

**© 2013**

**Victoria Chiu**

**ALL RIGHTS RESERVED**

**ACCOUNTING BIBLIOMETRICS: THE DEVELOPMENT AND  
INTELLECTUAL STRUCTURE OF ACCOUNTING RESEARCH**

By

VICTORIA CHIU

A dissertation submitted to the

Graduate School-Newark

Rutgers, The State University of New Jersey

in partial fulfillment of requirements

for the degree of

Doctor of Philosophy

Graduate Program in Management

Written under the direction of

Professor Miklos A. Vasarhelyi

and approved by

---

Professor Miklos A. Vasarhelyi

---

Professor Dan Palmon

---

Professor Ephraim Sudit

---

Professor Gary Previts

Newark, New Jersey

*October, 2013*

## **ABSTRACT OF THE DISSERTATION**

### **ACCOUNTING BIBLIOMETRICS: THE DEVELOPMENT AND INTELLECTUAL STRUCTURE OF ACCOUNTING RESEARCH**

by VICTORIA CHIU

Dissertation Director: Professor Miklos A. Vasarhelyi

Accounting publications serve as important channels of knowledge dissemination and discipline advancement. This dissertation examines the characteristics and citations' intellectual structure of accounting research using bibliometrics and graphical data mining techniques. This assessment contributes to accounting thought development literature in three areas.

The first essay examines the development of research characteristics and intellectual structure of *The Accounting Review* (TAR). Findings indicate that financial accounting has been the principal research area for recent TAR publications. Grounding theories have been drawn primarily from accounting, economics, and finance disciplines which are considered foundational to TAR research. Archival-primary, quantitative-regression and statistical modeling were found to be the most commonly applied methods. The top-cited and co-cited reference groups that led to the formation of TAR community are identified and compared across three temporal periods.

The continuous development of technology has been identified as a significant influence on accounting as a profession. In the last twenty years, auditing tasks have gradually shifted from a traditional paper-and-pencil format to a more electronic form. The second essay examines the ways in which methods for continuous auditing research have

progressed and the manner in which the intellectual community has approached its study. A synthesis is presented by providing an overview on the growth of continuous auditing since the late 1980s, classifying research content, and applying citation and co-citation analyses to identify influential research, scholars and revealing main reference clusters that contribute to the formation of the field.

Acknowledging one of the important goals of accounting research is to understand human information processing, decision making and its consequences, this essay examines chronologically the development of behavioral accounting research field using taxonomic classification and comparative analysis approaches. A comprehensive four dimensional taxonomy is created to shed light the characteristics of behavioral accounting research by systematically analyzing its research methods, accounting area, topical behavioral focuses and subtopical behavioral components. By comparing findings across six decades, this essay reveals multiple clustered attributes of behavioral accounting research (e.g., audit judgment, management controls, budgeting process, and auditor-client relationship) and its changes over time. Implications are addressed on emerging subfields and future research trend.

## ACKNOWLEDGEMENTS

I would like to express my deepest gratitude and appreciation to my dissertation advisor, Professor Miklos A. Vasarhelyi, who has provided me valuable guidance, full support and strong encouragement all along my Ph.D. studies; you will always be the mentor that led me to become a scholar and a finer person. I would also like to express my sincere gratitude to my dissertation committee members; to Professor Dan Palmon, your insightful advice and continuous support have strengthened me in becoming a better teacher and researcher since my program entrance; to Professor Ephraim Sudit, your warm encouragement and constructive feedback have greatly motivated and supported me in fine tuning my research; and to Professor Gary Previts, your insightful comments and valuable support have perfected my research work along the years. I am grateful for the special advice from Professor Michael Alles as well; your comments have always been beneficial to my dissertation and help improves it in many aspects.

I am indebted to my dear parents, Yuan-Shyi Peter Chiu and Singa Wang, and lovely sister, Tiffany Chiu. Your unconditional love, whole-hearted support, and continuous faith in me have enabled me to discover my potentials, achieve my goals and fulfill my dream. From the bottom of my heart, thank you all for making my achievement possible.

I owe thanks to my dearest friends, especially to Tzu, Qi, Dong Hyun, Yu-Hsin, Nader, Yuna, Hui, and Wan-Ling; your warm friendship and academic support will always be cherished. I would like to offer special thanks to Hua-Yao, your company and invaluable encouragement has strengthened me incredibly, thank you for standing by me throughout this journey.

Last but not least, I acknowledge the highest appreciation to my Heavenly Father God.  
Your immeasurable love has sustained me all along the years, my gratitude and praise to  
You is beyond words expression.

## **DEDICATION**

To my Lord and family, Yuan-Shyi Peter Chiu, Singa Wang and Tiffany Chiu.

## Table of Contents

### ACCOUNTING BIBLIOMETRICS: THE DEVELOPMENT AND INTELLECTUAL STRUCTURE OF ACCOUNTING RESEARCH

ABSTRACT OF THE DISSERTATION .....	ii
ACKNOWLEDGEMENTS .....	iv
DEDICATION .....	vi
LIST OF TABLES .....	x
LIST OF FIGURES .....	xii
LIST OF EQUATION .....	xiii
CHAPTER 1 .....	1
INTRODUCTION .....	1
1.1 OVERVIEW .....	1
1.2 METHODOLOGY AND RESEARCH QUESTIONS .....	4
CHAPTER 2 .....	7
A BIBLIOMETRIC ANALYSIS OF THE INTELLECTUAL STRUCTURE AND CHARACTERISTICS OF RESEARCH PUBLISHED IN <i>THE ACCOUNTING REVIEW</i> (TAR) .....	7
2.1 OVERVIEW .....	7
2.2 LITERATURE REVIEW AND RESEARCH QUESTIONS .....	11
2.2.1 The Premier Accounting Journal — TAR .....	11
2.2.2 The Characteristics of Accounting Research – Using Content Analysis .....	14
2.2.3 The Intellectual Structure of Accounting Research – Using Citation and Co-Citation Analyses .....	16
2.2.4 Integrating Multiple Bibliometrics in Accounting Research .....	19
2.3 METHODOLOGY .....	20
2.3.1 Data Collection - TAR Articles and Bibliographies Retrieval .....	20
2.3.2 Data Preprocessing .....	20
2.3.3 Content Analysis - A Taxonomic Classification Approach .....	21
2.3.4 Citation Analysis and Co-Citation Analysis .....	23
2.4 RESULTS AND ANALYSIS .....	24
2.4.1 Research Characteristics of TAR (1994-2008) .....	24



2.4.2 TAR Citation Analysis and Co-Citation Clustering .....	30
2.5 CONCLUSION .....	45
CHAPTER 3 .....	49
THE DEVELOPMENT AND INTELLECTUAL STRUCTURE OF CONTINUOUS AUDITING RESEARCH .....	49
3.1 OVERVIEW .....	49
3.2 A REVIEW OF CONTINUOUS AUDITING RESEARCH .....	51
3.2.1 The Emergence of Continuous Auditing: Electronic Data Processing and Audit Automation .....	51
3.2.2 Demanding and Promoting Real-time Reporting and Assurance .....	53
3.2.3 Continuous Controls Monitoring .....	56
3.2.4 Implementation of Continuous Auditing and Continuous Controls Monitoring .....	58
3.3 CHARACTERISTICS OF CONTINUOUS AUDITING RESEARCH .....	60
3.3.1 Methodology: Article Source and Collection .....	60
3.3.2 Taxonomic Categories Development .....	63
3.3.3 Findings: Characteristics of Continuous Auditing Literature .....	66
3.4 INTELLECTUAL STRUCTURE OF CONTINUOUS AUDITING RESEARCH .....	69
3.4.1 Methodology: References Collection, Citation and Co-Citation Analysis .....	69
3.4.2 Findings: The Intellectual Structure of Continuous Auditing Research .....	71
3.5 CONCLUSION AND IMPLICATIONS .....	91
CHAPTER 4 .....	95
THE ADVANCEMENT OF BEHAVIORAL ACCOUNTING RESEARCH .....	95
- A TAXONOMIC ANALYSIS ON RESEARCH CHARACTERISTICS .....	95
4.1 OVERVIEW .....	95
4.2 A REVIEW OF BEHAVIORAL ACCOUNTING RESEARCH FIELD .....	97
4.2.1 The Emergence and Scope of Behavioral Thought in Accounting .....	97
4.2.2 Early Development of Behavioral Research: 1960s - 1980s .....	99
4.2.3 Development of Behavioral Research: 1990s to Date .....	101
4.2.4 The Influence of Major Accounting Journals on BAR's Development .....	104
4.2.5 Accounting Education and Accounting Practice Influences on BAR .....	107
4.3 METHODOLOGY .....	109

