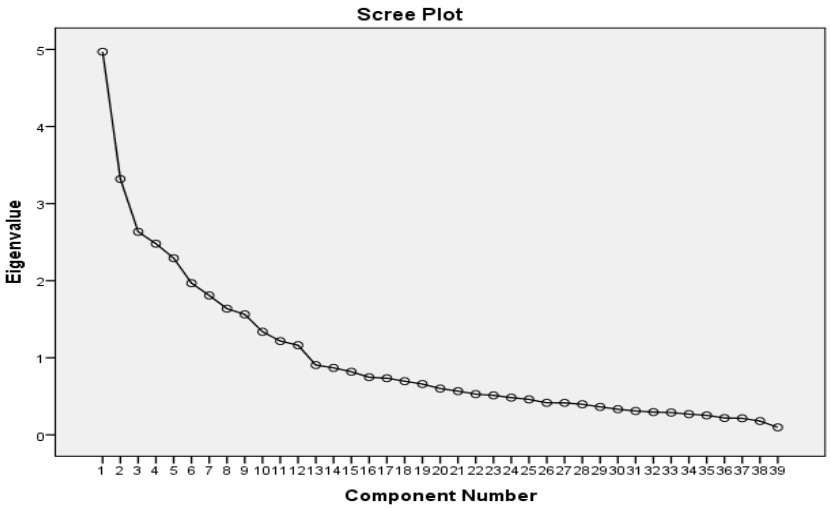

Figure 4.1: Scree Test Criterion

4.3.4 Rotational method

Following principal component analysis and deciding the number of factors for analyzing the data, one must consider that one variable might associate with more than one factor. Rotation provides a more interpretable and simplified results by maximizing the high item loadings and minimizing the low item loadings. Orthogonal Varimax rotation, a widely used rotational technique in factor analysis was used for this study (Thompson, 2004). According to Costello and Osborne (2011), it generates an uncorrelated and simple factor structure. The varimax method is the widely acknowledge method and was used to rotate the principal component solutions. Rotated component matrix was carried out to ascertain the latent factor structure within the variables and the seven identified factors are arranged in the descending order of factor loadings. Rotated component matrix was drawn using Orthogonal Varimax factor rotation method as shown in Table 4.5. Factor loading = or > 0.50 was acceptable as a significant cut-off value.

Table 4.5: Rotated Component Matrix

Rotated Component Matrix[a]												
V	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Not adequate guidelines/standards for estimating fair value…	.907											
Some fundamental changes are required at regulator level ….	.899											
Focused training on FVM is required as part of professional …	.834											
Advisory facilities for accounting and auditing fraternity…..	.754											
Independent supervisory outfit on the lines of PCAOB……	.679											
Auditors' difficult due to estimation uncertainty of FVMs…..		.733										
The lack of supporting tangible evidence…..		.727										
Limitations to the successful adoption of fva based accounting..		.705										
Economies does not have ample depth in their market…….		.696										
Subjective assumptions makes it difficult to audit…….		.687										
high level of opportunity for exercise of auditors' discretion….			.777									
not provide clear direction for fair value input classification….			.772									
Many are auditing standards are ambiguous in nature……..			.694									
Intrinsic nature of underlying accounting process…….			.682									
fair value accounting is still in a nascent state of evolution……			.668									
Too complex for the understanding of layman investor…….				.894								
managerial estimation enhance the complexity of audit process				.874								
Providing information on fair value in addition to cost value…				.862								
FVM provides opportunities for managerial manipulation….					.880							
Manager prefers classify ambiguous input cases into level 2..					.854							
Classification of fair value input is complicated for managers					.655							
Auditors conversant with the FVM prescribed by regulators….						.809						
Understanding of economics and mathematics instead…….						.794						

Advance knowledge & training on data analytics…….						.692						
V. specialist play a valuable role in the overall audit of FVMs.							.748					
V. specialist need different set of knowledge and training skills							.748					
V. specialists are mostly required for level 2 and level 3……							.697					
Critical factors in auditing and level of skepticism is correlate..								.790				
Skepticism is affected by the ambiguities and complexities…..								.709				
FVM auditing process needs a judgment framework……..								.656				
Additional disclosure negativity affect readability of financial..									.737			
Extra disclosures for fair values add useful informational……									.731			
Additional disclosures help in understanding of fair value…..									.697			
FVA standards involves massive escalations in audit costs…..										.864		
Increase audit cost is compensated by improved audit quality..										.822		
Accuracy of FVM are constrain by cogitative limitation…											.818	
Cogitative limitations have a more significant effect on FVM..											.713	
Relationship between members of different audit firm affect…												.886
Market dynamics between various audit firms are significant…												.628
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.												
a. Rotation converged in 7 iterations.												

4. 4 Interpretation and labelling

The next step was to examine the variables those were attributed to a factor, and providing a factor so as to provide the meaningful interpretation (Henson and Roberts, 2006; Williams *et al*., 2010). The labelling of a factor represents a theoretical, subjective and inductive process (Williams *et al*., 2010). Each of the factors extracted for rotation and interpretation is provided a suitable title based on their statement loadings. To give a suitable title to each factor, the initial variables have been carefully analyzed and their correlation between those variables has been observed. After thorough examination of variables, a common description is provided to every single factor for further interpretation. It is important that these labels or constructs reflect the theoretical and conceptual intent.

4.4.1 Regulators

Regulatory structure of any country extensively affects the audit quality of firms. For instance, in the aftermath of the economic crisis of 2008-09, auditory compliance levels improved massively due to the stringent supervision of Securities Exchange Commission and the deterrent effects of the demise of Arthur Andersen (the auditor of Enron) together with penalties and disciplinary actions on some of its professional staff members (Hughes and Tett 2008). The findings of this study are in line to the previous study as PCA method reveals that "Regulators" are vital determinant in FVM audit process (Vyas, 2011). Papadimitriou et al. (2013) also highlighted the importance of effective supervision and swift response from the regulator in distress times.

Regulators shows 12.743 of total variance and rotation sum of squared loading shows that this factor explains 9.657 percent of the total variance. The underlining variables or statements include that regulators are responsible for both designing the acceptable norms and regulations for contemporary FVM environment. Earlier academic research also acknowledge the significance of regulators role in FVM auditing (e.g., Carmichael 2004; Church and Shefchik 2011; Glover et al. 2015; PCAOB 2011, 12 and 13).

4.4.2 Estimation Uncertainty

International Standards on Auditing (ISA) 540 (2008) defines estimation uncertainty as the susceptibility of an accounting estimate and its related has become a major characteristic of FVM reporting system because of the very nature of the measurement methodology and process. Added to this is the auditor's practical compulsion to rely on substantive managerial

assumptions as part of the inputs for ascertaining fair values. This factor accounts for more than 8.509 percent of the data variance. After rotation, this factor represented by the variables those explained more than 7.472 percent of the variance in the dataset. Especially, level 3 of FVM hierarchy, which largely based on unobservable market inputs and managerial assumptions. These assumptions are commonly subjective in nature, which makes it very difficult for auditors to arrive at precise results of FVMs. This aspect has been highlighted regularly in the literature e.g. Cannon and Bedard 2014; Bratten et al., 2013; Griffin 2014.

4.4.3 Standards Ambiguity

The fourth factor derived from the PCA method is labeled as "Standards Ambiguity". This factor explains the 6.753 percentage of the total variance and about 6.952 percent after Varimax rotation. The inspection reports of PCAOB (2007) acknowledge the fact that auditing standards related to fair value are ambiguous. In many situations, adoption of standards is left entirely on auditor's discretion e.g. goodwill impairment may be audited under the provisions of AU328 or AU 342 (Bratten et al. 2013). Moreover, current accounting standards provide no specific guideline on testing of various managerial assumptions i.e. auditors can choose to test the model, and data or can develop his own independent estimate Similarly, setting the level in the input hierarchy of an account is discretionary (Christensen et al. 2013).These discretionary provisions act as serious impediments for auditors to provide audit assurances in FVMs.

4.4.4 FVM Complexity

The fifth factor extracted from the analysis is known as FVM Complexity. FVM complexity is largely embedded in the definitions and measurement processes involved in the fair value accounting e.g. managerial assumptions, estimation uncertainties and lack of available data. Accounting areas that are particularly complex include accounting for derivatives, intangibles and goodwill accounting (Cannon and Bedard 2014). This factor accounts for 6.358 percent of the total variance and after rotation, it arrives at 6.345 percent. Complexity in auditing in a fair value environment arises and can be analyzed from various perspectives. Complexity at a fundamental level arises because the process involves three critical and interactive factors of the judgment process—the environment, the task, and the person (Bonner 2008; Bratten et al. 2013). Complexity in FVMs also arises due to the methodologies involved in the ascertainment of fair

values and their audit. Furthermore, issues of application and implementation like auditor biases also create complexity in fair value audit process.

4.4.5 Knowledge and Understanding

A detailed knowledge and understanding of company FVM audit process is must for auditors (AU328). In particular, auditors should not only focus on final assumption, but also understand the systematic process of assumption derivation (AU Sec. 328.18). Griffith et al. (2012) highlight the limitation of current FVM practice and find that majority of FVM auditing is still conducted by inexperienced staff. Moreover, FVM auditing require expertise understanding of economics and mathematics instead of accounting & auditing, which many contemporary auditors lack in their knowledge. Bratten et al. (2013) has recommended setting up of arrangements for dispensation of specialized knowledge and training on FVM valuation related issues. Lack of sufficient expertise for a full-fledged implementation of the fair value philosophy is very evident in developing nations (Kumarasiri and Fisher 2011). This factor explains the 5.876 percentage of the total variance and about 5.661 percent after Varimax rotation.

4.4.6 Managerial Bias

As mentioned in clause (iii) hereof, managerial assumptions, on which the FVM audit process heavily relies, are usually subjective. This opens up numerous opportunities for managerial manipulations. It is, thus, natural that any management bias in inputs to the auditor would percolate to the final FVM results. Irrespective of its form (intentional or unintentional), managerial bias leads to earning management, cognitive biases and limitations in FVM judgment process (Sapaer and Rao 2008; Martin et al. 2006). This factor has disclosed the 5.045 percent variance, but the rotation sum of squared loadings explicates the 5.081 percent of the total variance. The main variables incorporate are opportunities for managerial manipulation, management preference towards 2 input more than level 3 and manager's difficulty in input classification. Moreover, fair value is essentially a market based input but manager generally has access to private information regarding the firm's operations that adversely affect the overall costs and benefits of this measurement and distort the manager's incentive to carry out valuation (Dutta and Zang, 2006; Dutta, 2008)

4.4.7 Valuation Specialists

In auditing, specialist is any individual or firm that has special expertise or knowledge in a particular field except accounting or auditing (AU 336).The complexity involved in fair value measurements and uncertainties that are associated with the estimation thereof have generated the need engage valuation specialists with high level specific sector knowledge and expertise on various occasions in the FVM auditing process (AU 328). Outputs from these valuation specialists directly and significantly affect auditors' decision-making process and the level of their concern against bias in estimation (Joe et al.2014;Griffith et al. 2014).Used conservatively, valuation specialists play a valuable role in the overall scheme of audit of FVMs. Nevertheless, there is evidence of occasional overdependence of auditors on such valuation specialists (Glover et al.2014). It needs also be emphasized that auditor is accountable for the veracity of the audit and as such for the reliability of the output of valuation specialist and hence his competency. This factor explains about 4.636 percent variance and after rotation, it accounts for above 5.049 percent of the total variance in the dataset.

4.4.8 Professional Skepticism

The seventh factor extracted from the factor analysis is named as Professional Skepticism. It is an attitude that includes a questioning mind and a critical assessment of audit evidence (AU230).PCAOB standards as well as academic research (McMillan & White 1993; Nelson 2009) acknowledge the need of skepticism in FVM auditing and refer to it as fundamental for audit quality and the integrity of the audit process. It accounts for 4.195 percent of the total variance and after rotation, it arrives at 4.968 percent. Doliya and Singh (2016) concluded that that level of skepticism used is also positively correlated with the FVM hierarchy level. Additionally, it also affected by the ambiguities and complexities of auditing standards.

Majority of auditors fail to use the proper level of skepticism in FVM auditing and needs a judgment framework and skepticism continuum (Backof et al. 2014; PCAOB Inspection Report2012, 2013). Professional skepticism required knowledge of audit risk and evidence, ability to identify error and non-error and understating of the high risk pattern in financial statements (Nelson 2009).

4.4.9 Presentation and Format

The next factor incorporates the various variables associated with appearance and structuring of financial statements. Thus, this factor is labeled as Presentation & Format. It has been established that Fair value based measurement comprise high level of subjectivity and uncertainty that negativity affect the reliability of financial statements. Clor-proell et al. (2014) highlight this issue and conclude that various assumptions and high-level subjectivity negatively affects the information-oriented objective of financial statements. This factor has disclosed the 4.005 percent variance, but the rotation sum of squared loadings explicates the 4.609 percent of the total variance. The main variables incorporate are framing of procedures (negatively or positively) and role of additional disclosures enforced by FASB and International Accounting Standard Board (Information overload) that affect the auditor's decision making process (Maksymov et al. 2012).

4.4.10 Audit Fee

The tenth factor extracted from the analysis is known as Audit Fee. Audit fee can be term as the compensation received from the client for audit-related services (Doliya and Singh 2015). The authors have come across very limited literature on the association between audit fees and fair value (Goncharov et al. 2012). Auditing of FVA based standards involves may escalate audit costs for the company but increase in audit cost can be compensated by improvement in quality of financial reporting under FVM. Mohrmann et al. and Ettredge et al. (2014) also find the positive association between abnormal audit fee with fair value disclosure and with and different levels of FVM inputs. This factor accounts for 3.428 percent of the total variance and after rotation, it arrives at 4.142 percent. It examines the variables or statements such as valuation specialist effect on audit committee, audit fee impact on audit quality and cost effectiveness.

4.4.11 Cognitive Limitations

The Eleventh factor derived from our analysis labeled as "Cognitive Limitations". This factor explains the 3.119 percentage of the total variance and about 3.990 percent after Varimax rotation. As noted above, FVM auditing is a complex job for auditors and negatively affect the individual ability to audit. This factor explains that environmental uncertainty and task difficulty compound the processing limitations and leads to several psychological heuristics and biases i.e. known preferences, anchoring and adjustment prior period balances bias and curse of knowledge (Kinney and Uecker 1982, McDaniel and Kinney 1995, Earley 2002, Jenkins and Haynes 2003, Bratten et al. 2013.)

4.4.12 Audit firm relationship with other firms

The last factor extracted from the factor analysis is named as Audit firm relationship with other firms. In addition to compulsory relationship (with regulators), certain mutually agreed relationship (other audit firms) may affect the quality of audit. These non-regulatory relationships together with audit firm specific traits could also affect the FVM audit. For example, audit firm completion with other audit firms in market for clients and labor will affect the FVM audit quality (Bratten et al. 2013). This last factor accounts for 2.980 percent variance and after rotation, it explains the 3.719 percent variance of the total variance in dataset

4.5 Reliability

The statistical reliability of the scale was assessed in order to check the extent to which the set of research constructs are consistent in what they are intended to measure. Ormrod and Leedy (2005) refers to the reliability of a measurement scale, "the extent to which it yields consistent results when the characteristic being measured has not changed". It is considered as a tool to measure the accuracy and precision of the constructs. In this study, we have computed the Cronbach's alpha coefficient values to check the reliability of each of the constructs. It is recommended that the Cronbach's coefficient should be equal to or greater than 0.60 for good internal consistency among the items within each construct (Gerbing and Anderson, 1988; Fornell and Larker, 1981; Hair *et al.*, 1998). The Cronbach's coefficient for top ten factors was ranged from 0.68 to 0.89 that is above the threshold value of 0.60 as shown in Table 4.6. Thus, the findings of this reliability analysis show the good internal consistency among the variables within each factor

Table 4.6: Reliability analysis

S. No.	Factors	No. of items	Cronbach's alpha (α)
1	Estimation Uncertainty	**5**	.892
2	Regulators	5	.783
3	Valuation Specialist	5	.778
4	Standards Ambiguity	3	.858
5	FVM Complexity	3	.776
6	Managerial Bias	3	.695

7	Professional Skepticism	3	.655
8	Presentation & Format	3	.658
9	Knowledge and Understanding	3	.604
10	Audit Fee	2	.686
11	Cognitive Limitations	2	.554
12	Audit firm relationship with other firms:	2	.566

Source: Based on author's calculation

4.6 Validity

After analyzing the reliability of the scale, assessment of statistical validity of the scale is another important concern. The validity of a measurement scale refers to "the extent to which the instrument measures what it is actually intended to measure" (Ormrod and Leedy, 2005). Convergent validity and discriminant validity are used to assess the existence of validity among the constructs.

4.6.2 Convergent validity

Convergent validity represents "the extent to which the scale correlates positively with other measures of the same constructs" (Malhotra and Dash, 2010). Convergent validity of a construct refers to the degree to which multiple measures of a construct are correlated (Hair *et al*., 2010). To ensure meaningful results, convergent validity was assessed by factor loading and Average Variance Extracted (AVE) and Composite Reliability (CR) values followed by the studies of Fornell and Larcker (1981), Gerbing and Anderson (1988) and Hair *et al*. (1998). Average Variance Extracted (AVE), used as a standard to measure the convergent validity (Fornell and Larcker, 1981), indicates to "average amount of variation that a latent construct is able to explain in the observed variables to which it is theoretically related". An AVE value greater than or equal to 0.5 indicates convergence of the items at the construct level (Ringle *et al*., 2009). In the present study, each measure satisfies the suggested threshold, and the values of average variance extracted confirmed the convergent validity as shown in Table 4.7.

4.6.2 Discriminant validity

Hair *et al*. (2010) refers the discriminant validity as the degree to which two conceptually similar concepts are different. In this study, following the approach of Fornell and Larcker (1981), discriminant validity is assessed when the value of AVE of each latent variable is

Table 4.7 Discriminant and Convergent validity

Factors	CR	AVE	MSV	ASV	1	2	3	4	5	6	7	8	9	10	11	12
1	0.82	0.67	0.34	0.33	**0.818**											
2	0.71	0.51	0.52	0.49	0.174	**0.714**										
3	0.72	0.52	0.48	0.48	0.252	0.206	**0.721**									
4	0.88	0.77	0.33	0.23	0.460	0.409	0.039	**0.877**								
5	0.80	0.64	0.37	0.36	0.298	0.189	0.506	0.622	**0.80**							
6	0.77	0.59	0.44	0.41	0.173	0.171	0.305	0.052	0.334	**0.768**						
7	0.73	0.53	0.50	0.47	0.052	0.270	0.146	0.100	0.109	0.240	**0.854**					
8	0.72	0.52	0.48	0.47	0.040	0.363	0.128	0.026	0.022	0.501	0.037	**0.721**				
9	0.72	0.52	0.51	0.48	0.137	0.022	0.008	0.015	0.476	0.221	0.369	0.658	**0.721**			
10	0.84	0.71	0.37	0.29	0.093	0.047	0.099	0.164	0.061	0.025	0.355	0.213	0.357	**0.842**		
11	0.77	0.59	0.43	0.41	0.045	0.276	0.240	0.166	0.099	0.223	0.048	0.279	0.296	0.129	**0.768**	
12	0.76	0.58	0.38	0.42	0.089	0.053	0.065	0.018	0.158	0.276	0.285	0.313	0.064	0.463	0.382	**0.761**

Note: Diagonal Elements are the square root of AVE Values. CR= Composite Reliability, AVE=

greater than its squared correlation coefficient. For robustness purpose, CR should be greater than AVE and the value of AVE should be greater than both MSV and ASV (Hair *et al*., 2010). Table no 4.7 represents values of all the mentioned parameters to be within their respective acceptable limits. As shown in Table 4.7, these conditions were satisfied, hence, the Discriminant validity of the measurement was confirmed to be reliable and valid.

Average Variance Extracted, MSV= Maximum shared variance, ASV= Average shared variance

(Summation of squared factor loadings)/ (Summation of squared factor loadings) (Summation of error variances) (Fornell and Larcker, 1981).

Think that is the way to go, using standardized loadings:

CR: sum all factor loadings, square this sum (call this SSI); sum all error variances of each indicator (call this SEV); comp rel. = SSI/ (SSI+SEV)

AVE: sum up each squared factor loading; divide it by the number of indicators

Summary

In this chapter, we have applied the behavioral metaphor to explore the factors influencing auditor's decision making in FVM audit process. For this purpose, we have carried out a principal component analysis on the collected data to extract the meaningful factors that may influence the auditors' decision making process in FVM audit. A questionnaire was developed and the reliability and validity were tested through various tests such as Cronbach's alpha, KMO and Bartlett's and validity of the constructs are tested. Based on factor analysis results, this study explored the insights from the various stakeholders' perspective on the determinants of FVM audit process. Factor analysis extracted the twelve factors, namely: Estimation Uncertainty, Regulators, Valuation Specialist, Standards Ambiguity, FVM Complexity, Managerial Bias, Professional Skepticism, Presentation & Format, Knowledge and Understanding, Audit Fee, Cognitive Limitations, Audit firm relationship with other firms. The results of this section give an insight that auditor's decision making process in FVM auditing involve multi-criteria decision-making (MCDM) approach.

CHAPTER 5

PRIORITIZATION OF FACTORS AFFECTING FVM AUDIT PROCESS

Preview

This Chapter discuss application of Analytic Hierarchy Process (AHP) in FVM auditing and develop a hierarchical ranking of critical factors in auditors' decision making process in FVM auditing. This chapter use Bonner (2008) framework and classify identified factors under Task related, Environmental and Auditors specific factors. Further, it prioritize these pre-determined factors according to their weights assigned. In the end the robustness of model is checked with change in task related factors of ranking.

CHAPTER 5

PRIORITIZATION OF FACTORS AFFECTING FVM AUDIT PROCESS

5.1 Introduction

Auditing fair value measurements (FVM) and other complex accounting estimates has become one of the most challenging exercises for auditors in the contemporary accounting environment that is laced with the growing acceptance of reporting of accounts at fair valuations to the maximum possible extent. The inspection reports of the PCAOB of the United States acknowledge the growing complexities and auditing deficiencies of FVM in last few years (PCAOB 2015, 2014a, 2013, 2012a). The International Forum of Independent Audit Regulators (IFIAR), Canadian Public Accountability Board (CPAB) and FASB also admit the escalating shortcomings in FVM reporting and auditing (IFIAR, 2015, 2014; CPAB, 2012, 2009).

In chapter four, results of EFA reveal that auditors' decision making in FVM audit process needs a multi-criteria decision-making (MCDM) approach. MCDM methods, using established multiple criteria and sub-criteria, seek solutions to complex decision making problems (Saaty, 1994; Gajpal *et al.*, 1994; Wei et al., 2005). While many weighing methods have been suggested in literature for prioritization of factors, analytic hierarchy process (AHP) is one of the most popular MCDM techniques, and has been used in various fields.

Therefore, this chapter introduces the application of AHP in FVM auditing and uses this methodology to prioritize the FVM auditing factors in line with their relative importance. Hierarchical modeling on relative importance is expected to provide deep insights into auditors' decision making processes and may help in improving the quality of audit in complex fair value environment. Further, sensitivity analysis will enable evaluation of the robustness of results.

This chapter starts with the review of literature and justification for AHP in section 5.2 classification of identified factors (Factor Analysis, Chapter 4) under Environmental, Task-related and Auditors specific factors. Afterwards, Analytic Hierarchy Process with its mathematical background discussed with Saaty (1972) algorithm. In the end, AHP application

in FVM auditing explained and robustness of developed model is checked through sensitivity analysis.

5.2 Review of Literature and Justification for AHP

The Analytic Hierarchy Process (AHP) is a structured technique for helping people deal with complex decisions. Rather than prescribing a "correct" decision, the AHP helps people to determine one. Based on mathematics and human psychology, it was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then (Cho *et al.*, 2012; Rao, 2013). The AHP provides a comprehensive and rational framework for structuring a problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions. It is used throughout the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, and education (Johnson, 2009). The Analytic Hierarchy Process (AHP) is a powerful and flexible decision making process to help people set priorities and make the best decision when both qualitative and quantitative aspects of a decision need to be considered (Xue-zhen, 2007).

The oldest reference have been found dates from 1972 (Saaty 1972). Analytical Hierarchy Process (AHP) methodology is envisaged in this research context to enrich the comparative evaluation of the robust and Secure Supply Chain performance (comprising risk and security) in the Indian automotive industries scenario. AHP methodology can optimize the selection of risk and security performance measure followed by relevant choices for decision making with implication. AHP has strength that one level it tries to identify the factors of the secure supply chain for robust performance and at more important level to evaluate these factors and alternative industries based on their current SSC maturity level. AHP is selected for study as it is most robust, widely acceptable and scientific among all MCDM techniques (Saaty, 2000; Ramanathan and Ganesh, 1995; Rao, 2013). It is envisaged that it may be expedient to evolve the AHP based auditors decision making framework to impart qualitative decision making in FVM audit. These levels need to be well supported by literature and expert views.

AHP is a decision-making tool that can help describe the general decision operation by decomposing a complex problem into a multi-level hierarchical structure of objectives, criteria, sub-criteria, and alternatives (Saaty, 1990). AHP can be used in making decisions that

are complex, unstructured, and contain multiple attributes (Partovi, 1994). The decisions that are described by these criteria do not fit in a linear framework; they contain both physical and psychological elements (Mian and Dai, 1999). Analytical Hierarchy Process (AHP) is justified, which facilitates in the entire critical decision making and has the potential to improve existing system of evaluation and decision making. AHP provides a method to connect that can quantify the subjective judgment of the decision maker in a way that can be measured. Data collection, AHP Process and Data Analysis is discussed in next section in this context. Table 5.1 shows the details of select research on AHP.

Table 5.1: Review of Select Research on Analytic Hierarchy Process

S. No	Authors	Area	Journal	Title	Findings
1	Saaty TL	AHP	Pittsburgh – RWS Publications	Fundamentals of decision making and priority theory with the analytic hierarchy process	Fundamentals of decision making and priority theory with the analytic hierarchy process are discussed
2	Gavin R. Finnie, Gerhard E. Wittig, and Doncho I. Petkov	Software Development	Journal of System Software	Prioritizing Software Development Productivity Factors Using the Analytic Hierarchy Process	This article use AHP to prioritize the factors of software development productivity to enhance the overall productivity of software development. They found that "management commitment" is most significant factor in local ranking as well as in global ranking.
3	Gila Albert , OrenMusicant , IlitOppenheim, TsippyLotan	Road Safety	Transport Policy	Which smartphone's apps may contribute to road safety? An AHP model to evaluate experts' opinions	This study used Analytic Hierarchy Process AHP to prioritize the of nine different type of safety app as per various criteria and find that collision warning and voice control apps are likely to get public support.