4.3.1 Data Collection and Preprocessing - BAR Publications .....	109
4.3.2 Taxonomy Development and Classification.....	110
4.3.3 BAR Publications Distribution by Year and Journals .....	111
4.4 RESULTS AND ANALYSIS .....	112
4.4.1 Temporal Periods Distribution of Behavioral Accounting Research .....	112
4.4.2 Journal Distribution of Behavioral Accounting Research .....	114
4.4.3 Research Characteristics.....	115
4.5 CONCLUSION AND IMPLICATIONS .....	129
CHAPTER 5 .....	132
CONCLUSION AND IMPLICATIONS.....	132
5.1 A Summary of Main Findings in Three Essays .....	132
5.2 Limitations, Future Research and Implications.....	137
REFERENCES .....	145
APPENDICES .....	157
APPENDIX I.....	157
Taxonomy Classes.....	157
APPENDIX II .....	158
Co-Citation Count Matrix .....	158
APPENDIX III .....	171
Continuous Auditing Literature Directory .....	171
APPENDIX IV .....	172
Citation and Co-Citation Analysis Statistics.....	172
APPENDIX V .....	173
Behavioral Research in Accounting Taxonomy.....	173
APPENDIX VI.....	174
Characteristics Index of Behavioral Research in Accounting.....	174
APPENDIX VII.....	175
CURRICULUM VITAE.....	176

## LIST OF TABLES

TABLE 1	TAR Articles and Citations Used.....	20
TABLE 2	Description of the Five Taxonomy Classes ( <i>ARD</i> ).....	22
TABLE 3	Statistical Distribution and Ranking of Research Methods.....	26
TABLE 4	Statistical Distribution and Ranking of Mode of Reasoning.....	26
TABLE 5	Statistical Distribution and Ranking of School of Thought.....	27
TABLE 6	Statistical Distribution and Ranking of Accounting Area.....	28
TABLE 7	Statistical Distribution and Ranking of Foundation Discipline.....	29
TABLE 8	Period I: Main Clusters in the Co-Citation Network.....	33
TABLE 9	Period II: Main Clusters in Co-Citation Network.....	38
TABLE 10	Period III: Main Clusters in Co-Citation Network.....	43
TABLE 11	Comparison of Core Cluster in Three Periods.....	47
TABLE 12	Explanation of Topical Areas.....	64
TABLE 13	Description of Specific Area of Emphasis.....	65
TABLE 14	Distribution of Articles by Research Method.....	66
TABLE 15	Distribution of Articles by Topical Area.....	67
TABLE 16	Distribution of Articles by Specific Area of Emphasis.....	68
TABLE 17	Distribution of Articles by Geographical Area.....	69
TABLE 18	Emerging Period's Citation Frequency ( $>1$ ).....	73
TABLE 19	Citing Articles of Frequent Co-Cited References.....	73
TABLE 20	Developing Period I: Cluster #2-1 and #2-2.....	77
TABLE 21	Developing Period I: Cluster #2-3.....	79
TABLE 22	Developing Period I: Cluster References #2-1.....	80

TABLE 23	Developing Period I: Cluster References #2-2 and #2-3.....	82
TABLE 24	Developing Period II: Cluster #3-1 and #3-2.....	86
TABLE 25	Developing Period II: Cluster #3-3.....	88
TABLE 26	Developing Period II: Cluster References #3-1.....	89
TABLE 27	Developing Period II: Cluster References #3-2 and #3-3.....	91
TABLE 28	Top 10 Journals With Behavioral Accounting Publications.....	116
TABLE 29	Research Method & Accounting Area Count and Percentage.....	118
TABLE 30	Research Methods - Percentage Distribution Over Temporal Periods....	118
TABLE 31	Accounting Area - Percentage Distribution Over Temporal Periods.....	120
TABLE 32	Topical Behavioral Focus Count and Percentage.....	122
TABLE 33	Topical Behavioral Focus - Percentage Distribution Over Temporal Periods.....	126
TABLE 34	Key Aspects and Contributions in Three Essays.....	140

## LIST OF FIGURES

FIGURE 1	Period I 1994-1998: Co-Citation Clusters.....	32
FIGURE 2	Period II 1999-2003: Co-Citation Clusters.....	37
FIGURE 3	Period III 2004-2008: Co-Citation Clusters.....	41
FIGURE 4	Continuous Auditing Literature Distribution by Year.....	61
FIGURE 5	Continuous Auditing Literature Distribution by Journal.....	62
FIGURE 6	Emerging Period: Co-Citation Network.....	72
FIGURE 7	Emerging Period: Co-Citation Group (Threshold>0).....	74
FIGURE 8	Developing Period I: Full Co-Citation Cluster.....	75
FIGURE 9	Developing Period I: Top 123 Co-Citation Pairs (Threshold $\geq 0.38$ ).....	76
FIGURE 10	Developing Period II: Full Co-Citation Network.....	83
FIGURE 11	Developing Period II: Top 58 Co-Citation Pairs ( $\geq$ Threshold 0.31).....	84
FIGURE 12	Yearly Distribution of Behavioral Accounting Research.....	113
FIGURE 13	Temporal Periods Distribution of Behavioral Accounting Research.....	114

## LIST OF EQUATION

EQUATION 1	Co-Citation Calculation.....	24
------------	------------------------------	----

## CHAPTER 1

### INTRODUCTION

#### 1.1 OVERVIEW

This dissertation examines the development of research characteristics and citations' intellectual structure of the accounting and accounting information systems research, specifically in three areas of the literature - *The Accounting Review* (TAR) publications, continuous auditing research and behavioral accounting research. Accounting bibliometric techniques are utilized to systematically examine accounting literature through reviewing research articles' content, analyzing citations and co-citations structure statistically, and visualizing accounting knowledge collaboration network graphically in the three essays of this dissertation. The heart of this research lies in revealing accounting research characteristics and accounting citations' communication network, and identifying the transitions in which over time. The organization of this dissertation is as follows: Chapter one introduces the motivation, grounding literature, and main research issues of this thesis. The three examining research essays are chapters two, three, and four, respectively. The last chapter concludes the dissertation by providing a summary of findings and future research implications.

Accounting publications contribute to the dissemination of accounting knowledge and advancement of scholarly thoughts in the accounting discipline. In the past few decades, literature has examined accounting research dimensions, attributes, and paradigms evolution in several academic journals by different time frames (Chatfield 1975; Dyckman and Zeff 1984; Brown et al. 1987; Brown et al. 1989; Vasarhelyi et al. 1988;

Hopwood 2007; Heck and Jensen 2007). Accounting scholars in the academia recognize the importance of reviewing the accomplishments of accounting journals (Lindquist and Smith 2009).

*The Accounting Review* (TAR) has long been viewed as a highly regarded accounting academic research journal outlet that impacts the development and dissemination of accounting thought within the discipline greatly (Heck and Bremser 1986; Williams 1994; Williams and Rodgers 1995; Rodger and Williams 1996; Heck and Jensen 2007). The first essay of this dissertation examines the research contribution in characteristics and citations knowledge structure of publications in this top-tier accounting journal *The Accounting Review* (TAR). Specifically, research characteristics of *The Accounting Review* (TAR) and citation groups that formed the contribution of research published in *The Accounting Review*'s within 1994-2008 are studied by applying content analysis, citations analysis and co-citations analysis. Findings in the first essay also shed light on the changes of research characteristics of *The Accounting Review* research over time and reveal the advancement and intellectual communication structure of several main research clusters that have contributed to the leading research in recent accounting scholarship.

The second essay investigates auditing literature with specific focus on continuous auditing research to understand its development, achievement, and research communication network in the past decade. Prior to the emergence and wide spread applications of information technology, financial statements auditing and assurance processes have been conducted manually. The vision project of the American Institute of Certified Public Accountants (1998) stated that advances in technology are significant



forces affecting the accounting profession. Auditing tasks have been gradually moving toward electronic, online and real-time based along with technology advancement. Therefore, the notion of continuous auditing, which is defined as a methodology that enables independent auditors to provide written assurance on a subject matter, for which an entity's management is responsible, using a series of auditors' reports issued virtually simultaneously with, or a short period of time after, the occurrence of events underlying the subjects matter performs financial statements assurance on a more current basis versus traditional auditing procedures (AICPA/CICA 1999) is gaining importance. The implementation of continuous auditing in both internal and external audit is expected to become an inevitable trend in auditing field.

Acknowledging the importance of this research area in the accounting field, the second essay examines the emergence and knowledge network of continuous auditing research and attempts to explore future directions of continuous auditing research as well. A comprehensive review on the determinants and circumstances that triggered the emergence of continuous auditing field is introduced in the first section of the essay. The second section applies content analysis to reveal research attributes of continuous auditing literature, citation analysis to identify influential articles and researchers of continuous auditing research community. Co-citation analysis technique is used to further examine research clusters that formed continuous auditing research community as well as indicate potential emerging areas of the field.

Understanding human information processing, decision/judgment making and other behavioral variables' relation and role-playing within the accounting field has been prominently advocated in the literature as important accounting research issues since the

1970s. The third essay provides a chronological overview of the progression of behavioral accounting research and ties in discussions regarding journal contributions, accounting education and practice behavioral accounting aspects. A comprehensive four-dimension taxonomy on behavioral accounting characteristics is created to identify its development and transitions over time. Findings of research methods, accounting area, topical behavioral focus, and subtopical behavioral components are cross compared in three temporal periods over six decades to enable understandings of progression in subfields and implications of current and future research trend in the behavioral accounting research field.

## **1.2 METHODOLOGY AND RESEARCH QUESTIONS**

To understand the structural evolution and interaction of scientific knowledge in disciplines and/or specific research areas, employing bibliometrics on the content of research and the references cited in publications have been regarded as useful measures in both information science and social science fields (Garfield 1964; Cawkell 1976; Garfield 1979; Garfield 1983; Weber 1990). Bibliometrics enable researchers from any discipline to not only examine research contributions and understand scholarly thought development but also visualize intellectual structure of their particular areas of interest with graphical data mining tools. This dissertation applies bibliometrics of content analysis (Weber 1990; Stemler 2001), citation analysis and co-citation analysis (Garfield 1964; Small 1973; Garfield 1993) to address the following research questions in the three essays.