4	Nisakorn Somsuk, Tritos and Laosirihongthong	Business Incubators	Technological Forecasting & Social Change	A fuzzy AHP to prioritize enabling factors for strategic management of university business incubators: Resource-based view	This study use fuzzy AHP to prioritize fourteen sub factors four key factors viz. funder human, technological, financial, and organizational resources. Using different respondent from Thailand, they found that "Talented managers" are most significant factors in UBI success.
5	Kamal M. Al-Subhi Al-Harbi	Project Management	International Journal of Project management	Application of the AHP in project management	This paper discusses the application of Analytical Hierarchy Process (AHP) as a potential decision making method for use in project management.
6	Rana Pratap Singh, Hans Peter Nachtnebel	Hydropower Strategy	Renewable and Sustainable Energy Reviews	Analytical hierarchy process (AHP) application for reinforcement of hydropower strategy in Nepal	This study use AHP for finding the most appropriate scale of hydropower development for Nepal. They found that medium hydropower schemes are most suitable and EFD (economic, finance, developer) is the most significant factors in optimum scale utilization.
7	Fikri Dweiri, Sameer Kumar, Sharfuddin Ahmed Khah and Vipul Jain	Supply Chain Management	Expert Systems With Applications	Designing an integrated AHP based decision support system for supplier selection in automotive industry	The AHP methodology adopted in this study provides managers in automotive in- dustry in Pakistan with the insights of the various factors that need to be considered while selecting suppliers for

					their organizations.
8	Prem Prakash Gajpal, L.S. Ganesh, Chandrasekharan Rajendran	Inventory Management	International Journal of Production Economics	Criticality analysis of spare parts using the analytic hierarchy process	The AHP has been used for evaluating the criticality of spares. They Use Satty AHP to identify the criticality of different spare parts and the alternative modes for each criterion have been specified.
9	Toshiyuki Sueyoshi, Jennifer Shang c, Wen-Chyuan Chiang d	Internal audit	European Journal of Operational Research	A decision support framework for internal audit prioritization in a rental car company: A combined use between DEA and AHP	This study explores the potential of applying data envelopment analysis (DEA) and analytic hierarchy process (AHP) to determine the business units that need audit.
10	William f. Messier jr., and Arnold Schneider	Auditing	Contemporary Accounting Research	A hierarchical approach to the external auditor's evaluation of the internal auditing function	This study examines the external auditor's evaluation of the internal audit function. This study indicated that the competence of the internal auditors was the most important factor, followed by the objectivity and work of the internal auditors

Note: Complied by author

5.3 Identification of factors

To formalize our discussion, we adopt the Bonner (2008) theoretical research framework, which classifies factors influencing auditors' decision making process into three broad categories viz. (a) environmental factors; (b) task related factors and (c) auditor specific factors. Further decomposition leads to the identification of twelve sub-factors viz. (i) estimation uncertainty, (ii) regulators, (iii) audit firm's relationship with other firms, (iv) presentation & formats, (v) FVM complexity, (vi) ambiguity, (vii) managerial bias, (viii) audit fee, (ix) cognitive limitations, (x) skepticism, (xi) knowledge and understanding and (xii) valuation specialists. We, now, elaborate on each of the above categories:

5.3.1 Environmental Factors

Environmental factors refer to those macroeconomic factors which can directly affect the auditing. They are neither 'task specific' nor 'individual auditor' related (Bonner, 2008). Although, these factors directly affect the quality of any audit, they assume critical relevance in the case of FVM auditing (IAASB, 2011). For our research, we use four distinctive macro environmental factors that play a cardinal role in the FVM audit process viz. (i) estimation uncertainty (ii) regulators (iii) audit firm's relationship with other firms, and (iv) presentation & formats

5.3.2 Task related factors

The auditor's set of responsibilities in FVM auditing is collectively referred to as 'the task' and 'task complexity' is a primary determinant of audit quality and performance (Payne *et al.*, 1993). Task related factors are considered responsible for increasing the processing demand and reducing the auditor's performance through decrease in processing capabilities (Bratten *et al.*, 2013). Because of limitations on processing capabilities, decision-makers are forced to adopt simplifying decision strategies which result in performance reduction of auditors (Bonner, 2008).

We identify four task related factors that may play a crucial role in FVM audit decision making process viz. (i) FVM complexity (ii) ambiguity (iii) managerial bias and (iv) audit fee, each of which is explained below:

5.3.3 Auditor specific factors

PCAOB inspection reports identify several audit deficiencies which are related to auditor specific characteristics including auditor knowledge, use of valuation specialists and exercise of skepticism etc. (PCAOB 2011, 12, 13). Auditor specific factors refer to those factors which, directly or indirectly, affect the auditors' decision making process at the individual level. For our analysis we have identified five such factors viz. (i) Knowledge and understanding (ii) Skepticism (iii) valuation specialists and (iv) Cognitive limitations.

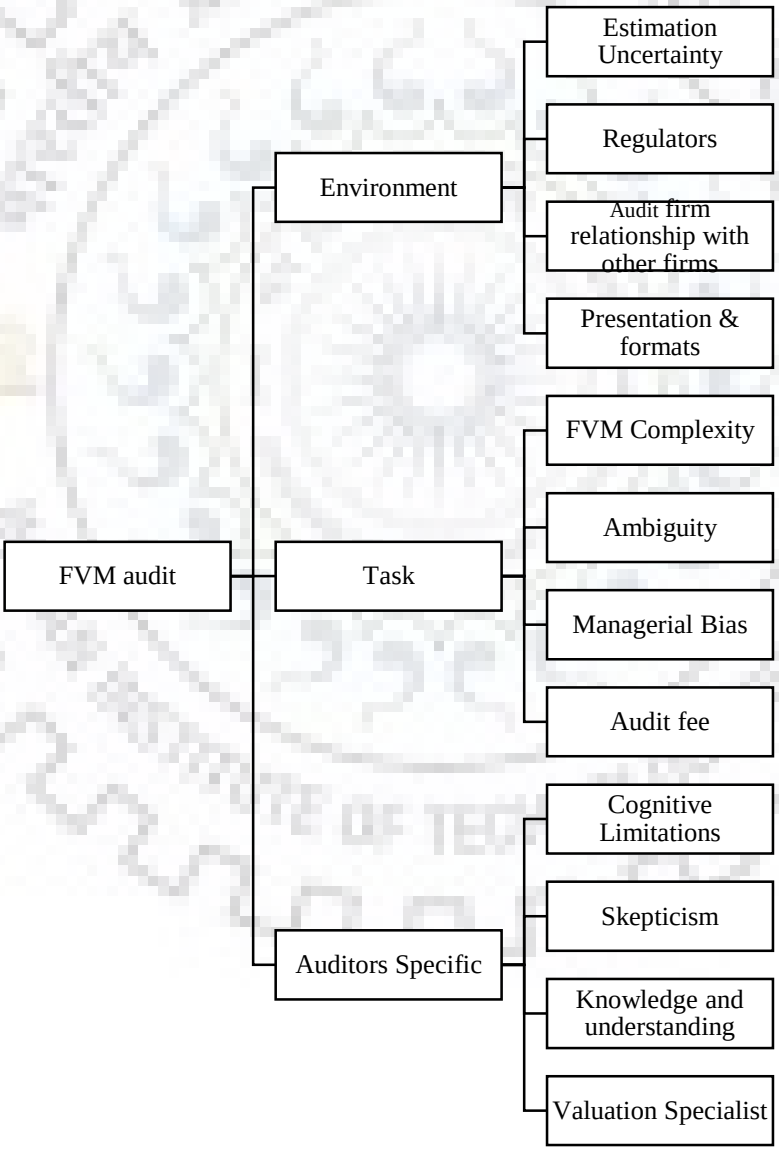

Figure 5.1: AHP Hierarchy of FVM audit process

5.4 Introduction to Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP), developed by Thomas Saaty (1980) is a scientific and mathematically robust methodology that helps in solving the complex socio-economic or multi-criteria decision making (MCDM) problems. MCDM problems are one of the most complicated issues in 'decision theory' as they are affected by the presence and interaction of multiple and conflicting measures, which makes it very difficult to choose among optimum solutions. Of the various mathematical approaches over the years, AHP has become one of the most suitable and popular decision-making method for various complex decision making i.e. for selecting among competing alternatives or for ensuring the optimum distribution of limited resources, prioritization of factors and forecasting (Kumru and Kumru, 2014).

AHP uses a well-defined mathematical structure of consistent matrices, which capture both subjective and objective evaluation measures and break the complex problem into a hierarchy of small levels (Meade and Sarkis, 1998; Kahraman *et al*., 2004). These levels include goal or objective of the problem (top level of hierarchy), criteria and sub-criteria (middle level of hierarchy and alternative design in a hierarchy structure (at the lowest level of hierarchy). It is comprehensive process designed for complex, hard to visualize, or unstructured problems and based on three basic principles viz. i) hierarchies establishment, ii) defining the superiorities and iii) maintaining the logical and numerical consistencies.

AHP provides a great level of flexibility within the hierarchical structure for decision making as all the factors are interrelated with each other and small change in one factor may affect the whole hierarchy. Structuring the decisions within this composition, different types of data can be combined, differences in their performance levels can be aligned, and objects different in nature can be compared to each other. Moreover, it is an all-inclusive framework which allows both qualitative and quantitative input for easing the individual or group decision making process (Saaty, 1989). Particularly, qualitative information analysis which can be highly subjective and complicated for processing has higher acceptability and confidence as compare to other decision making techniques (Zakarian and Kusiak, 1989). Moreover, it permits the sensitivity analysis that can be used for checking robustness of model.

Over the years, AHP has been successfully applied in diverse array of problems; for instance, Ossadnik and Lange (1999) evaluated software using AHP, David (2003) used AHP to determine the performance of management indicators, Hsu and Hu (2008) used AHP to prioritize the GSCM approaches in electronic industry. In area of auditing research, AHP has been used by Messier and Schneider (1988) for internal audit prioritization, Mizrahi *et al*. (2007) for effectiveness of auditing and Seol and Sarkis (2005) for internal auditor selection etc. However, this is the first research that uses AHP for FVM auditing.

5.4.1 AHP Process design

As discussed above, in any complex decision making, the basic problem is the consideration of multiple factors for assessment and the definition of importance, weights, and superiorities. AHP is a systematic approach that establishes a hierarchical structure of these factors for studying the complex and subjective decision making process.

It starts with pairwise comparison of each factor in corresponding level with respect to an element in the upper level for the assessment of relative importance of factors. Subsequently, pairwise comparisons and matrices are formed for analysis. To maintain the effectiveness of model, AHP require to maintain the degree of consistency (measured through inconsistency index) in thinking and judgment level of respondent. However, it is almost impossible to reach a perfect consistency (value of 0 for the index) during these kinds of pairwise comparisons.
AHP can play a significant role in group decision making, Dyer and Forman (1992) state the benefits of using AHP in group decision making through decomposition, comparative judgment and synthesis of priorities. In AHP, group settings are often used where group members either engage in a discussion to achieve a consensus or express their own judgments or preferences. In this process, the judgments given by *n* experts or judges we have to aggregate the responses of *n* judges or experts.

When each individual is acting in his or her own rights, beliefs and systems, we are concerned about each individual's resulting alternative priorities. There are two methods to aggregate the individual judgments. An aggregation of each individual's resulting priorities can be computed using either a geometric or arithmetic mean.

i) Arithmetic mean =

$$\bar{x}_{\text{arithm}} = \frac{1}{n}\sum_{i=1}^{n} x_i = \frac{x_1 + x_2 + \cdots + x_n}{n} \quad \textbf{(5.1)}$$

ii) Geometric mean =

$$\bar{x}_{\text{geom}} = \sqrt[n]{\prod_{i=1}^{n} x_i} = \sqrt[n]{x_1 \cdot x_2 \cdot \ldots \cdot x_n} \quad \textbf{(5.2)}$$

While either an arithmetic or geometric mean can be used for aggregating individual priorities, the geometric mean is more consistent with the meaning of priorities in AHP. In particular, preferences in AHP represent ratios of how many times more important (preferable) one factor is than another (Adamcsek, 2008). Thus, geometric mean was used to calculate the aggregate of individual experts in decision-making process. Further, Saaty (1990) explained AHP process with following simple steps:-

Step 1: Objective of the problem.

Define primary objective or goal of the study.

Step 2: Decomposing of goals and hierarchical structure development

People perception, remembrance and creative thinking develop a hierarchical structure, where leveling depend upon the managerial decision making (Zahedi, 1986; Saaty, 2000). Using the Satty (2000) guidelines a multi-level hierarchical structure is established wherein top level hierarchy is defined as the objective or goal of a problem, next level lists as the level 1 or criteria which needs to be evaluated or prioritized, next bottom level terms as level 2 or sub-criteria and so on

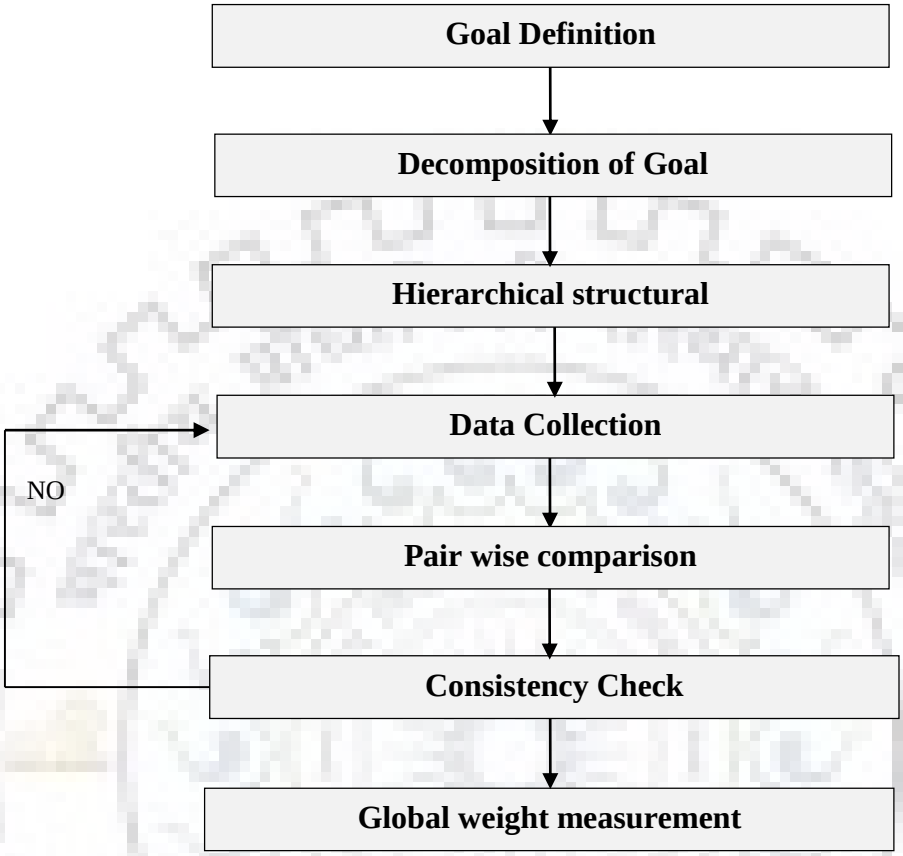

Figure 5.2 Flow chart of analytical hierarchy process

Step 3: Pairwise Comparison

The third step is to develop the pair-wise comparison matrices (n X n) of all the criteria and sub-criteria using a Saaty's nine point scale as shown in Table 5.4. In order to do this, decision-makers need to answer that how much two criteria are important to respective goal. This pair wise comparison generate a positive reciprocal matrix which represents the comparative importance of each factor with respect to the goal of study.

Academic experts, auditors from Big 4 and Non-Big 4 and managers having relevant experience and understanding of auditing fair value measurement were consulted to validate the factors identified, goal of study and to develop the pairwise comparison matrix. The AHP method with large sample size may results in highly inconsistent and impractical results (Pun

and Hui, 2001). A detailed information regarding experts work profile and experience is provided in Table 5.2.

Table 5.2: Profile of Experts Involved in Study

	Designation	Experience	Industry
Expert 1	Professor	15 years	Academia
Expert 2	Professor	20 years	Academia
Expert 3	Auditors	12 Years	Big 4
Expert 4	Auditors	9 Years	Big 4
Expert 5	Auditors	7 Years	Non Big 4
Expert 6	Managers	15 years	BSE 50 Company

Table 5.3: Pair-wise comparison scale for AHP preferences

Numerical rating	Verbal judgments of preferences
9	Extremely preferred
8	Very strongly to extremely
7	Very strongly preferred
6	Strongly to very strongly
5	Strongly preferred
4	Moderately to strongly
3	Moderately preferred
2	Equally to moderately
1	Equally

Source: Saaty, 1980; 1990

Let C_1, C_2 ,…, C_n be the set of elements, while a_{ij} represents a judgment on a pair of elements C_i , Cj. An n -by- n matrix A is derived as follows:

$$A = [a_{ij}] = \begin{pmatrix} 1 & a_{12} & \dots & a_{1n} \\ a_{21} & 1 & \dots & a_{2n} \\ . & . & . & . \\ . & . & . & . \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{pmatrix}$$

In matrix *A* , *aii* =1, *aji* =1/ *aij* , and *i, j* =1, 2,…, *n* . The relations among weights *i w* and judgments *ij a* are simply given by / *i j ij w w* ・ *a* (for *i, j* =1, 2, …, *n*).

Step 4: Calculation of priority weight

After the development of comparative matrix priority weight of factors is calculated with the help of Eigen value and Eigen vector.

$$\lambda_{max} = \sum_{j=1}^{n} a_{ij} \frac{W_j}{W_i} \quad \textbf{Eq. 5.3}$$

Eigenvectors are calculated with the following rule: $Z \cdot W = \lambda max \cdot W$

Where, W=eigenvector value and λmax = highest eigenvector of comparative matrix, Z.

Step 5: Consistency Check

Next is to check the consistency of the judgments determined by using the Eigen value. Inconsistency in the data may lead to vague and inappropriate results. Thus, consistency of the matrices is checked by Consistency Index (CI) and Consistency ratio (CR).

$$CI = \frac{\lambda_{max} - n}{n-1} \quad \textbf{Eq. 5.4}$$

$$CR = \frac{CI}{RI} \quad \textbf{Eq. 5.5}$$

CI denotes consistency index and *RI* is the random index, *n* denotes number of criteria in the matrix and λ_{max} denotes maximum eigenvalue of the matrix of pair wise comparisons. If *CR* <0.1 or 10 percent, the estimate is accepted. The *CR* of each comparison matrix is smaller than 0.1, indicating consistency. RI table is as shown in Table 5.4.

Table 5.4: Random Index

N	2	3	4	5	6	7	8	9
RI	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45

Source: Saaty, 1994

After following the aforementioned steps, the pair-wise comparison matrix of factors and sub-factors and consistency index are presented in the Tables 5.5 to 5.8.

Table 5.5: Pair-wise comparison with respect to the main factors

Factors	Environment	Task	Auditors	Relative weight	Rank
Environment	1.00	0.50	3.00	0.3202	2
Task	2.00	1.00	4.00	0.5571	1
Auditors	0.33	0.25	1.00	0.1226	3

Maximum eigen value = 3.018; C.I. = 0.009.

Table 5.6: Pair-wise comparison with respect to the Environmental factors

Factors	Estimation Uncertainty	Regulators	Audit firm relationship	Presentation & formats	Relative weight	Rank
Estimation Uncertainty	1.00	1/5	5	2	0.2135	2
Regulators	5	1.00	9	3	0.5770	1
Audit firm relationship	1/5	1/9	1.00	1/4	0.0475	4
Presentation & formats	1/2	1/3	4	1.00	0.1619	3

Maximum eigen value = 4.1810; C.I. = 0.060

Table 5.7: Pair-wise comparison with respect to the Task related factors

Factors	FVM complexity	Ambiguity	Managerial Bias	Audit fee	Relative weight	Rank
FVM Complexity	1.00	1/3	4	5	0.2844	2
Ambiguity	3	1.00	5	7	0.5534	1
Managerial Bias	1/4	1/5	1.00	2	0.1010	3
Audit fee	1/5	1/7	1/2	1.00	0.0611	4

Maximum eigen value = 4.1078; C.I. = 0.0359.

Table 5.8: Pair-wise comparison with respect to the Auditors specific factors

Factors	Cognitive Limitations	Skepticism	Knowledge and understanding	Valuation Specialist	Relative weight	Rank
Cognitive Limitations	1.00	1/4	1/7	1/6	0.0521	4
Skepticism	4	1.00	1/4	1/2	0.1530	3
Knowledge and understanding	7	4	1.00	3	0.5406	1
Valuation Specialist	6	2	1/3	1.00	0.2541	2

Maximum eigen value = 4.1164; C.I. = 0.0388.

Step 6: Global Weight Calculation

Next step is to determine the global weight or global priority for each criteria or sub-criteria in the hierarchy. The global weight of criteria represents the overall score of that criterion, and this score indicates the relative importance of each criteria or sub-criteria with compared to others. First, we calculated the local weight with the corresponding hierarchy level and global weight with respect to the top most level of hierarchy is calculated. Afterwards, global weights or relative weight of each factors corresponding to the main goal of the hierarchy is calculated (refer to table 5.9). The global weight can be calculated by following formula:

Global weights= (Local weight for criterion i * local weight for sub criterion j with respect to criterion i)

Table 5.9: Relative and Global ranking

Factors	Relative weight	Factor specific	Relative weight	Relative Rank	Global weights	Global rank
Environment	0.3202	Estimation Uncertainty	0.2135	2	0.0683	4
		Regulators	0.5770	1	0.1847	2
		Audit firm relationship...	0.0475	4	0.0152	11
		Presentation & formats	0.1619	3	0.0518	7
Task	0.5571	FVM Complexity	0.2844	2	0.1584	3
		Standards Ambiguity	0.5534	1	0.3083	1
		Managerial Bias	0.1010	3	0.0562	6
		Audit fee	0.0611	4	0.0340	8
Auditors	0.1226	Cognitive Limitations	0.0521	4	0.0063	12
		Professional Skepticism	0.1530	3	0.0187	10
		Knowledge and understanding	0.5406	1	0.0662	5
		Valuation Specialist	0.2541	2	0.311	9

5.5 Sensitivity analysis for AHP results

As established above, the finding of AHP analysis heavily depends on Individual expert judgment power, which makes them highly sensitive towards variation in relative importance of factors and sub factors. Therefore, a sensitivity analysis with various weight (0.3, 0.4, 0.5…..0.7, 0.8, 0.9) is used to ascertain the robustness of the results and generalization of AHP outcome (Chang *et al*., 2007). Task-related factors was used (as they got highest ranking among three factors) to illustrate the effect of changes in weight on the level of ranking. As shown in Table 5.9 first rank is acquired by standard ambiguity at all the changes level except 0.3 and 0.4 changes. It can infer that standard ambiguity is the most crucial factor and need greater stakeholder (including manager and auditors) concentration. In overall changes, weight changes have minimum effect on rank 1 to 6 and 10 to 12.

Table 5.10: Sensitivity analysis

Factors	Original Ranking	0.1	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Standards ambiguity	1	1	2	2	1	1	1	1	1
Regulators	2	2	1	1	2	2	2	3	3
FVM complexity	3	3	5	3	3	3	3	2	2
Estimation uncertainty	4	4	3	4	4	4	4	5	5
Knowledge & understanding	5	5	4	5	5	5	5	6	6
Managerial Bias	6	7	8	8	7	7	6	4	4
Presentation & Format	7	6	6	6	6	6	7	7	7
Audit fee	8	9	11	10	9	9	8	8	8
Valuation Specialist	9	8	7	7	8	8	9	9	9
Skepticism	10	10	9	9	10	10	10	10	10
Audit firm relationship with others firms	11	11	10	11	11	11	11	11	11
Cognitive Limitations	12	12	12	12	12	12	12	12	12

5.6 Results and Discussion

This study used AHP-based hierarchical model to evaluate the auditor's FVM audit decision making process. The hierarchical model (Figure 5.1) divided into three level viz. i) goal of study (objective of problem), factors (FVM auditing factors classification as per Bonner (2008) framework) and the sub-factors (identified through literature review & expert suggestion). Using pairwise comparison for various factors and sub factors, local and global weights for all factors are calculated for hierarchical prioritization.

Task related factors with global weightage of 0.557 are most significant factors in FVM audit process. Further, environmental factors with 0.3202 weightage and auditors specific factors with 0.1226 weightage are second and third in global ranking. This reveals that despite increasing environmental and auditor specific challenges, factors that specifically associated with "fair value measurement" task is still the most important factor in fair value environment.

There are four sub-factors in First category, among them; standards ambiguity (0.3083) has the highest weightage. Bratten *et al*. (2013) and Doliya and Singh (2016) also highlighted standards ambiguity issue and find that in several fair value situations, adoption of appropriate standards is left entirely to managerial or auditors' discretion viz. FVM input classification (level 2 or level 3 adjustment) and goodwill impairment (application of AU328 or AU 342). It is critical that PCAOB and other regulatory authorities provide clear and detailed guidelines for FVM auditing related regulations.

The FVM Complexity (0.2844) is ordered second in ranking. It is widely acknowledged that subjective managerial assumptions, complicated valuation process and absence of structured path have heightened the overall complexity in FVM audit (Earley, 2012). Managerial Bias (0.1010) comes third in relative importance ranking. As discussed above, FVM calculations involve a high level of managerial involvement that may provide provides opportunity for managerial manipulation and biasness. High level of managerial bias in estimations leads to cognitive biases and limitations in FVM judgment process that reduce the quality of audit. Finally, Audit fee (0.0611) comes last in the list. Ettredge *et al*. (2014) find the audit fee is positively associated with inclusion of fair value measurement in overall audit.

Environment related factors (0.3202) include another four sub-factors and hold second place in ranking. Regulators (0.5770) attain first rank in this group and show the significance of regulatory structure in FVM audit. Regulators are responsible for designing and proper implementation of FVM auditing guidelines and standards that directly affects the audit quality of firms (Hughes and Tett, 2008). AHP analysis ranks Estimation Uncertainty (0.2135) third in ranking. Inherent estimation uncertainty is a major characteristic of FVM reporting system because of the very nature of the measurement methodology and process. This aspect has been highlighted regularly in the literature e.g. Cannon and Bedard, 2014; Bratten *et al.*,

2013; Griffin, 2014. Presentation & format (0.1619) placed third in AHP ranking. Various assumptions and high-level subjectivity negatively affects the information-oriented objective of financial statements. Further, PCAOB and FASB enforced large amount of additional disclosures that makes it very difficult for users to understand the real situation of company from its financial statements (Clor-proell *et al.*, 2014).The final factor under environmental factors was audit firm relationship with others firms (0.0475), which is very less discussed in academic research. However, many experts suggest that relationship with other auditing firm may affect directly (price competitiveness) or indirectly (struggle for labor) auditing capabilities of firm.

Auditor specific (0.1226) factors refer to individual specific factors that play a critical role in auditor's decision making. It came third in AHP ranking and includes four sub-factors for further analysis. Knowledge and understanding (0.5406) positions first among this group. PCAOB (2009) and IAASB (2011) both acknowledge the significance of auditor knowledge and expertise and endorse the technical competence and capability of all audit team members in FVM auditing. Following this, Valuation Specialist (0.2541) comes next in ranking. The contemporary FVM auditing practice is complex in nature that requires the expertise in economics and mathematics instead of accounting. This balance could be achieved through inclusion of third party or in-house valuation specialist in auditing team (Grifith *et. al.,* 2014, Glover *et al.,* 2014). Afterwards, Professional skepticism (0.1530) ranked third in ranking. Professional skepticism is an attitude, which includes a questioning mind and a critical assessment of audit evidence (AU230). PCAOB standards as well as academic research acknowledge the need of skepticism in FVM auditing and refer to it as fundamental for audit quality and the integrity of the audit process (PCAOB, 2007; McMillan & White, 1993; Nelson, 2009). Last, in the importance order list is Cognitive Limitations (0.05212). The accuracy of fair value measurement is constrained by cogitative limitation of managers and auditors. Moreover, sometime auditors stuck at their early beliefs (self- or management) and have tended to ignore the testing of managerial valuation with independent estimates (Griffith *et al*., 2012).

5.6 Summary

In this chapter, application of analytic hierarchy process (AHP) in FVM auditing process is described in detail. First Appropriate justification for choosing the AHP technique as a tool for auditors' decision making analysis with relevant literature explained in detail. Further, this chapter use Bonner (2008) framework for classification of pre-identified factors. Next, using factors and sub-factors AHP model is developed and evaluated. This modelling will help various stakeholders in the identification of most significant factors of FVM audit process. In the end, sensitivity analysis is used to check the robustness of the developed model. The next Chapter presents the application of ISM methodology for the interrelationship

CHAPTER 6

ESTABLISHMENT OF INTERRELATIONSHIP AMONG IDENTIFIED FACTORS

Preview

This chapter establishes an interrelationship structure among the various FVM audit factors and highlight most significant factors of FVM audit process. This chapter include development of Structural Self-interaction Matrix (SSIM), Adjacency Matrix, Initial reachability Matrix (IRM) and Final reachability Matrix (FRM) and MICMAC Analysis.

CHAPTER 6
ESTABLISHMENT OF INTERRELATIONSHIP AMONG IDENTIFIED FACTORS

6.1 Introduction

Fair value measurements (FVM) have now emerged as an integral part of accounting and auditing standards. Many countries across the globe have initiated FVM-based standards and others are in the process of their adoption. FVM inclusion resulted in the change of auditor's role from a conventional and mechanized attester of tangible evidence to the one that exercises an exceedingly judgmental function in a holistic assessment of substantiation of the values ascribed to be fair by the entity's management (Singh and Doliya, 2015).

The role of the auditor in the context of FVMs is also becoming judgmental, increasingly so with the introduction of a multiplicity of financial instruments and other financial products of immense variety and complexity, possessing features compatible with the goals and needs of a large segment of the community. The FVM audit process is, nevertheless, a tedious job for auditors, mainly because of the influence of numerous direct or indirect factors in the audit process and its outcome. This intricacy of the audit process calls for the interaction of several degrees of freedom and faculties that influence this quasi-judicial decision making.