The first essay examines three research questions on the contribution and formation of TAR research by identifying research characteristics and visualizing research clusters that lead to its development in three five-year time periods. The three research questions include 1) what research characteristics have been developed in TAR community and how has it changed over time? 2) what areas of research define the intellectual structure of TAR community? and 3) how has the knowledge network of TAR evolved over time?

The second essay investigates the development and intellectual structure of continuous auditing research. Acknowledging the importance of continuous auditing research area in accounting field, this essay addresses the following research questions. First, what circumstances and factors lead to the emergence of continuous auditing field? Second, what are the influential research articles in continuous auditing and who are the notable researchers that contributed to the achievement in the community? Last, what groups of research constructed the intellectual structure of continuous auditing field?

The final essay examines the progression of the behavioral accounting research field over the prior six decades. The study first provides a historical overview of the research development of behavioral accounting area and then addresses research questions regarding the four dimensional characteristics with respect to research method, accounting area, topical focus and subtopical component of the behavioral field and its development. The specific research questions addressed are 1) how did the behavioral accounting research field emerge in the accounting discipline? 2) what are the main research attributes identified longitudinally in the behavioral accounting field? 3) what are the main research characteristics that can be identified in the early two decades (1950-1970), middle two decades (1971-1991) and the recent two decades (1992-2013)? 4) how

has changes occurred over time and what areas are considered newly developed in behavioral accounting field? Collectively, the third essay provides historical and comparative analysis of behavioral accounting research characteristics by applying a taxonomic classification approach.

The next chapter presents the first essay of this dissertation on the intellectual structure and characteristics of research published in *The Accounting Review* from 1994 to 2008.

## CHAPTER 2

### A BIBLIOMETRIC ANALYSIS OF THE INTELLECTUAL STRUCTURE AND CHARACTERISTICS OF RESEARCH PUBLISHED IN *THE ACCOUNTING REVIEW* (TAR)

#### 2.1 OVERVIEW

This essay examines the development of the research characteristics and intellectual structure of leading research published in *The Accounting Review* (hereafter, *TAR*) between 1994 and 2008. Academic journals in accounting serve as important media for disseminating knowledge and advancing the accounting field. Among these journals, *TAR* has been recognized as one of the highly regarded academic journals that significantly influences the progression of accounting scholarship. This premier journal is perceived as the standard of excellence in the accounting field and has the potential to influence the development of research ideas (e.g., Williams 1985; Heck and Bremser 1986; Smith 1994; Williams and Rodgers 1995).

Researchers recognize the importance of reviewing the accomplishments in academic journals (Lindquist and Smith 2009). The considerable interest in studying the contributions of leading journals partially results from the critical role that publishing plays in academic career and institutional development (Allen and Inkpen 1991). By valuing the importance of revealing accounting research thought, research characteristics and the development of intellectual structure, another area of literature periodically evaluates the historical characteristics and trends of accounting research that shed light on the field's progression. The development of accounting thought and research

characteristics have been examined in the prior literature in a number of different topic areas, publications and time periods. For example, literature has revealed the attributes and evolution of accounting publications from time to time either for multiple top ranked accounting journals as a whole (e.g., Brown et al. 1987; Vasarhelyi et al. 1988; Hopwood 2007) or in specified accounting journal, such as TAR (e.g., Chatfield 1975; Williams 1985; Williams and Rodgers 1995) and JAR (e.g., Dyckman and Zeff 1984). Institutional research contributions and authorship collaboration have also been studied jointly with research content development (e.g., Heck and Bremser 1986; Fleming et al. 2000).

TAR has been perceived as the standard of excellence in the accounting research field and has the potential to influence the development of ideas in accounting research (Williams 1985). TAR publication is one of the important indicators of accounting research acceptability (Coe and Weinstock 1969, 1983; Weber and Stevenson 1981). Smith (1994) examined 93 accounting journals of both academic and professionals for their relative contributions to the overall field of accounting and TAR was ranked in first place by international specialists and in second place by auditing and government specialists. TAR was also perceived as the most important journal by academic institutions with doctoral programs in the rankings.

One of the concerns raised in recent accounting scholarship is whether the communication and collaboration between academic research and accounting professional practice is sufficient (Kaplan 2011). Arguments on the state and direction of accounting research gradually becoming detached from practice and growing less innovative have also been expressed in earlier studies (Bricker and Previts 1990; Hopwood 2007). While TAR has been regarded as a leading journal in accounting field,

critiques argue that TAR publication focuses have apparently shifted from education and practice oriented to becoming more rigorous in the application of positivist methods since the 1980s. And as academic research grown to be relatively more incomprehensible, having accounting practitioner as audience became much more difficult (Flesher 1991; Heck and Jensen 2007).

While fully addressing this concern will certainly require much effort from academics and practitioners via various sources (such as institution wide effort, journal editorial boards/policies, Ph.D. guidelines on education/courses, and research collaboration with accounting firms), as a starting point of easing or coping with this issue, researchers would need to step back and draw more attention to understanding the nature of current accounting scholarship, the areas and directions of accounting research progression, and the existing gaps thus far, prior to facilitating stronger collaboration and advancement between accounting scholarship and practice. Upon reviewing the literature, limited historical examination has been conducted to identify the recent movement of accounting scholarship since mid 90s, compared to the period from late 70s to early 90s. Acknowledging the significance of TAR and the aforementioned concern raised in prior literature, this study aimed to reveal the characteristics of the research published in TAR and to identify the knowledge clusters that influenced the scholarly thought development of TAR in the recent 15-year period. The three main research questions addressed in this study were as follows.

- Research Question 1: What are the characteristics of recent research developed in TAR community?

- Research Question 2: What areas of research constitute the intellectual structure of TAR community?
- Research Question 3: How have the research characteristics and intellectual structure of TAR community evolved over time?

To address these research questions, content analysis, citation analysis and co-citation analysis bibliometrics were applied. The analysis began with the collection of TAR articles published in 1994–2008 from the *EbscoHost* literature database and the retrieval of TAR bibliographies from the ISI Web of Knowledge<sup>1</sup>. Articles were classified by a taxonomy of topic areas, applied methodologies, reasoning techniques and foundation theories<sup>2</sup> to address the research characteristics. Citation and co-citation analyses were used to identify influential references from TAR bibliographies and to reveal highly co-cited reference pairs that formed the intellectual structure of recent TAR research. The main knowledge groups were then visualized using graphical clustering tools. Discussion on the results analyses was broken down into three sub-periods (1994–1998, 1999–2003, and 2004–2008) to enable comparisons of intellectual progression over time<sup>3</sup>.

Building upon the literature on accounting thought development, this assessment contributes to the accounting field by revealing the recent progression and the intellectual communication of leading academic research. This study specifically demonstrates attributes of TAR publications and the citations' knowledge clusters that have led to the formation of the recent TAR community. Findings suggest that financial accounting has

---

<sup>1</sup> Thomson Reuters' (ISI) Web of Knowledge is a research platform that provides access to objective content and tools to search, track, measure and collaborate in the sciences, social sciences, arts, and humanities. See: <http://wokinfo.com/>

<sup>2</sup> The taxonomy used in this study was retrieved from the *Accounting Research Directory (ARD)* (Brown and Vasarhelyi 1985, 1994). The directory incorporates currently article attributes for the academic journals of 11 leading accounting and accounting information systems. This study examined five categories of the taxonomy— research method, mode of reasoning, school of thought, accounting area, and foundation discipline. The definition of categories is described in detail in the methodology section.

<sup>3</sup> In line with previous literature by Just (2010) and Badua (2011).



been the principal research area. Furthermore, archival-primary and quantitative-regression methods and statistical modeling for efficient market hypotheses were found to be the techniques most commonly used. Foundation theories have been drawn primarily from the accounting, economics, and finance disciplines, which can be considered foundational to TAR research. Main research clusters across the three time sub-periods were demonstrated by top-cited and co-cited references. Overall, the findings from statistics of content analysis and citations intellectual network both indicated that contemporary TAR publications in the recent 15 years yet demonstrate research contributions of a relatively narrow perspective of accounting scholarship which is in line with many qualitative critiques in the prior literature (e.g., Flesher 1991; Heck and Jensen 2007). Implications can be drawn from findings in this study to understand the topical areas that have been more extensively researched on in the accounting field over time and to address the areas that still require more consideration and attention in the academia.

The next section reviews the relevant literature on accounting characteristics and thought development. The third section addresses the research methodology used in this study and then discusses the implications of the results. The last section concludes with a summary of findings, limitations, and directions of future research.