With this backdrop, interpretive structural modeling (ISM) has been employed for studying and establishing the relationships among the factors in this chapter. Having set up the backdrop to the study in this Section, we proceed to justification for adopted methodology followed by review of select research on ISM related studies (Section 6.2 and 6.3). Afterwards, review the research methodology to be adopted for the purpose of this study (ISM & MICMAC) is discussed in Section 6.4. Section 6.5 sketches of the computations of the model along with actual data analysis to avoid digression from the mainstream. In Section 6.6, we summarize the results of and the output of the model and provide their implication in context of the study being undertaken.

6.2 Justification for ISM

The induction of fair value based measurements in the statute books has given rise to a host of complex auditing issues in the fair value accounting environment. Interrelationships among several key variables need to be examined on a scientific and consistent basis to enhance credibility of the auditor's role. It is in this context that ISM could play a prominent role as a technology that is adaptable for use in the accounting profession to facilitate rational, scientific and transparent decision- making in complex and multifaceted environments. The ISM methodology enables identification of the structure within a system. Such system may be mathematically represented by interaction matrices and graphs, intent structures, delta charts, signal flow graphs etc. The ISM, then, attempts to uncover the embedded object or system in this set of relationships, thereby facilitating its interpretation by systematic iterative application of graph theory. The output of ISM takes the form of a directed graph for the complex system in a given contextual relationship among a set of elements.

The strength of ISM is that it can lead to the generation of visible, well-defined models of complex systems out of unclear, poorly articulated mental representations. Such mental articulations are usually fed as input in a combination of words and digraphs that can be analyzed in the form of sets and relations, with the mathematics being hidden in a computer program. The cardinal worth of Interpretive Structural Modeling (ISM hereinafter) is that it facilitates group decision making by consensus through structured debate. The methodology takes cognizance of the viewpoints interests and perceptions of all the group participants and analyses them through a scientifically implanted screening mechanism.

Thus, for this study ISM methodology is identified as a best fit and many authors (Warfield, 1994; Austin and Burns, 1985; Thakkar *et al.*, 2007; Chandramowli *et al.*, 2011; Cagno *et al.*, 2014) have worked with ISM in different context. Hence the use and suitability of ISM for developing the linkages between various factors is justified for the present case. Table 6.1 shows the work of some of the key researcher and their contribution for ISM development and implementation

Table 6.1: Review of Select Research on Interpretive Structural Modeling

S.No	Authors	Area	Journal	Title	Finding
1	Mandal, and Deshmukh, 1994	Supply Chain Management	*International Journal of Operations & Production Management*	Vendor selection using interpretive structural modeling (ISM)	This study establish the interrelationship among different criteria of vendor selection process and find that "attitude and willingness for business" and "after sales service" are as important factors as quality, delivery and practice.
2	Dhochak and Sharma, 2015	Venture Capital	*Decision*	Using interpretive structural modeling in venture capitalists' decision-making process	This study establish the interrelationship among different factors of investment decision-making process and find that 'entrepreneur's experience' is base key factor of VCs investment decision- making process
3	Saxena *et al.*, 1992	Energy Conservation	*Systems Practice*	Hierarchy and Classification of Program Plan Elements Using Interpretive Structural Modeling: A Case Study of Energy	This study use a case study of energy conservation in the Indian cement industry to determine the hierarchy of program plan elements and to classify them in categories.

				Conservation in the Indian Cement Industry	
4	Valmohammadia and Dashti, 2016	E commerce	*Information & Management*	Using interpretive structural modeling and fuzzy analytical process to identify and prioritize the interactive barriers of e-commerce implementation	This Study use ISM to identify the barriers in E commerce and find that 'Lack of awareness regarding the nature and benefits of e-commerce and Lack of technical infrastructure' is most significant barrier in E Commerce.
5	Manoharan *et al.,* 2010	Performance Appraisal	*Performance Improvement*	Analyzing the interaction of performance appraisal factors using ISM	In this article, interpretive structural modeling is used to analyze interrelationships among performance appraisal factors to design and plan a Training program for employees.
6	Robert W. Hawthorne, 1975	Higher education	*Socio-Economic Planning Sciences*	On applications of interpretive structural modeling to higher education	In this article, interpretive structural modeling and unified program planning discuss the higher education planning and find that "Increase in

				program planning	financial base and sufficient financial funding" is essential for higher education program planning.
7	Khan and Rahman, 2015	Branding	*Journal of Retailing and Consumer Services*	Brand experience anatomy in retailing: An interpretive structural modeling approach	This study use interpretive structural modeling to explore the critical variables of retail brand experience and find that 'packaging and customer billing and order application form' are most significant factors of brad experience.
8	Wan *et al.,* 2010	Business Risk Management	*Technology and Investment*	Case Study on Business Risk Management for Software Outsourcing Service Provider with ISM	Author's discovered the causal relationships among the risk factors, and constructs corresponding risk structure model with Interpretive Structural Modeling. Five original risk factors are identified.
9	Bolaños *et al.,* 2005	Group decision Making	*Management Decision*	Using interpretive structural modelling in strategic	This study use interpretative structural modeling to improve group decision making through limiting the

				decision-making groups	conflict and increasing the shared knowledge in group decision making.
10	Trivedi *et al.*, 2015	Waste Management	International Journal of Disaster Risk Reduction	Analysis of key factors for waste management in humanitarian response: An interpretive structural modelling approach	This study use ISM to establish the interrelationship between critical factors of successful disaster waste management and find that 'geography & terrain and type of disaster and disaster community' are the most critical factors in waste management.

This brings us to the theme of the current chapter wherein we used the salient inputs and/or faculties that go into the audit process through empirical analysis, prioritization process and panel discussion and thereafter set about constructing the interrelationship grid between them using the algorithm of "Interpretative Structural Modeling (ISM hereinafter)"followed by an exercise in MICMAC analysis to classify the factors under different clusters based on their driving and dependence powers.

6.3 Introduction to ISM & MICMAC

ISM is an aid to scientific decision making. The technique makes use of some elementary notions of graph theory, in particular, that there exists a one-to-one mapping between a binary matrix and a graphical representation of a directed network (Warfield 1974). The inputs to the model are usually obtained either from a literature review or a panel of experts acting in conjunction while the output is a directed graph or network representation of the interactions of the identified key factors to the decision (Katiyar *et al.*, 2015). ISM takes the form of the following algorithm that in explained in next section

6.3.1 Identification of key factors (inputs):

The "key factors" to the decision are usually, but not necessarily, identified through a comprehensive literature review covering the substratum of the decision proposed to be analysed or the output of a panel discussion of experts has broad spectrum expertise over the relevant areas. Sometimes, an appropriate combination of both approaches is preferred for precision. The study sponsors need to be convinced about the veracity of the key factors. This is the primary step at which intelligence inputs about the problem get embedded into the methodology. As such, if there seems to be some conflicting views or opinions about certain key factors in either approach, both the literature review and expert panel brainstorming may be used in conjunction for resolving such ambiguities. For our study, twelve key factors that relate to audit of FVMs were identified through a comprehensive literature review and exploratory factors analysis (discussed in chapter four). Further, analytic hierarchy ranking has been established on pairwise comparison (discussed in chapter five). Among these factors, top ten factors has been selected for establishment of interrelationship among factors. Afterwards, two

brainstorming sessions including a panel of eight experts (comprising of two academicians, four accounting professionals engaged with audit firms and two engaged in senior management positions in finance and accounting in Indian corporate houses of repute) has been used to establish the interrelationship among identified factors. They key factors constitute the elements set, S. Details of the ten key factors, so identified, together with the relevant source literature are set in the following table 6.2:

Table 6.2 - Key Factors & Their Sources

S. No	Key Factor	Source & Relevant Literature
1	Valuation Specialists [VaSp]	Glover *et al.*, 2014; Griffith *et al.*, 2014; Joe *et al.*, 2014; Carpentier *et al.*, 2008, Brown *et al.*, 2014
2	Professional Skepticism [PrSk]	Rasso 2015; Backof *et al.*, 2014 , Glover and Prawitt 2014 , Nolder and Kadous 2014; Kang *et al.*, 2015
3	Audit Fees [AuFe]	Goncharov *et al.*,2014; Mohrmanns *et al.*, 2013; Ettredge *et al.*, 2014
4	Estimation Uncertainty [EsUn]	Cannon and Bedard 2014; Christensen *et al.*,2012; Bratten, Gaynor *et al.*, 2013, Griffin, 2014
5	Managerial Bias [MgBs]	Martin and Wilks 2006; Griffith *et al.*, 2015; PCAOB Inspection Report 2011,12.13.14, Singh and Doliya, 2015
6	Role of Regulators [RoRg]	Carmichael, 2004; Hughes and Tett, 2008; Glover *et al.*, 2014a; Church and Shefchik, 2011; PCAOB Inspection Reports 2011, 2012, 2013, 2014
7	Standards Ambiguity [StAb]	Christensen *et al.*, 2013; Holthausen and Watts, 2001; Bratten *et al.*, 2013
8	FVM Complexity [FCx]	Martin *et al.*, 2006; Cannon and Bedard, 2014; Bratten *et al.*, 2013
9	Knowledge and Understanding [K&U]	Martinet *et al.*, 2006; Lacroix *et al.*, 2012; Kumarasiri and Fisher 2011; Bratten *et al.*, 2013
10	Presentation & Format [Pr&Fr]	Maksymov *et al.*, 2012; Backof et al. 2014; Clor- Proell, *et al.*, 2014; Bell and Griffin, 2012

*All these ten variables have been discussed in previous Chapter four (Factor Analysis) in detail.

* The letters in the square brackets are abbreviations for the key factor to be used in discussion and conclusion for the sake of brevity.

To avoid any confusion arising out of ambiguities of interpretation, the precise contextual meaning of every key factor, its contextual meaning and relevance are elucidated below

6.3.2 Construction of structured self-interaction matrix (SSIM hereinafter):

Having identified the element set, our next step is to identify the contextual relation, say R. S & R form the complete building blocks for the ISM and are physically represented in a structured matrix called the SSIM. The contextual relation is an assertion of some form of association between the identified key factors S in a context that is relevant to the decision being studied e.g. influence, relate, equal, affect, concern and so on. Contextual relations between key factors are identified in a similar manner as are key factors identified or through brainstorming sessions. Importantly the nature of this contextual relationship does not affect the algebraic structure of the model and, as such, this model is capable of analysing a broad spectrum of contextual relationship. These contextual relationships may be portrayed on the SSIM using the following abbreviations e.g. V = *x*R*y*; A = *y*R*x*; X= *x*R*y* and *y*R*x*;O = *x*~~R~~*y* and *y*~~R~~*x* (Malone 1975).

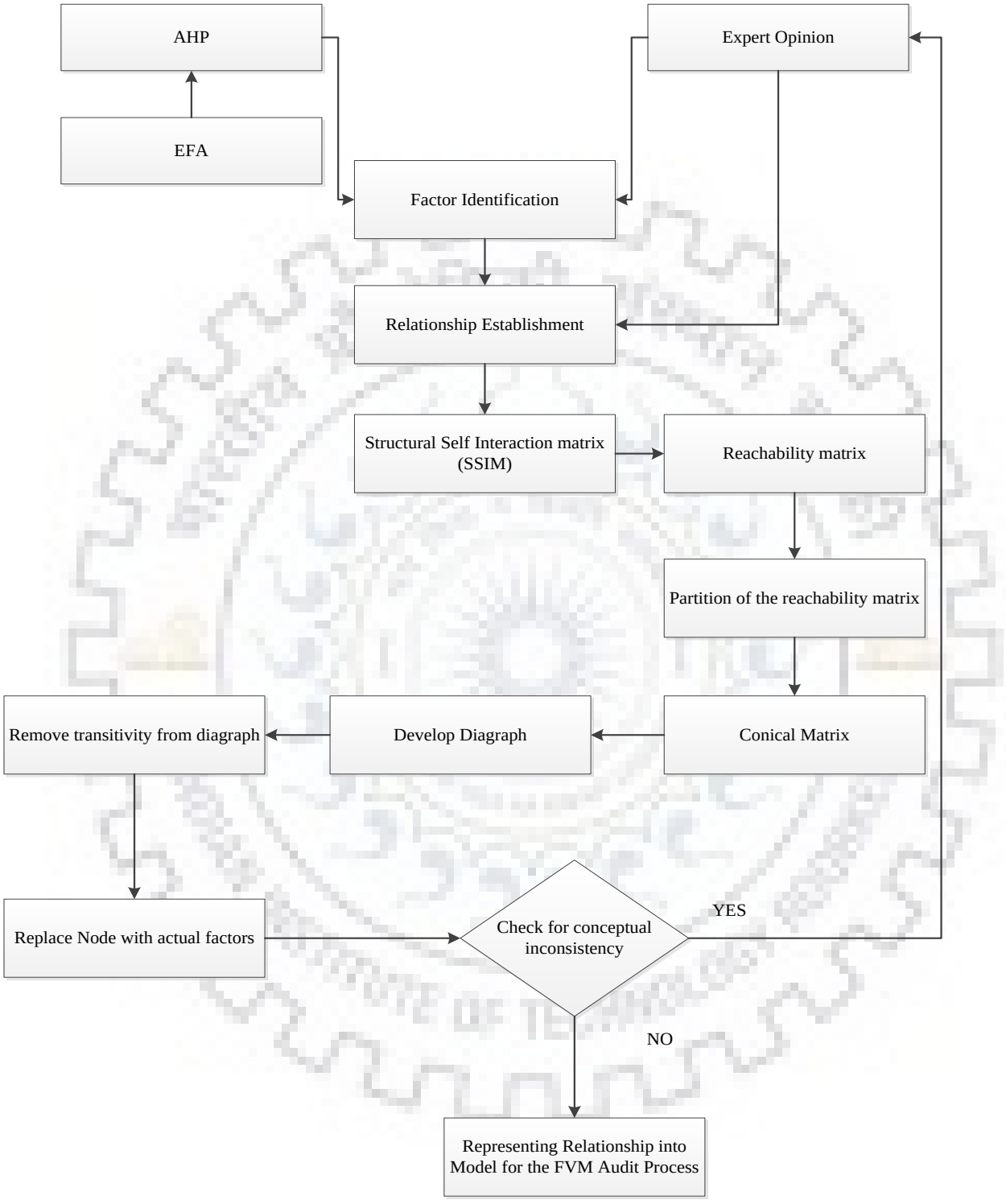

Figure 6.1: ISM Flow Diagram

We, now, set up the SSIM by setting the index set for the rows and columns of the matrix as the elements and the directed contextual relation between a pair of elements is indicated by using the letters V, A, X, O in the appropriate matrix cells e.g. if xRy = V, then cell (x,y) of SSIM will contain the letter V and so on.