## **2.2 LITERATURE REVIEW AND RESEARCH QUESTIONS**

### **2.2.1 The Premier Accounting Journal — TAR**

TAR has been an influential and leading accounting journal for the development of accounting concepts and the dissemination of validated accounting knowledge (Heck and

Bremser 1986; Williams and Rodgers 1995). The editorial policy<sup>4</sup> of TAR states the purpose, scope, and vision of this academic journal. These policies may be summarized as follows: TAR is expected to be the premier journal for publishing articles, reporting the results of accounting research, and explaining and illustrating related research methodology. The journal aims to promote wide dissemination of the results of systematic scholarly inquiries into the broad field of accounting. Its primary audience should be academicians, graduate students, as well as others interested in accounting research, and the primary criterion for publication in TAR is the significance of the contribution that an article makes to the literature. The topic areas of publication interest consist of accounting information systems; auditing and assurance services; financial accounting; management accounting; taxation; and all other areas of accounting, broadly defined. The journal is open to all rigorous research methods with the scope of its acceptance of articles embracing any research methodology and accounting-related subject as long as the articles meet the standards established for publication in the journal.

Previous literature has examined TAR publications from a number of aspects (e.g., Chatfield 1975; Williams and Rodgers 1995; Fleming et al. 2000; Heck and Jensen 2007). Chatfield (1975) examined the development of research in the first 50 years of TAR from a qualitative-historical perspective. From a conservative observation, the nature of TAR publications has seemingly gone through four stages in its first 50 years. At the formative phase, the published literature's emphasis was on aiding accounting education, university curricula and communications among educators. The second phase

---

<sup>4</sup> TAR editorial policy was developed by the AAA Publications Committee and published in *Accounting Education News* in June 1987 after endorsement by the Executive Committee.

of growth focused on accounting theory-based studies and then leaned toward the transition of accounting practices and regulations. Empirical studies started to dominate in the late 1950s, which enlarged the range of issues discussed in the accounting discipline through the investigation of other disciplines' contributions to the accounting field. Since the 1960s', theory-based research in accounting has been less emphasized.

Fleming et al. (2000) conducted research on TAR publications between 1966 and 1985. Their study explored the evolution of accounting publication by research methods, financial accounting topics, citations, and authorship background and compared their findings with TAR contributions in previous years (1926–1945 and 1946–1965). A more recent study by Heck and Jensen (2007) provided a historical analysis of TAR publications by authorship characteristics, concentrated research methods, accounting topics, and accounting practice issues from 1926 to 2005. The study found that the expertise of TAR scholars in the first 40 years was mainly in accounting whereas mastering quantitative modeling then became more advantageous in order to be seen as a leading scholar with the transition occurring in the 1960s.

Overall, the literature suggests that along with accounting knowledge evolution and transition of accounting scholarship, positivist based methods have took the lead of positioning what is considered rigorous research and how research is qualified to be published in this top tier journal in accounting discipline. While stating how accounting field ought to be is challenging, growing and maintaining the diversity of accounting scholarship that consists of prosperity in many subareas should almost certainly be considered as one of the critical conditions to fulfill in a given discipline, which could represent a solid development of the breadth of knowledge. Prior literature has attempted

to show TAR's progression by using a historical-qualitative approach with little quantitative reasoning, our study recognizes the importance of TAR in the accounting domain and aims to fill in the research gap of not having solid analytical and quantitative based evidence by providing an empirical analysis of recent TAR contributions using multiple bibliometrics.

### **2.2.2 The Characteristics of Accounting Research – Using Content Analysis**

Researchers have recognized the importance of reviewing the accomplishments in academic accounting journals (Lindquist and Smith 2009). Content analysis is one of the main bibliometric techniques used to analyze the nature and attributes of research contributions. Bibliometrics are deemed as useful tools in the literature for 1) evaluation and analysis of the structure of accounting knowledge (McRae 1974; Hofstedt 1976; Brown et al. 1987; Bricker 1988; Bricker 1989; Lee 1995; Williams and Rodgers 1995; Reiter and Williams 2002); 2) differentiation of authors/articles that have the greatest impact on accounting research (Brown and Gardner 1985; Brown et al. 1987; Brown 2003; Milne et al. 2008; Chan et al. 2009), and 3) analysis of publication outlets and rankings of school programs (Brown and Gardner 1985b; Brown 1996; Bonner et al. 2006; Coyne et al. 2009).

Journal publication is one of the main means of knowledge dissemination and communication in a field. Previous studies have applied content analysis to examine certain sets of articles/journals during a specified time frame to reveal the evolution of a topical area in a discipline. For example, Brown and Gardner (1985a) assessed the overall

impact and contributions of the main research journals (TAR, JAR, JAE and AOS)<sup>5</sup> on contemporary accounting research. These selected journals were perceived as the most reputable accounting research journals (Howard and Nicolai 1983). Vasarhelyi et al. (1988) examined the trends of accounting research from 1963 to 1984 by employing a quantitative examination that focused on the publication frequency and the dominant taxonomies (i.e., foundation discipline, school of thought, research method, and mode of reasoning). The study applied quantitative techniques, statistics and exploratory data analysis on the journals TAR, JAR, AOS, JAE, JAAF and AUD<sup>6</sup>. The findings implied that accounting research has imported its theory primarily from economics and psychology since 1976. The most steadily increasing trends since 1963 appeared to have been in the behavioral, statistical modeling, archival, empirical, and quantitative areas of studies since. Brown et al. (1987) studied research contributions in *Accounting, Organizations and Society* (AOS) from 1976 to 1984, using both content and citation analyses. The study concluded that AOS was able to achieve its aims and scope and that the journal serves as a complement outlet for research involving international, behavioral, organizational, and social accounting topics.

Taken together, prior literature has revealed the importance of periodically tracing the development of academic research as well as the influential role that TAR plays in our domain. However, this stream of research has been less populous in the recent decade. Considering also the aforementioned concerns and critique raised in recent literature on the imbalanced state of accounting scholarship and its distanced relationship with

---

<sup>5</sup> The Accounting Review (TAR), Journal of Accounting Research (JAR), Journal of Accounting and Economics (JAE), and Accounting Organizations and Society (AOS).

<sup>6</sup> The Accounting Review (TAR), Journal of Accounting Research (JAR), Accounting Organizations and Society (AOS), Journal of Accounting and Economics (JAE), Journal of Accounting, Auditing & Finance (JAAF), and Auditing: A Journal of Practice & Theory (AUD).

professional practice, this first research question aims at examining the recent TAR research from 1994–2008 using content analysis to detail the research characteristics of five taxonomic categories to evaluate the current state of research contributions by characteristics. The first research question addressed was:

**RQ1: What are the characteristics of recent research developed in TAR community?**

### **2.2.3 The Intellectual Structure of Accounting Research – Using Citation and Co-Citation Analyses**

Investigating reference networks and publication citations provides us with possibilities for approaching research thought and the evolution process of knowledge (Hoffman and Holbrook 1993). Citation analysis, another commonly used bibliometric method, originated from the information science discipline to quantitatively analyze scientific and technological literature (Garfield 1972). While mostly used in library and information science domains, this method receives wide applications in other fields, where it is used to statistically evaluate the structure and communication of the literature (Osareh 1996a).

Citations provide a measure of the number of formal messages passed through knowledge systems and enable the formation of an index to measure the influence of one knowledge system on another (McRae 1974). The underlying premise of this technique is that frequently cited articles are likely to have higher influence than less cited articles (Culnan 1986). This method was first applied in accounting research by McRae (1974) and has since been used for analysis in a number of articles (e.g., Dyckman and Zeff 1984; Brown and Gardner 1985a). In applying citation analysis to 17 accounting journals in 1968–

1969, McRae (1974) examined the information flow within the accounting research network and also the communication between accounting and other fields. The study found that there was heavy commuting traffic from other business fields to the accounting knowledge system. Overall, the accounting knowledge system was found to be relatively open to outside influences but showed little influence on social science domains.

The literature revealed that citation analysis is also useful for deriving journal rankings and evaluating authors' and program/institutions' research performance (e.g., Dyckman and Zeff 1984; Brown and Gardner 1985a, 1985b). Brown and Gardner (1985a) applied citation analysis to evaluate the research contributions of accounting faculty and doctoral programs with a focus on four journals in 1976–1982. The study evaluated the influence of articles by citation frequency, using 4948 citations for 1574 articles by 712 accounting researchers. Dyckman and Zeff (1984) used citation analysis to measure the impact of the *Journal of Accounting Research* (JAR) for over 20 years. The study concluded that JAR has established a premier role in the empirical research tradition in accounting, focusing on capital markets and behavioral work, and that it improves the integration of accounting ideas and methods from other disciplines.

Co-citation analysis is a method extending from citation analysis that is useful for identifying linkages and relationships within journals, topics, authors, keywords, and research methods (Small 1973; Price 1986; McCain 1990). It is a method based on the assertion that scientific fields can be regarded as a system of linkages among citations (Kuhn 1970). The co-citation method reveals the communication among networks in a given research field and provides a historical view of the field's intellectual structure

(McCain 1986, 1990). In the accounting literature, Bricker (1989) was the first to apply both citation and co-citation analyses to examine 1) the extent of research areas nesting in the inferred disciplinary structure; 2) the number of research areas that are at the lowest level of specialization; and 3) the role that accounting journals play in integrating accounting research through their breadth of coverage of individual research areas. The findings indicated that some accounting research areas are relatively well integrated (Financial cluster – market-based and time-series research) while moderate degrees of nesting were found in managerial and human information processing/behavioral research areas.