Table 6.3: Structural Self-interaction Matrix (SSIM)

S. No.	FVM Audit Factors	10	9	8	7	6	5	4	3	2	1
1	Valuation Specialist	V	A	A	A	A	V	X	V	V	
2	Skepticism	O	A	A	A	A	V	A	V		
3	Audit Fees	A	A	A	A	A	A	A			
4	Estimation Uncertainty	V	A	A	A	A	V				
5	Managerial Bias	A	A	A	A	A					
6	Role of Regulators	V	O	V	V						
7	Standards ambiguity	V	V	V							
8	FVM Complexity	V	X								
9	Knowledge and understanding	V									
10	Procedures & Frames										

6.3.3 Construction of adjacency matrix (AM hereinafter):

This is, essentially, the binarization of the SSIM. We do so by the following rules:

Table 6.4: Rules for adjacency matrix construction

Cell (x,y) in SSIM	V	A	X	O
Cell (x,y) in AM	1	0	1	0
Cell (y,x) in AM	0	1	1	0

Table 6.5: Initial Reachability Matrix (IRM)

S. No.	FVM Audit Factors	1	2	3	4	5	6	7	8	9	10
1	Valuation Specialist	1	1	1	1	1	0	0	0	0	1
2	Skepticism	0	1	1	0	1	0	0	0	0	0
3	Audit Fees	0	0	1	0	0	0	0	0	0	0
4	Estimation Uncertainty	**1**	1	1	1	1	0	0	0	0	1
5	Managerial Bias	0	0	1	0	1	0	0	0	0	0
6	Role of Regulators	1	1	1	1	1	1	1	1	0	1
7	Standards ambiguity	1	1	1	1	1	0	1	1	1	1
8	FVM Complexity	1	1	1	1	1	0	0	1	0	1
9	Knowledge and understanding	1	1	1	1	1	0	0	1	1	1
10	Procedures & Frames	0	0	1	0	1	0	0	0	0	1

Thus, this matrix has the property that (x,y) =1 $\Leftrightarrow xRy$ and (x,y) =0 $\Leftrightarrow x\not{R}y$. However, the elements of this matrix may or may not obey transitivity i.e. xRy and $yRz \Rightarrow xRz$ which is vital for the success of this algorithm for, it is only then that we can achieve a hierarchical restructuring of the digraph (see below). Out next step is to accomplish this objective.

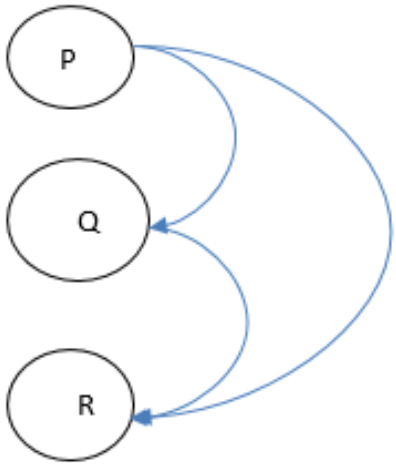

Figure 6.2: Concept of Transitivity

6.3.4 Construction of reachability matrix (RM hereinafter):

Mathematically, transitivity can be achieved by adding the identity matrix to the AM and then raising the resulting matrix to successive powers until no new entries are obtained. The salient property of this matrix is that contextual relation R could subsist either between a pair of elements s_i and s_j through an direct association or could also exist through a sequence of one or more intervening relations through transitivity if a path can be traced through these intervening elements from one to the other. In other words, s_j^{th} element would be contextually related to s_i^{th} element if a path, whether with or without any intervention, can be traced from the latter to the former. Further, an element is linked to itself by a path of length zero. In view of the above property, this matrix is also called RM. Equivalently, RM has the entries (i,j) = 1, if the s_j^{th} element is reachable from the s_i^{th} element and zero otherwise.

Table 6.6: Final Reachability Matrix (FRM)

S. No.	FVM Audit Factors	1	2	3	4	5	6	7	8	9	10	DRP
1	Valuation Specialist	1	1	1	1	1	0	0	0	0	1	**6**
2	Skepticism	0	1	1	0	1	0	0	0	0	0	**3**
3	Audit Fees	0	0	1	0	0	0	0	0	0	0	**1**
4	Estimation Uncertainty	1	1	1	1	1	0	0	0	0	1	**6**
5	Managerial Bias	0	0	1	0	1	0	0	0	0	0	**2**
6	Role of Regulators	1	1	1	1	1	1	1	1	1*	1	**10**
7	Standards ambiguity	1	1	1	1	1	0	1	1	1	1	**9**
8	FVM Complexity	1	1	1	1	1	0	0	1	0	1	**7**
9	Knowledge and understanding	1	1	1	1	1	0	0	1	1	1	**8**
10	Procedures & Frames	0	0	1	0	1	0	0	0	0	1	**3**
FRM		**6**	**7**	**10**	**6**	**9**	**1**	**2**	**4**	**3**	**7**	**DEP**

*shows transitivity

6.3.5 Construction of reachability set & antecedent set (RS, AS hereinafter):

The reachability set V_i corresponding to an element s_i consists of all elements that are reachable from s_i. In the RM, they are those elements representing those columns that contain the entry 1 in the i^{th} row. Similarly, we can define an antecedent set W_i of an element s_i as consisting of those elements that can reach s_i. These elements correspond to the unit row entries in i^{th} column of the RM.

Table 6.7: Partition of Reachability Matrix

Measures	Reachability Set	Antecedents Set	Intersection set	Level
1	1,2,3,4,5,10	1,4,6,7,8,9	1,4	
2	2,3,5	1,2,4,6,7,8,9	2	
3	3	1,2,3,4,5,6,7,8,9,10	3	**I**
4	1,2,3,4,5,10	1,4,6,7,8,9	1,4	
5	3,5	1,2,4,5,6,7,8,9,10	5	
6	1,2,3,4,5,6,7,8,9,10	6	6	
7	1,2,3,4,5,7,8,9,10	6,7	7	
8	1,2,3,4,5,8,10	6,7,8,9	8	
9	1,2,3,4,5,8,9,10	6,7,9	9	
10	3,5,10	1,6,7,8,9,10	10	

Table 6.8: Level Partition cont...

Iteration	Reachability set	Antecedent set	Intersecting sets	Measures	Level
II	5	1,2,4,5,6,7,8,9,10	5	**5**	**II**
III	2	1,2,4,6,7,8,9	2	**2**	**III**
III	10	1,6,7,8,9,10	10	**10**	**III**
IV	1,4	1,4,6,7,8,9	1,4	**4**	**IV**
V	1,4	14,6,7,8,9	1,4	**1**	**IV**
VI	8	6,7,8,9	8	**8**	**V**
VII	9	6,7,9	9	**9**	**VI**
VIII	7	6,7	7	**7**	**VII**
IX	6	6	6	**6**	**VIII**

6.3.6 Identification of bottom level elements and partitioning of S by iteration:

Those elements for which the antecedent set is a subset of the reachability set are identified as the bottom level elements. The row and column corresponding to these elements are removed from the RM and the above process iterated to generate a second bottom level set of elements and in this way, a partition of the set S that leads to hierarchical restructuring of the digraph is achieved.

Table 6.9: Conical Matrix

Measures	3	5	2	10	4	1	8	9	7	6	Driving power
3	1	0	0	0	0	0	0	0	0	0	**1**
5	1	1	0	0	0	0	0	0	0	0	**2**
2	1	1	1	1	0	0	0	0	0	0	**4**
10	1	1	1	1	0	0	0	0	0	0	**4**
4	1	1	1	1	1	1	0	0	0	0	**6**
1	1	1	1	1	1	1	0	0	0	0	**6**
8	1	1	1	1	1	1	1	0	0	0	**7**
9	1	1	1	1	1	1	1	1	0	0	**8**
7	1	1	1	1	1	1	1	1	1	0	**9**
6	1	1	1	1	1	1	1	1	1	1	**10**
Dependence	**10**	**9**	**8**	**8**	**6**	**6**	**4**	**3**	**2**	**1**	

6.4 The MICMAC Procedure

The MICMAC procedure aims at clustering the similar key factors into clusters while taking account of their hierarchical structure obtained through ISM (Duperrin and Godet 1973; Shankar Chandramowli, Transue, Felder 2011; Ali & Govindan 2011). For this purpose, a conical matrix (CM hereinafter) is constructed by summing the number of unit entries in the rows and columns respectively. The number of units in the i^{th} row defines the drive power of the factor s_i. Similarly, the aggregate of unit entries in the j^{th} column give the dependence power of the j^{th} element. This is followed by preparing a ranking structure based on drive power and dependence power on

the basis of the descending number of unit entries in rows and columns respectively obtained above.

6.5 Construction of the digraph

A digraph is a pictorial representation of the elements and the interdependencies as defined by the contextual relation. It is prepared from the CM while taking account of the hierarchical structure obtained through ISM and the clustering achieved by MICMAC. Thus, the top level factor is positioned at the top of the digraph and second level factor is placed at second position and so on, until the bottom level is placed at the lowest position.

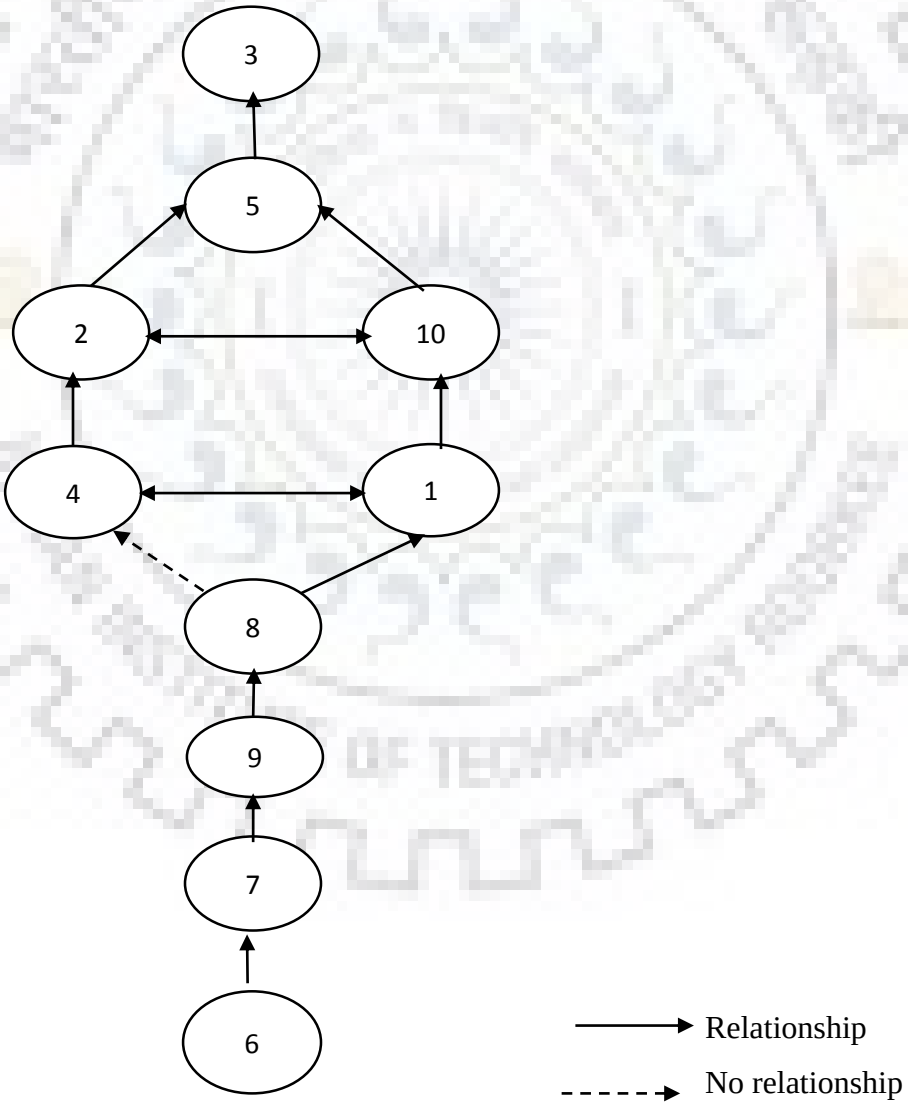

Figure 6.3: ISM Diagraph shows the levels of factors

6.6 Development of digraph and ISM based Model

Full representations of the various matrices and digraphs involved in the model development are placed in the Appendix. An Initial diagraph that includes transitivity links is prepared on the bases of the CM. Arrows in the digraphs indicate interrelationships from the tail key factor to the head factor. Final diagraph is completed after removing all the indirect relationships between the factors and placing all the factors on the hierarchy as per their levels. Thereafter, the digraph is converted into ISM model and all its nodes are replaced by actual statements.

6.7 Results & Inferences

The ISM output shows that RoRg and StAb are the most significant of the ten identified key factors that have been input to the model as they are placed at the bottom. AuFe on which cost efficiency of FVM audit depends appeared at the top of the hierarchy. K&U affects FCx that plays a vital role in determining the requirement of VaSp. High level of complexity and low level of knowledge enhances the need of VaSp in the FVM audit process. VaSp and EsUn mutually affect each other, as regular and judicious use of VaSp helps in reducing the EsUn in FVM audits. Further high EsUn elevates the level of PrSk used by auditors. Similarly, Pr&Fr also affects the level of PrSk in financial statements. The digraph shows that PrSk and Pr&Fr are mutually interrelated to each other. Both of these factors collectively influence the level of MgBs in financial statements as skepticism and framing can enhance the opportunity for MgBs in financial statements. Contrary to literature (Cannon and Bedard 2014), ISM indicated no direct relationship between EsUn and FCx reflecting the views of the panel that it was the intrinsic nature of the FVM and the management inputs with regard their to that led to complexity rather than explicit uncertainties in estimations.