Scholars are able to trace the progression and transition of knowledge structure in a field and research area using citation and co-citation methods. With the application of data mining graphical clustering in this study, relationships identified via citation and co-citation tools can be visualized to aid the inference of core clusters and their development in the field (e.g., Just 2010). The scope of accounting research that utilizes bibliometrics is still relatively narrow compared to that of other fields: this study proposed to take advantage of these tools' usefulness to shed light on the intellectual structure of communication in the recent TAR community. The second research question that we addressed was therefore as follows:

**RQ2: What areas of research constitute the intellectual structure of TAR community?**



### **2.2.4 Integrating Multiple Bibliometrics in Accounting Research**

The literature in recent years has begun to apply multiple bibliometrics to reveal both the development of accounting thought and the formation of research structure in specified fields (Just 2010; Badua et al. 2011). Badua et al. (2011) examined accounting research published in CAR<sup>7</sup>, JAR and TAR since 1963 by characterizing its content by taxonomic properties and examining the interaction between scholars by citations. The findings suggested that mainstream accounting research demonstrates topical and methodological differences over time. The focus of accounting research has evolved from mainly qualitative studies on accounting theory to conducting quantitative studies using archival data with theories drawn from finance and economics disciplines. A considerable amount of research is found to be using theories from the areas of information economics and psychology. In addition, the study argued that research content and communication can be useful measures for research quality. There may be value to construct a metric that considers the diversity of journal methods, and the topics and their level of integration to improve the usefulness of citation measures that are currently used.

In line with prior research, this study has integrated multiple bibliometric techniques, i.e., taxonomic content analysis, citation analysis and co-citation analysis, to address TAR's recent research characteristics and intellectual structure. The third research question was an extension from the first two research questions to further analyze the development of characteristics and intellectual structure over three time sub-periods.

#### **RQ3: How have the research characteristics and intellectual structure of TAR community evolved over time?**

---

<sup>7</sup> Contemporary Accounting Research (CAR).

## 2.3 METHODOLOGY

### 2.3.1 Data Collection - TAR Articles and Bibliographies Retrieval

Research published in TAR from 1994 to 2008 was collected from the *EbscoHost* academic database. A total of 519 articles<sup>8</sup> (Table 1) were retrieved to conduct content analysis by five taxonomic categories: research methods, mode of reasoning, school of thought, accounting area, and foundation discipline. Bibliographies cited in TAR research were retrieved from the ISI Web of Science database to conduct citation and co-citation analyses.

**TABLE 1**  
**TAR Articles and Citations Used**

Period		Number of References Collection (excluding standards & regulation)	No. of TAR Articles
<i>1994</i>	<i>1998</i>	3969	137
<i>1999</i>	<i>2003</i>	5471	154
<i>2004</i>	<i>2008</i>	9692	228
<i>Total</i>		<i>19132</i>	<i>519</i>

### 2.3.2 Data Preprocessing

Part of the retrieved bibliographies contained misspelled/incomplete author names, journal titles, volume numbers, and page numbers. These clerical errors could have led to miscomputation of citation frequencies, therefore, it was necessary to manually check and preprocess all references prior to computing citation frequencies and undertaking co-citation analysis. In addition, as the main research objectives were to identify the development of TAR and the academic research network that contributes to the formation

---

<sup>8</sup> Editorials, commentary, notes and research less than four pages long were excluded from our analysis, in line with the previous literature (e.g., Vasarhelyi et al. 1988).

of TAR, references on accounting standards/regulation were excluded from our analysis. After reviewing and editing the bibliographies, we arrived at a total of 19,132 references (Table 1).

### **2.3.3 Content Analysis - A Taxonomic Classification Approach**

To address the development of the research characteristics of the literature published in TAR, this study employed content analysis by manually classifying TAR publications into five dimensions, namely, research method, mode of reasoning, school of thought, accounting area, and foundation discipline. Publications are perceived as the discipline's core knowledge and content analysis provides descriptive results of their nature. The taxonomic categories applied in this study (Table 2) along with seven others were developed by Vasarhelyi and Berk (1984) and used for classifications in the *Accounting Research Directory* (ARD 1985, 1994). The *Accounting Research Directory* (ARD) is an academic database of research attributes containing classifications of article attributes for 13 leading accounting journals<sup>9</sup>. The usage and purpose of the ARD is to facilitate the research efforts of accounting academics and practitioners by listing, evaluating, and categorizing the major articles. The classification process was carried out by mainly reviewing the abstract, introduction, and conclusion sections of articles to identify the specific subclass into which the articles fell in each taxonomic category. Referring to

---

<sup>9</sup> Accounting Historians Journal (AHJ), Accounting, Organizations and Society (AOS), Auditing: A Journal of Theory and Practice (AUD), Contemporary Accounting Research (CAR), International Journal of Accounting Information Systems (IJAS), Journal of Accounting and Economics (JAE), Journal of Accounting Public Policy (JAPP), Journal of Accounting Research (JAR), Journal of Accounting, Auditing, and Finance (JAAF), Journal of Emerging Technologies in Accounting (JETA), Journal of Information System (JIS), Research in Accounting Regulation (RAR), The Accounting Review (TAR). Over time, classification classes and their application scope have expanded along with the research progress in accounting and accounting information systems. The current ARD is available on Rutgers Accounting Research Web online for queries: <http://raw.rutgers.edu/ard/query.php>. The full twelve taxonomy classes used to identify research classifications in ARD are provided in Appendix I.

methodology and/or results sections was potentially necessary to determine the subclasses when additional information is required during the classification process.

The description of the five taxonomic categories applied in this study is provided in Table 2. Focusing on these research dimensions enabled the identification of TAR researchers' methodology usage, accounting areas of interest and contribution to other fields as well as the theories in which their research based upon.

**TABLE 2**  
**Description of the Five Taxonomy Classes (*ARD*)**

Research Method	Indicates which type of study underlies the research article which contains three main areas: analytical, archival, and empirical. Analytical studies apply either internal logic or simulations. Archival studies utilize sources either from primary or secondary records. Empirical studies can be carried out as case, field, lab experiments or opinion surveys.
Mode of Reasoning	Classifies the technique used to formally arrive at the conclusions of the study, either by quantitative or qualitative analysis. Quantitative subcategory include various items, e.g., descriptive statistics, regression, ANOVA, factor analysis, non-parametric, correlations, and analytical.
School of thought	Indicates which major area of accounting research the article contributes to. Major areas include behavioral, statistical modeling, accounting theory, accounting history, institutional, agency theory, and expert systems.
Accounting Area	Categorizes the major accounting field this paper falls under. The major fields are tax, financial, managerial, audit, and information systems.
Foundation Discipline	Identifies the underline academic area that the research is based on which includes psychology, sociology, political science, philosophy, economics and finance, engineering, mathematics, statistics, law, accounting and management.

### **2.3.4 Citation Analysis and Co-Citation Analysis**

Citation and co-citation analyses are both well-developed bibliometric methods applied to investigate the structure of scientific discipline and/or specific research areas in the information science and social science disciplines. Citation analysis is used to investigate how knowledge transfers over time in a certain discipline (Garfield 1972; Osareh 1996a; Osareh 1996b). This study applied citation analysis to examine the highly influential references cited by TAR publications.

Co-citation analysis is an extension of citation analysis. This technique is useful in addressing the communication among networks within a certain research field, providing a historical view of the intellectual structure (McCain 1986, 1990), illustrating information about the internal structure, and also suggesting the degree of fragmentation of the targeted research area (Small 1980). A co-citation exists when two parts of documents are cited in the same source document or same bibliography. The number of co-citations can be interpreted as a measure of the proximity of the source documents or their authors. Mullins et al. (1977) and McCain (1986) reported that co-citation results more reliably imply how the researchers involved are perceived compared to the results of a survey. However, the interpretation of the results has to be drawn with care as the identified networks are not groups of individuals who are linked as is the case in social network analysis. Instead, the nodes within the clusters form a group with similar and common perspectives on a certain research area or topic (Cawkell 1976; Garfield 1993). As citation frequency varied for each reference article, it was necessary to transform a co-cit score into a relative co-citation weight in order to compare the co-citation count. In other words, co-citation counts were computed first, the relative co-citation values

between any two document sources (A and B) were then transformed into a scale ranged between 0 and 1 computed by the following formula (Gmur 2003) to form the co-cit matrix (see Appendix II):

$$CoCit_{AB} = \frac{(co - citation_{AB})^2}{Minimum(citation_A; citation_B) \times mean(citation_A; citation_B)} \quad (1)$$

### Equation 1: Co-Citation Calculation

To visualize the research community and identify the research groups that formed TAR community, co-cit matrices of relative co-citation weights were uploaded to ORA<sup>10</sup> to identify TAR's intellectual network and main research clusters. The visualization of the full co-citation network is illustrated in Figure A (see Appendix II). The main research clusters that contributed to the formation of TAR research community were then identified by partitioning the full co-citation network (Tables 8, 9, and 10).<sup>11</sup>

## 2.4 RESULTS AND ANALYSIS

### 2.4.1 Research Characteristics of TAR (1994-2008)

The research characteristics of TAR publications in period 1994–2008 are analyzed by five attribute dimensions using the ARD taxonomy (i.e., research method, mode of reasoning, school of thought, accounting area, and accounting discipline). The predominant categories defined as those ranked in the top three in each taxonomic class

<sup>10</sup> ORA is a dynamic meta-network assessment and analysis tool developed by CASOS at Carnegie Mellon University. This application enables the identification of clusters and network visualization analysis of information that can be represented in a social network format (e.g., documents, texts, and methods). It has been used to examine how networks change through space and time. See: <http://www.casos.cs.cmu.edu/projects/ora/>

<sup>11</sup> This study applied a threshold to partition the network in order to determine the main research groups that formed TAR which was in line with the approach in the previous literature (Gmur 2003; Just 2010). It is worth noting that there has not yet been a consensus on the absolute threshold to select in parsing the intellectual structure in the literature: therefore, this study followed the general guidance described in previous studies with consideration of the size of the article sample and references to set the thresholds.

are shown in Tables 3, 4, 5, and 6. Descriptive statistics<sup>12</sup> including the percentages and ranking of the top taxonomic categories were illustrated by the time frame, which enabled comparisons across time periods.