Dependence and driving powers are calculated for various input key factors by using MICMAC analysis. Some key findings emanating from this analysis include that (i) RoRg and StAb exhibit highest driving power and low dependence power. Interestingly, the same two key factors appeared at the bottom of the ISM hierarchy; (ii) FCx, K&U have strong driving power and relatively less dependence power. (iii) AuFe, MgBs, PrSk and Pr&Fr are factors with low driving powers but they have strong dependence on standard ambiguity, RoRg, FCx and K&U;

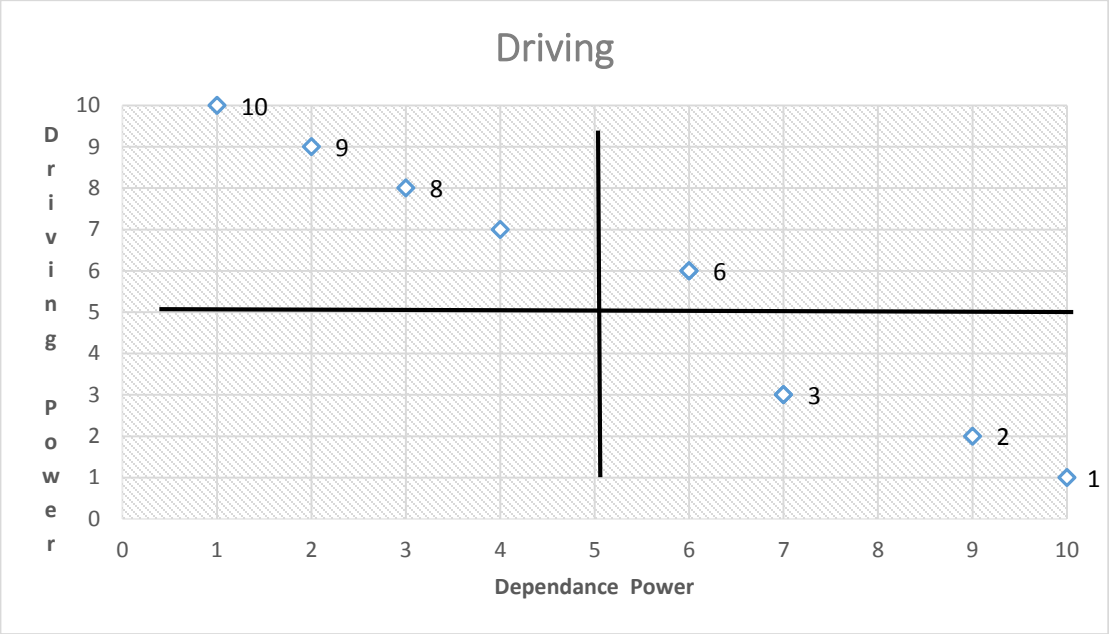

Figure 6.4 Driving and dependence power diagram

The final MICMAC output evidences that there are two linkage key factors viz. EsUn and VaSp. For this purpose, a "linkage factor" connects the driving key factors with the dependent key factors and represents the level of instability in the hierarchy. Besides, there are no autonomous factors in driver-dependence diagram, so that every factor has some kind of effect on FVM audit process. The MICMAC analysis implies that RoRg, StAb, FCx, K&U require special focus from auditors and management.

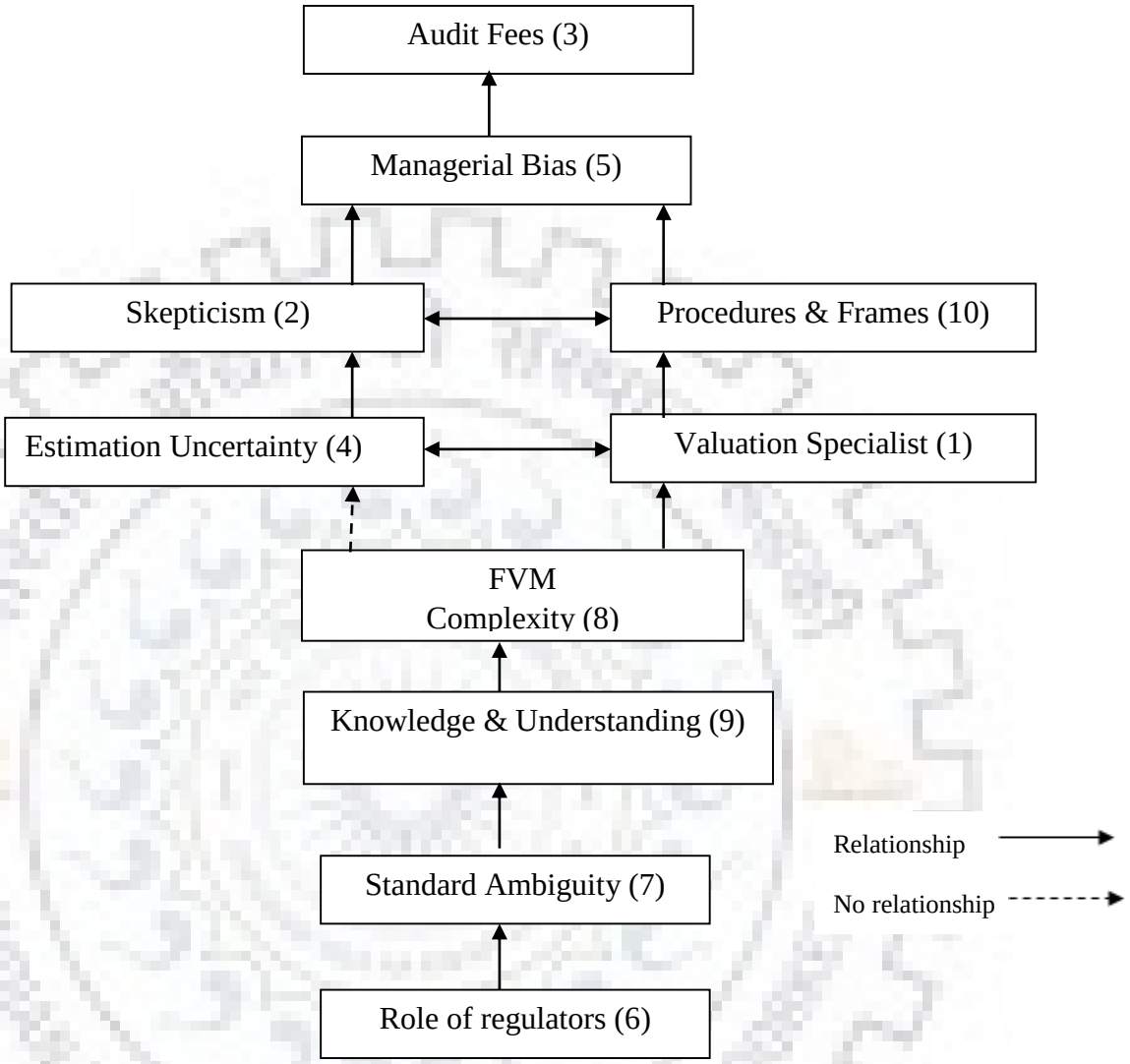

Figure 6.5: ISM-based model for the FVM Auditing Process

CHAPTER 7

SUMMARY, CONCLUSION AND IMPLICATIONS

Preview

This chapter provides a summary of the study along with major findings and their implications in various fields. It also presents the limitations of the study and discusses the possible areas of future research.

CHAPTER 7

SUMMARY, CONCLUSION AND IMPLICATIONS

7.1 Introduction

This chapter presents a summary of major findings, and discusses the implications, limitations of this thesis and scope for future research. This study is primarily motivated by the fact that fair value measurement has taken place a center stage in contemporary financial reporting scenario and majority of stakeholders are still not able to adjust with current FVM practices especially auditing of FVM.

Therefore, the research comes in hand by undertaking exploratory perspective covered a wide range of issued for comprehensively analyzing FVM audit process. This study aim towards improving the auditors' decision-making process in FVM auditing and addressed the following research objectives in course:

1. To identify the various factors relevant in contemporary fair value auditing.
2. To prioritize the factors so identified on a scientific basis for an efficient auditors' decision-making in fair value environment.
3. To establish various interrelationship between the factors identified above on a scientific basics.
4. To facilitate a scientific and holistic presentation of fair value auditing attributes for auditors engaged in fair value auditing, as well as for standard setters and regulators.

With the exploration of these research issues, this study provides empirical evidence on FVM audit process with focus on enhancement of literature on related filed and understanding the perception of various stakeholders on auditors' decision-making process in FVM auditing. Therefore, a comprehensive literature review and relevant data has been collected from numerous respondents, which further analyzed through various statistical and modeling techniques. Finally, findings are documented along with the recommendations using an integrated approach.

The present study followed a systematic approach and research analysis can be divided into two sections:

1. First section of our research deals with the identification and extraction of key variable (based on comprehensive literature review & questioner research) in FVM audit process. Exploratory Factor Analysis (EFA) including principal component analysis (PCA) with Varimax factor rotation method was used to identify and explore significant factors in the FVM audit process. Questionnaire development process and findings of factors analysis are discussed in chapter 3 and 4 respectively.
2. Second section of our research deals with the analytical modeling analysis to get deep insights on auditors' decision making process in FVM auditing attempt to suggest conceptual decision making framework for various stakeholders' perspectives. Analytical Hierarchy Process (AHP) and Interpretive Structural Modeling (ISM) have been used to address hierarchical and interrelationship issue. Results and findings of each modeling approach are discussed in detail in respective Chapters 5 and 6.

7.2 Summary

Chapter One examines the theoretical underpinnings of Fair Value Measurement to unravel basic need and significance of fair value in contemporary auditing scenario. It discuss the measurement approaches (income, cost and market) and different level of FVM hierarchy. Next, research question, research objectives, scope of studies and thesis of structure is discussed.

Chapter Two discovers how the global accounting convergence process has placed fair value measurement at the forefront of the international arena, and driven reforms and development of the auditing regulatory framework. A comprehensive literature review of 50 most relevant articles has been carried out to analyze lacunae in auditing fair value measurement emanated in the recent IFRS adoption to understand reactive approach to subsequent FVM auditing regulation. This chapter found several gap in existing literature less literature in FVM auditing, No study towards understanding of fair value, lack a degree of clarity about FVM audit factors in auditors' decision making process etc.

Chapter Three includes a detailed description of the research methodology used for achieving the above-mentioned objectives. It informs about the sampling frame of the study, questionnaire development of the study, reliability and validity assessment of the questionnaires and brief description of data analysis strategies (Exploratory Factor Analysis, Analytic Hierarchy Process, Interpretative Structure Modeling) used in present study.

Chapter Four is empirical in nature and consists of the analysis carried out for the study. It includes Exploratory Factor Analysis (EFA) including principal component analysis (PCA) with Varimax factor rotation for identification of various FVM audit process factors based on different stakeholder response. This chapter includes pilot study of pre-identified factors and factors analysis process, which resulted in thirty nine statement related to twelve key factors of FVM audit process.

Chapter Five discuss application of AHP in FVM auditing and develop a hierarchical ranking of critical factors in auditors' decision making process in FVM auditing. This chapter use Bonner (2008) framework and classify identified factors under Task related, Environmental and Auditors specific factors. It was found that Task related factors are most significant factors in FVM audit process and environmental and auditors' specific factors are ranked second and third respectively in global ranking. Further, it was also found that 'Standard Ambiguity' is the most important in task related factors, 'Regulators' is most important under environment factors and Knowledge and understanding is highest important under auditor specific factors. In the end, the robustness of model is checked with change in task related factors of ranking.

Chapter Six establishes an interrelationship structure among the various FVM audit factors and highlight most significant factors of FVM audit process. This chapter include development of Structural Self-interaction Matrix (SSIM), Adjacency Matrix, Initial reachability Matrix (IRM) and Final reachability Matrix (FRM) and MICMAC Analysis. It was revels that regulators and standard ambiguity has the highest driving power and Fair value

Complexity and Knowledge and Understanding have strong driving power and relatively less dependence power

Present chapter (seven) concludes the thesis with a discussion of results, implications, assumptions and limitations, and provides directions for further study.

7.3 Implications of the study

This study examines the auditing of fair value measurement from in an entirely new manner. This study performs an empirical evaluation of the factors affecting auditor's decision making in fair value auditing. In addition, the present study prioritizes and establish the significant FVM audit factors from multi stakeholder's perspective. Thus, this study brings forth a number of interesting results and novel insights into the contemporary FVM audit practice. The findings of the present study have numerous practical implications for various stakeholders in the industry primarily, Big 4 Regulators, Non-Big 4 regulators, academia and standard setters.

1. The study clearly demonstrated that in spite of great recognitions by numerous authors about the significance of the subject, the area of "Fair Value Measurement" is not well researched and relatively less number of papers is available. The majority of FVM studies on capital market perspective of fair value. There is still a need to go beyond the emphasis on value relevance and information relevance in FVM literature. This study attempts to bridge this gap and extended the FVM auditing literature.

2. The earlier FVM auditing literature primarily based on the cases resulting from various challenges in FVM auditing; as a result they suggested varied factors for FVM audit process. It is seen that subject has not viewed from holistic approach. Therefore, this study consider FVM audit as a wholesome process and include multi stakeholder perspective in attempt to explore the subject with an integrating perspective.

3. Analysis of literature shows that developed countries have contributed more towards FVM auditing research, very rare studies are seen from developing countries that specifically focused on FVM auditing.

4. This study, despite the methodological and objective difference among the existing literature highlights the systematic gaps on the various themes of existing literature. These gaps definitely help researchers to choose the appropriate tools and techniques and apply the same in their context

5. This study use exploratory factors analysis to determine twelve critical factors of FVM audit process viz. i) Estimation Uncertainty, (ii) Regulators, (iii) Audit firm's relationship with other firms, (iv) Presentation and Formats, (v) FVM complexity, (vi) Standards Ambiguity, (vii) Managerial Bias, (viii) Audit Fee, (ix) Cognitive Limitations, (x) Professional Skepticism, (xi) Knowledge and Understanding and (xii) Valuation Specialists.

6. The results offer a new set of research direction for FVM auditing literature. It also identifies various FVM auditing factors on the basis of primary data which had not been recognized in literature earlier as influencers of auditors' decision making in FVM audit. Thus, academics would now have a new set of factors that could be tested in various other contexts and different combinations to better understand the decision making process of auditors' in complex accounting estimates.

7. This study introduce the application of analytic hierarchy process in fair value auditing and become first study that use any MCDM technique to improved auditors' decision making in complex FVM environment. The prioritization of factors through numeric weightage may help auditors in determining the impact ratio of factors in FVM auditing process. Although factors with high weightage required additional efforts from auditors, but complete overlook of low weightage factors is also not advised as ranking may change in different economic context

8. Analyzing the inter-relationship among FVM audit decision making factors helped user determine driving and dependency of the factors. Future researchers may further build upon this study and develop a new model for effective and informed audit decision making.

9. The study provides a better understanding of the auditors' decision making process in FVM auditing process by focusing on holistic assessment of auditors' decision making of FVM audit process and can be used by manager for better understanding of FVM auditing process that may help in to formulate strategies to coordinate their assumption and modeling with auditors.

10. The study provides a basis to Big 4 and Non-Big4 auditors' to assess their FVM audit decision making process by identifying and ranking key factors. Auditors' could use this list of factors as a guideline before audit decision or can use finding of this study to find anomalies in their existing FVM audit process and take corrective actions against them.

11. Regulatory bodies like the PCAOB and Financial Accounting Standards Board can use these findings to restructure the existing FVM auditing framework, upgrade existing standards, and formulate new ones on various aspects of auditing in a fair value environment.

7.4 Recommendations/Suggestions of the study

Based on the results and analysis of the study, some recommendations and suggestions have been made to improve the overall process of auditors' decision-making in FVM audit.

1. This study implicated that auditing fair value measurement is still evolving and going through a transitional phase. While efforts have been made to improve FVM audit procedure through additional disclosure, pronouncement of the new FVM auditing standard is a big step in this direction. But, this needs to be carried forward as FVM auditing is ever evolving process. The recommendations of the study can have implications and applicability in framing some of the rules to increase FVM audit quality. It is implied from the study that consistent efforts are required on the part of standard setters, auditors, and others to continue reforms to achieve an attainable effective level.

2. To overcome FVM auditing challenges, this study advocate for combined efforts from different regulatory, tax and legal bodies whether supervision level or at standards formation level. FVM auditing required a different set of knowledge (economics, mathematics modeling) and training (advance data analytics) compare to general audit (accounting and auditing). To enhance the awareness and technical knowledge related to auditing of fair value, constant changes are required in the pedagogy of professional accounting bodies imparting accounting and auditing education.

3. To enhance FVM audit quality, we recommend inclusion of experienced and experts' auditors for FVM auditing. It is complex job, which requires a different set of knowledge compare to general auditing therefore, inclusion of valuation specialist need to make mandatory in FVM audit team. Further, to enhance the understanding at managerial level, constant training and hand on work training program need to be organized at managerial level.

4. Managers should be supportive of the work of auditors' rather than taking a confrontation attitude in view of the complex nature of auditing fair value measurement. Management should provide the auditors will all the grass root data and other input used by him in its estimation process.

7.5 Limitations of the Study

The present study has certain limitations which may arise due to the scope, methodology and tools and techniques used in the analysis. The limitations of the study are as follows:

1. In pursuing this study, limitation and constraints in terms of financial resources and time cannot be overemphasized. Though he received institutional support which is critical and important for this kind of research, but it is also by and large limited. The researcher faced practical problem in approaching a large number of respondents and convincing them to give their feedback on the critical factors of FVM auditing.

2. As FVM auditing is still at nascent stage, still no model or theory was available (for some factors) that could be applied to the measurement items considered. Hence, EFA was preferred over CFA.

3. The present study is subject to some methodological challenges. The research has been mainly administered and analyzed through questionnaire survey. It should be recognized that this method has its own inherent weaknesses and limitations like social desirability issue, respondent's bias, measurement error, etc. may exist. Furthermore, it is probable that some statements presented in the questionnaire could have lacked in clarity resulting in the fact respondents could have perceived them differently.

4. Although this study used empirical analysis and include several factors influencing auditors' decision making in FVM auditing but there may be other factors that have not been taken into account. Furthermore, penalized brainstorming sessions of experts was used to prioritization of factors and establishment the interrelationship between key factors. Thus, the carrying of personal perceptions and biases into the shortlisting cannot be ruled out.

Considering the limitations of the study, future research may look to adopt techniques and approaches that may overcome such limitations.

7.6 Future research

This is probably one of the first academic studies to examine and analyze the auditing fair value measurement as wholesome process from following the recent fair value based IFRS adoption around the globe (Goel, 2013).The scope and limitations of the study render opportunities and give directions to carry further research:

1. This study established on Indian stakeholder response. A future refinement of this work research may consider respondent from other countries while taking into account different samples, respondents and research designs. The results thus obtained may be compared with the findings of this study to examine the differences and the reasons thereof.

2. Future research can compare the different stakeholders' or cross country perception of different stakeholders on various FVM audit factors.

3. Further research may be carried out to understand the moderating and mediating role of different FVM audit factors on overall audit quality. Such as moderating role valuation specialist between FVM complexity and audit quality or mediating role of skepticism between estimation uncertainty and audit quality.

4. This is one of the first studies which used modeling technique for FVM auditing. This work can further enhanced by validating the proposed model with the help of structural equation modeling (SEM Moreover, AHP methodology itself suffer from several weaknesses including vagueness, uncertainty and bias. To remove these issues, some other decision making tool (Fuzzy, Dematel, Electre and Vikor) can be combined with AHP to improve decision making quality.

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Annexure – 1
Cover Letter

DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE-247667

REQUEST FOR PARTICIPATION IN SURVEY

May 15, 2015

Dear Professional Colleague

Mr. Prince Doliya the bearer of this letter is a Doctoral student of the Department of Management Studies at Indian Institute of Technology (IIT) Roorkee working towards his PhD degree under my supervision. His area of research is "Fair Value Based Auditing". As you will kindly appreciate, with the adoption of IND-AS accounting standards in lndia, FVM has important ramifications for the country's accounting fraternity. The current work is expected to contribute in this direction.

1 shall be much obliged if you will please take a few minutes off your busy schedule and help Mr. Doliya by providing your invaluable inputs that, 1 am ·sure, are seasoned with years of expertise and experience.

I also hereby assure you that the collected responses would be kept confidential and used only for academic purposes.

Thanks so very much indeed & best regards

Prof. J P Singh
Department of Management Studies
Indian Institute of Technology (IIT) Roorkee
Uttarakhand (India)

Annexure – 2

`QUESTIONNAIRE ON AUDITING OF FAIR VALUE MEASUREMENTs (FVM)

This questionnaire is part of my PhD thesis entitled "**ANALYZING FAIR VALUE AUDITING IN CONTEMPORARY FINANCIAL REPORTING SCENARIO".** The primary objective of this questionnaire is to analyze the current FVM auditing practices. The study focuses on fair value accounting as a whole with special reference on FVM auditing.

I assure you that information collected through this questionnaire will be kept confidential and used solely for academic research. While filling the questionnaire, if you encounter any problem, please contact me at princddm@iitr.ac.in or doliya.prince@gmail.com or at Mobile No. +919720514765.

Section 1: Personal Information:

Name _____

Mailing Address _____

Organization _____

Designation _____

Experience (years) _____

S. No	Statement	1	2	3	4	5
1	There are not adequate guidelines/standards for estimating fair values in complex situations	1	2	3	4	5
2	Some fundamental changes are required at regulator level for proper implementation of fair value based accounting and auditing standards	1	2	3	4	5
3	Focused training on FVM is required as part of professional training for an effective fair value audit.	1	2	3	4	5
4	Regulators need to enforce strict penalty law for successful FVM implementations.	1	2	3	4	5
5	Advisory facilities should be made available to the accounting and auditing fraternity by the regulators on ambiguous and equivocal issues.	1	2	3	4	5
6	Role of an independent supervisory outfit on the lines of PCAOB (USA) needs to be set up in India like developed economies for audit supervision.	1	2	3	4	5
7	Auditors task becomes more difficult due to inherent estimation uncertainty of FVMs.	1	2	3	4	5
8	The verifiability of FVMs is difficult due to the lack of supporting tangible evidence.	1	2	3	4	5
9	Estimation uncertainty is one of the most important limitations to the successful adoption of fair value based accounting	1	2	3	4	5
10	Many developing economies does not have ample depth in their market to provide reliable FVM input.	1	2	3	4	5
11	Fair valuation based on subjective assumptions makes it difficult to audit.	1	2	3	4	5

12	FVM auditing standards provide high level of opportunity for exercise of auditors' discretion.	1	2	3	4	5
13	Fair value measurement standards do not provide clear direction for fair value input classification.	1	2	3	4	5
14	Many FVM valuation and auditing standards are ambiguous in nature.	1	2	3	4	5
15	Some standards are necessary ambiguous because of the intrinsic nature of underlying accounting process.	1	2	3	4	5
16	Fair value based standards suffer from ambiguity because fair value accounting is still in a nascent state of evolution.	1	2	3	4	5
17	Extra knowledge and on hand FVM training can remove standards ambiguity	1	2	3	4	5
18	Financial Statements based on FVA are too complex for the understanding of layman investor	1	2	3	4	5
19	Current practices related to ascertainment of fair values usually based on managerial estimation which enhance the complexity of audit process.	1	2	3	4	5
20	Providing information on fair value in addition to cost value sometime makes the financial statement difficult to understand.	1	2	3	4	5
21	Additional disclosure and guidelines can completely can ease the complex valuation process.	1	2	3	4	5
22	The present FVM strategy provides opportunities for managerial manipulation	1	2	3	4	5
23	Management prefers to classify ambiguous input cases into level 2 input more than level.	1	2	3	4	5
24	Auditors are adequately conversant with the FVM standards prescribed by the regulators.	1	2	3	4	5

25	FVM auditing require expertise understanding of economics and mathematics instead of accounting & auditing	1	2	3	4	5
26	Advance knowledge & training on data analytics will increase quality of FVM auditing	1	2	3	4	5
27	Valuation specialist play a valuable role in the overall scheme of audit of FVMs	1	2	3	4	5
28	Valuation specialists are mostly required for level 2 and level 3 inputs as compared to level 1.	1	2	3	4	5
29	The job role of a valuation specialist requires a different set of knowledge and training skills from that of the accountant/auditor	1	2	3	4	5
30	Valuation specialist negatively affect the organizational culture	1	2	3	4	5
31	Skepticism is a critical factors in FVM auditing and level of skepticism used is positively correlated with different hierarchy level	1	2	3	4	5
32	Auditor skepticism is affected by the ambiguities and complexities of auditing standards	1	2	3	4	5
33	FVM auditing process needs a judgment framework and skepticism continuum	1	2	3	4	5
34	Preciseness among auditing standards has a positive relationship with the application of professional skepticism.	1	2	3	4	5
35	Fair value based measurement comprise high level of subjectivity and uncertainty that negativity affect the readability of financial statements	1	2	3	4	5
36	Extra disclosures for fair values in respect of assets and liabilities that are reported at historical cost will add useful informational value to the financial statements	1	2	3	4	5

37	Additional disclosures could be stipulated by standard setters to help stakeholders in understanding fair value in financial statements	1	2	3	4	5
38	There is positive association between audit fee and different levels of FVM inputs.	1	2	3	4	5
39	The increase in audit cost is compensated by improvement in quality of financial reporting under FVM	1	2	3	4	5
40	The accuracy of fair value measurement are constrain by cogitative limitation of managers and auditors'	1	2	3	4	5
41	Psychological heuristics and biases have a more significant effect on Fair value auditing compare to conventional audit	1	2	3	4	5
42	The Relationship between members of different audit firm affect their auditing process	1	2	3	4	5
43	The market dynamics between various audit firms are significant contributor to the standard setting process	1	2	3	4	5
44	Audit firm reputations play a major role in auditors' decision making process	1	2	3	4	5
45	There is positive association between FVM audit quality and Audit firm reputations	1	2	3	4	5

You may please give any further suggestions that may be useful to understand the FVM audit process in India. Your experience and observation will be very useful and helpful to complete my research work qualitatively. Thanks for your support and sparing some moments from your busy schedule.

Annexure – 3

List of Publications

PUBLICATIONS & CONFERENCES

- Doliya, P. and Singh, J.P. (2016).An ISM approach to analyze the interaction among factors of FVM audit process, JETA, American Accounting Association

- Doliya, P. and Singh, J.P (2015). On the Implications of Fair Value Based Merger Accounting. Procedia - Social and Behavioral Sciences, Elsevier, 189 (2015) 356 – 361

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- Doliya, P. and Singh, J.P. (2015). Analysing the Fair Value Measurement audit process using Interpretive Structural Modeling - An empirical evidence, Inderscience publications,

- Doliya, P. and Singh, J.P. (2016). Auditing Fair Value Measurement: A Developing Country Evidence, ICFMCF, Full Paper on Indian Institute of Technology Madras, August 12th 2016

- Doliya, P. and Singh, J.P. (2016). The Curious Case of Pension Accounting, Full Paper on NIDA International Business Conference 2016 Conferences Proceedings ((ISBN 978-974-231-893-2), NIDA Business School, Bangkok, Thailand, March 12th 2016

- Doliya, P. and Singh, J.P. (2016). Accounting for Post-Retirement Benefit: A Case study approach. MDC & VRS 2016, VGSOM IIT Kharagpur

- Doliya, P. and Singh, J.P. (2015). Fair Value Measurement and Accounting: An auditor's perspective. Full Paper on CD (ISBN No. 978-81-929149-2-3.) of Global Conference on Managing in Recovering Markets, MDI Gurgaon, March 11th - 13th, 2015

- Doliya, P. and Singh, J.P. (2015). On the Implications of Fair Value Based Merger Accounting. Full Paper on CD (ISBN. 9789384935023) of the proceedings of SOM 2014, Department of Management Studies, IIT Roorkee, December 12th -14th, 2014, pp. 613-617.

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ICRBS 2015, Department of Management Studies, IIT Roorkee & Sheffield Business School UK, December 4 -6, 2015.

UNDER REVIEW

- Doliya, P. and Singh, J.P. (2015). Auditing Fair Value Measurements: A Systematic Review and Meta-Synthesis

- Doliya, P. and Singh, J.P. (2016). Identification and prioritization of FVM audit factors using analytical hierarchy process. (Under Review)

- Doliya, P. and Singh, J.P. (2016). Demonstrating the Implication of IAS 19 in Contemporary Accounting scenario: A Case Study Approach (Under Review)

- Doliya, P. and Singh, J.P. (2016). Auditing Fair Value Measurement: A Developing Economy Analysis. (Under Review)