#### ***2.4.1.1 Research Method***

The overall findings suggested that the research method which was applied by nearly half (48.12%) of TAR articles in the entire sample period was archival-primary. Data used in these studies were typically extracted from empirical databases (e.g., CRSP and COMPUSTAT). The ranking and percentage of the archival-primary method's usage has become higher and increased its level of importance over time. The percentage and ranking of empirical laboratory and analytical internal logic methods have only slightly changed over the 15-year period. However, there was an obvious increase in the share of first ranked method - archival-primary - suggesting that the methods applied in TAR have become less diversified and more specialized over time. Having less diversified topical areas published and narrower types of methods applied in accounting research imply that the literature published in this top accounting journal is growing within a rather narrow scope and the progress is somewhat imbalanced as a whole.

#### ***2.4.1.2 Mode of Reasoning***

Mode of reasoning, the analytical technique used to arrive at the research conclusions, is dominated by regression analysis which appeared in more than half (53.76%) of TAR articles. The quantitative analytical method was ranked in second place in all of the time

---

<sup>12</sup>The detailed results on ranking and statistics distribution of the five taxonomic categories are shown in Appendix II. Table 3-Table 7 provides a summary of the findings. The complete content classifications on all twelve taxonomic categories for TAR can be requested from authors.

periods and accounted for 12.78% over the entire period. Qualitative research published in TAR has gradually increased its share from none in the first time period to 8.62% in the third time period: it ranked in third place in the last time period. Approximately 10% of TAR studies applied more than one mode of reasoning which resulted in their classification into the mixed category.

**TABLE 3**  
**Statistical Distribution and Ranking of Research Methods**

<u>A. Research Method</u>			
<i>Ranking/Period</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Period I: 1994-1998	Archival-Secondary (33.8%)	Archival-Primary (28.87%)	Empirical Lab (17.61%)
Period II: 1999-2003	Archival-Primary (47.47%)	Empirical Lab (15.19%)	Archival- Secondary (14.56%)
Period III: 2004-2008	Archival-Primary (60.34%)	Empirical Lab (19.83%)	Analytical Internal Logic (12.5%)
<i>1994-2008</i>	<i>Archival-Primary</i> <i>(48.12%)</i>	<i>Empirical Lab</i> <i>(17.86%)</i>	<i>Analytical Internal</i> <i>Logic (13.72%)</i>

**TABLE 4**  
**Statistical Distribution and Ranking of Mode of Reasoning**

<u>B. Mode of Reasoning</u>			
<i>Ranking/Period</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Period I: 1994-1998	Quantitative Regression (47.18%)	Quantitative Analytical (16.9%)	Mixed (12.68%)
Period II: 1999-2003	Quantitative Regression (60.13%)	Quantitative Analytical (12.66%)	Mixed (11.39%)
Period III: 2004-2008	Quantitative Regression (53.45%)	Quantitative Analytical (10.34%)	Qualitative (8.62%)
<i>1994-2008</i>	<i>Quantitative Regression</i> <i>(53.76%)</i>	<i>Quantitative Analytical</i> <i>(12.78%)</i>	<i>Mixed</i> <i>(10.34%)</i>



### 2.4.1.3 School of Thought

Overall, the three schools of thought to which most TAR studies contributed were statistical modeling–efficient market hypothesis (22.56%), behavioral–human information process systems (16.17%), and statistical modeling–other (14.47%). In the comparison across the time periods, statistical modeling-based categories continued to be ranked first. The efficient market hypothesis sub-category, however, was less populated in the last period compared to the first two periods. Behavioral research increased its share over time with its ranking rising to second place in the last period.

**TABLE 5**  
**Statistical Distribution and Ranking of School of Thought**

<u>C. School of Thought</u>			
<i>Ranking/Period</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Period I: 1994-1998	Statistical Modeling EMH (37.32%)	Statistical Modeling Information Economics (23.24%)	Behavioral Hips (18.31%)
Period II: 1999-2003	Statistical Modeling EMH (26.58%)	Other (23.42%)	Accounting Theory (18.99%)
Period III: 2004-2008	Statistical Modeling Other (27.16%)	Behavioral Hips (20.26%)	Statistical Modeling EMH (10.78%)
<i>1994-2008</i>	<i>Statistical Modeling</i> <i>EMH</i> <i>(22.56%)</i>	<i>Behavioral Hips</i> <i>(16.17%)</i>	<i>Statistical Modeling</i> <i>Other</i> <i>(14.47%)</i>

### 2.4.1.4 Accounting Area

Financial accounting has been the leading research topical area in TAR publications (54.89%) in the overall 15-year period and in each of the time periods. In second and

third place were audit and managerial areas. However, less audit research has been published in TAR in the third period (2004–2008). The amount of studies that contributed to issues in multiple accounting areas, that is, research topics on integrated accounting, increased in percentage in the most recent period.

Two areas of research combined accounted for less than 10% of TAR's topical focus: tax and information systems research. Taxation-relevant research has decreased its share over time with a mere 3.02% in the third time period. In addition, information systems' studies were the area of research identified least in TAR publications over the 15-year period.

**TABLE 6**  
**Statistical Distribution and Ranking of Accounting Area**

<u>D. Accounting Area</u>			
<i>Ranking/Period</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Period I: 1994-1998	Financial (55.63%)	Audit (21.13%)	Managerial (13.38%)
Period II: 1999-2003	Financial (51.9%)	Audit (22.78%)	Managerial (15.19%)
Period III: 2004-2008	Financial (56.47%)	Managerial (15.95%)	Audit (15.09%)
<i>1994-2008</i>	<i>Financial</i> (54.89%)	<i>Audit</i> (18.98%)	<i>Managerial</i> (15.04%)

#### **2.4.1.5 Foundation Discipline**

The main disciplines in which TAR studies were grounded were the accounting (45.68%), economics and finance (29.89%), and psychology (9.4%) domains. Theories grounded in accounting have been TAR's first-ranked category over the full analysis period. Theories in economics and finance have increased their importance to TAR

researchers in the past decade: the share has increased from 9.01% in the first period to 29.89% in the third period, with this finding agreeing with previous literature. Literature grounded in psychology accounted for nearly 10% of the publications over the entire time period. In the third time period, literature grounded in both the sociology, political science, and philosophy disciplines sub-category and the psychology sub-category appeared as third-ranked. Overall, findings in this category implied that the underlying theories have been drawn from a more diversified set of disciplines over time.

**TABLE 7**  
**Statistical Distribution and Ranking of Foundation Discipline**

<u>E. Foundation Discipline</u>			
<i>Ranking/Period</i>	<i>1st</i>	<i>2nd</i>	<i>3rd</i>
Period I: 1994-1998	Accounting (63.38%)	Economics & Finance (19.01%)	Psychology (9.86%)
Period II: 1999-2003	Accounting (37.34%)	Economics & Finance (33.54%)	Psychology (12.03%)
Period III: 2004-2008	Accounting (40.95%)	Economics & Finance (34.05%)	Psychology/ Sociology, Political Science, Philosophy (7.33%)
<i>1994-2008</i>	<i>Accounting</i> <i>(45.86%)</i>	<i>Economics &amp; Finance</i> <i>(29.89%)</i>	<i>Psychology</i> <i>(9.4%)</i>

#### ***2.4.1.6 Summary of Content Analysis Results***

Overall, our results suggest that recent TAR publications were built upon theories from the accounting discipline. The predominant topical area that interested TAR researchers over the entire 15-year period was financial accounting. In terms of schools of thought, most TAR research contributed to statistical-based modeling. The archival-primary

research method and quantitative regression technique were both heavily applied in TAR research.

In addition, our findings also suggest that the qualitative research and behavioral areas have both increased their share in TAR research over time. Other noteworthy implications are that research methods applied in TAR have become more specialized or narrower in scope. In contrast, the range of theories found to ground the research used in TAR studies was wider.

#### **2.4.2 TAR Citation Analysis and Co-Citation Clustering**

To identify the research clusters that led to the formation of the recent TAR community and to shed light on the evolution of scholarly communication, citation and co-citation analyses were used to examine bibliographies for every five years in the three time sub-periods: 1994–1998, 1999–2003, and 2004–2008. This section illustrates and elaborates upon the identified research clusters in each period and then provides a comparison of the longitudinal results to conclude the study.

##### ***2.4.2.1 Period I: 1994 – 1998***

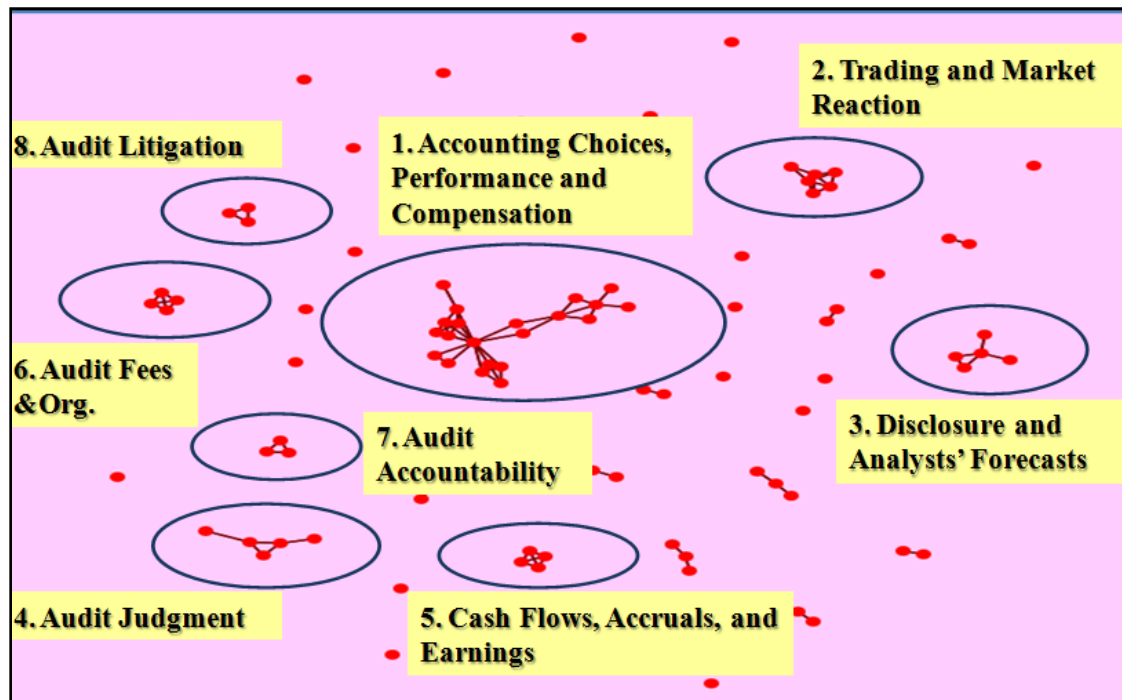
In period I, eight main research clusters were identified in the co-citation network (Figure 1). The clusters were labeled based on their sizes, and named according to their identified research method and content after a step in which they were categorized (see Appendix II). The largest cluster in this time period fell into the group of research on **accounting choices, performance, and compensation**, which is seen in the middle of the co-citation graph (Figure 1) and contained 21 reference nodes (Table 8). The identified central or core nodes with the highest linkage weight and that held the network structure together

were *Healy 1985*, *DeAngelo 1986*, *Press 1990*, and *Skinner 1993*. Cluster #1 was relatively large: this financial accounting group can be viewed as a combination of three sub-clusters of references, based on the strength of the linkage weights. The first sub-cluster located at the right-hand part of the network consisted of six references: its topical area was accounting choices/accounting standards in financing. The two bridging articles that held the right-hand and left-hand parts of the graph together were focused on the relationship between executive behavior and firm performance. On the left-hand side of the network, the contracting and executive compensation research cluster was identified: it consisted of 13 bibliographies with *Healy 1985* positioned at the center of this group.

**Trading and market reaction** was the topical area of the second largest research cluster, which comprised six articles with *Ajinkya 1991* as the core of the group. This was yet another cluster that focused on financial accounting; however, what differentiated this group from the previous one was the research methods employed. The quantitative analytical reasoning method was utilized in this group of studies, while archival data and quantitative regression methods were utilized in cluster #1. The third cluster consisted of five articles with *King 1990* central in the structure. The research method employed, main accounting area, and foundation discipline of focus were similar to those in cluster #1: the cluster topic was on **disclosures and analysts' forecasts**.

**Audit judgment** was the main theme of cluster #4. Articles by *Libby 1985* and *Frederick 1991* were the references that centered this group and linked strong to the remaining three references. This stream of studies focused on auditor behavior and judgmental decisions. The empirical laboratory and psychology approaches were found to be the most commonly used.

**FIGURE 1**  
**Period I 1994-1998\*: Co-citation Clusters**

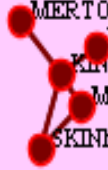
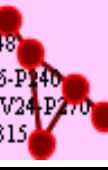
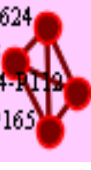
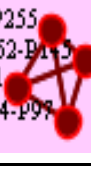


\*See Appendix II for the full co-citation network of 1994-1998.

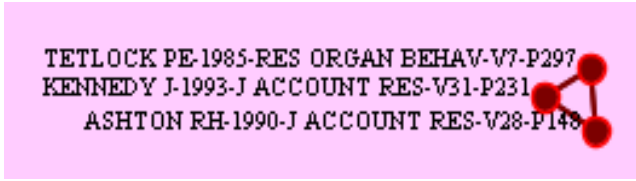
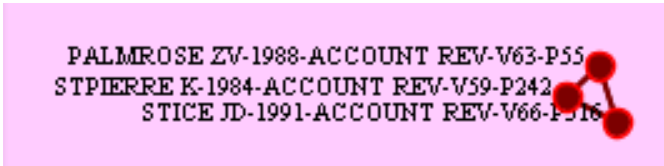
Cluster #5 was another group in the financial accounting area: the specific focus was on **cash flow, accrual, and earning** measures of firms' performance. These references were grounded in the accounting, economics, and finance literature. Archival primary data and statistical modeling methods were often applied to examine these research topics. The remaining three clusters are centered on auditing area with focus on **audit fees and organizations, audit accountability** and **audit litigation**. Grounding theories for these clusters were drawn from the accounting, psychology, and law disciplines. While the topic interests were different among these, the audit accountability cluster shared a common research method and school of thought with cluster #4 (audit judgment). Audit litigation, and audit fees and organizations clusters both employed the statistical modeling method for analyzing archival data. Audit litigation was the only cluster among the eight that built theories and research using theories from the law discipline.

**TABLE 8**  
**Period I: Main Clusters in the Co-Citation Network**

Topical Area	<u>Group 1*- Accounting Choices, Performance, and Compensation</u>
Cluster	
Ref.	<p>Sub-group 1-1: Accounting Choices/Standards in Financing [Right]  Bowen 1981, Zmuewski 1981, Press 1990, Duke 1990, Skinner 1993 and Gaver 1993.</p> <p>Sub-group 1-2: Executives Behavior on Firm Performance [Middle]  Antle 1986 &amp; Sweeney 1994.</p> <p>Sub-group 1-3: Contracting/Executive's Compensation [Left]  Watts 1978, Healy 1985, DeAngelo 1986, Watts 1986, Healy 1987, Lambert 1987, McNichols 1988, Defer 1989, Schipper 1989, Watts 1990, Christie 1990, Jones 1991, and Sloan 1993.</p>
Central Node	Healy 1985, DeAngelo 1986, Press 1990, and Skinner 1993.
Topical Area	<u>Group 2- Trading and Market Reaction</u>
Cluster	
Ref.	Karpoff 1986, Ajinkya 1991, Kim 1991, Kim 1994, Atiase 1994, and Abarbanell 1995.
Central Node	Atiase 1994.

Topical Area	<u>Group 3- Disclosures &amp; Analysts' Forecasts</u>
Cluster	 <p>MERTON RC-1987-J FINANC-V42-P483  LANG M-1993-J ACCOUNT RES-V31-P246  KING R-1990-J ACCOUNT LIT-V9-P113  MCNICHOLS M-1989-ACCOUNT REV-V64-P1  SKINNER DJ-1994-J ACCOUNT RES-V32-P38</p>
Ref.	Merton 1987, McNichols 1989, Lang 1993, King 1990, and Skinner 1994.
Central Node	King 1990.
Topical Area	<u>Group 4- Audit Judgment</u>
Cluster	 <p>BUTLER SA-1985-J ACCOUNT RES-V23-P513  LIBBY R-1985-J ACCOUNT RES-V23-P648  FREDERICK DM-1991-ACCOUNT REV-V66-P140  FREDERICK DM-1986-J ACCOUNT RES-V24-P270  BUTT JL-1988-J ACCOUNT RES-V26-P315</p>
Ref.	Butler 1985, Libby 1985, Frederick 1986, Butt 1988, and Frederick 1991.
Central Node	Libby 1985 and Frederick 1991
Topical Area	<u>Group 5- Cash Flow, Accrual &amp; Earning</u>
Cluster	 <p>BERNARD VL-1989-ACCOUNT REV-V64-P624  DECHOW PM-1994-J ACCOUNT ECON-V18-P3  RAYBURN J-1986-J ACCOUNT RES-V24-P112  WILSON GP-1986-J ACCOUNT RES-V24-P165</p>
Ref.	Rayburn 1986, Wilson 1986, Benard 1989, and Dechow 1994.
Topical Area	<u>Group 6- Audit Fees and Organizations</u>
Cluster	 <p>SIMON DT-1988-ACCOUNT REV-V63-P255  FRANCIS JR-1987-ACCOUNT REV-V62-P113  SIMUNIC DA-1980-J ACCOUNT RES-V18-P161  PALMROSE ZV-1986-J ACCOUNT RES-V24-P98</p>
Ref.	Simunic 1980, Palmrose 1986, Francis 1987 and Simon 1988.



Topical Area	<u>Group 7- Audit Accountability</u>
Cluster	 <p>TETLOCK PE-1985-RES ORGAN BEHAV-V7-P297 KENNEDY J-1993-J ACCOUNT RES-V31-P231 ASHTON RH-1990-J ACCOUNT RES-V28-P148</p>
Ref.	Tetlock 1985, Ashton 1990, and Kennedy 1993.
Topical Area	<u>Group 8- Audit Litigation</u>
Cluster	 <p>PALMROSE ZV-1988-ACCOUNT REV-V63-P55 STPIERRE K-1984-ACCOUNT REV-V59-P242 STICE JD-1991-ACCOUNT REV-V66-P516</p>
Ref.	Stpierre 1984, Palmrose 1988, and Stice 1991.

\* See Appendix II for detailed bibliography information.

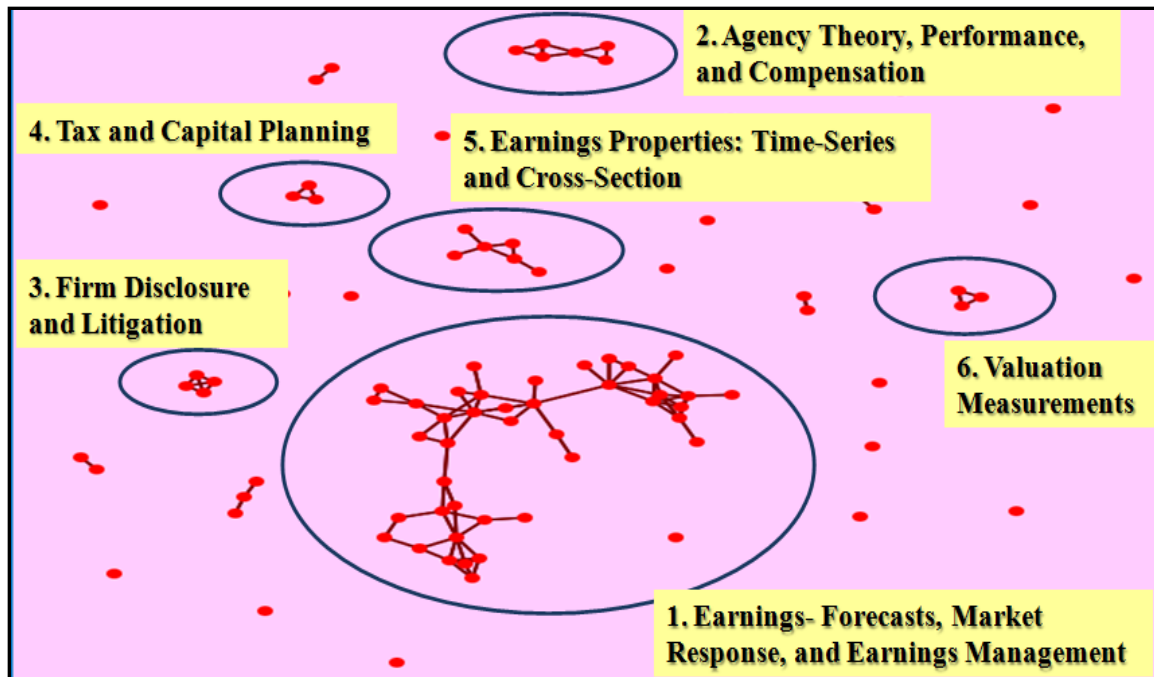
#### ***2.4.2.2 Period II: 1999 – 2003***

The six main clusters identified in period II (Figure 2) were: 1) earnings - forecasts, market response and earnings management; 2) agency theory, performance, and compensation; 3) firm disclosures and litigation; 4) tax and capital planning; 5) earnings properties: time-series and cross-section; and 6) valuation measurements. Each cluster's attributes are discussed in the following sections.

The largest cluster identified in this period was the **earnings - forecasts, market response, and earnings management** group which was a financial accounting cluster. As in period I, cluster#1 appeared to be significantly larger than the remaining clusters: it could be viewed as comprising three sub-groups. The right-hand part was formed by a group of studies titled “market response to earnings” with *Bernard 1989*, *Freeman 1989*,

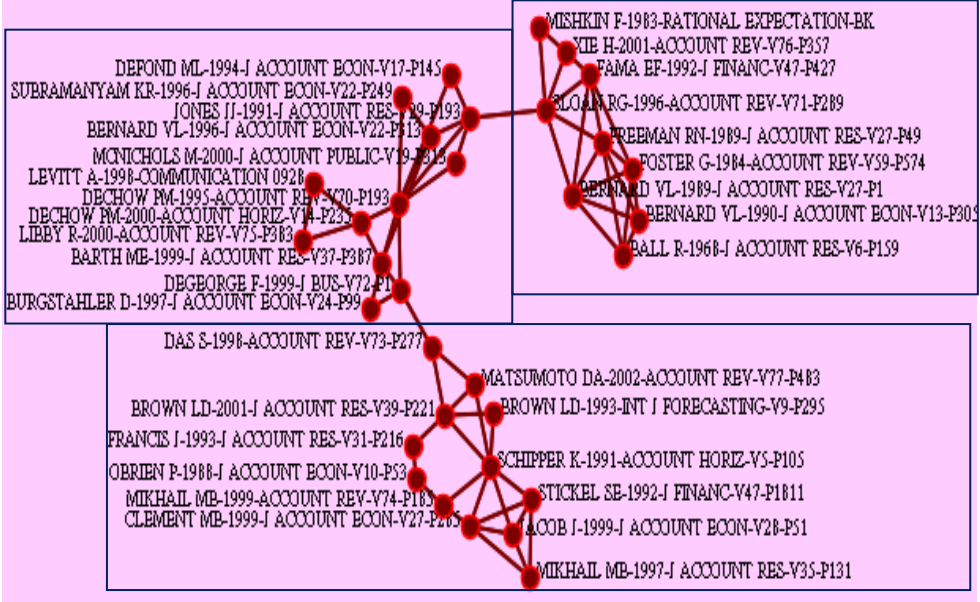
and *Sloan 1996* as the center nodes. *Dechow 1995* was the core of the middle sub-group, which focused on discretionary accruals and earnings management research issues (Table 9). The literature on analysts' earnings forecasts was the topical area of the bottom subgroup with *Schipper 1991* centered as the core reference. Other characteristics that could be implied from the largest cluster were that archival primary/secondary data were used and that the analysis was performed by quantitative and statistical modeling techniques: the theory was mainly drawn from the accounting discipline. Another smaller cluster that was closely related to this cluster was the **earnings properties: time-series and cross-section** group (cluster #5). This cluster shared very similar attributes to cluster #1, that is, the grounding theory and reasoning methods applied were common to both: the topical focus issue was however slightly different. This knowledge cluster analyzed earnings and the relevant market response through either a longitudinal or cross-sectional aspect.

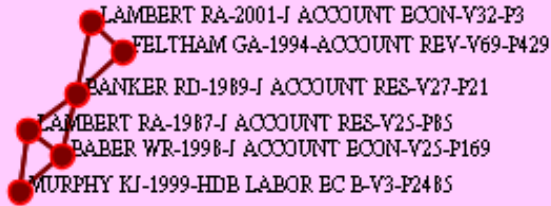
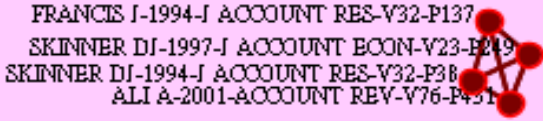
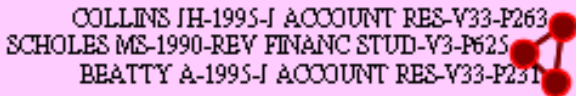
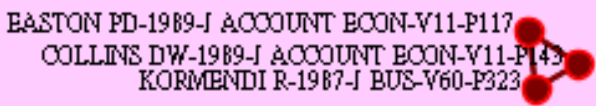
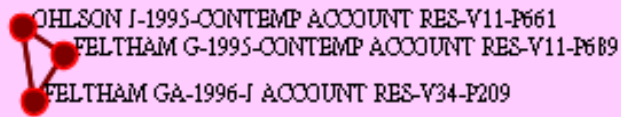
**FIGURE 2**  
**Period II 1999-2003: Co-Citation Clusters**



Cluster #2 fell under the managerial accounting topical area, with the emphasis on **agency theory, performance, and compensation**. The six articles contained in this cluster centered on *Banker 1989*, a reference published in JAR. This cluster of references was grounded in economics, finance, and accounting theory, used internal logic and analytical research methods, and contributed to the information economics domain. **Firm disclosures and litigation** formed cluster #3 with four relevant articles and was yet another group focused on the financial accounting area. This research cluster used archival secondary data and performed analysis on the two-way relationship between information structure/disclosure and lawsuits using the quantitative statistical modeling approach.

**TABLE 9**  
**Period II: Main Clusters in Co-Citation Network**

Topical Area	Group 1*- Earnings- Forecasts, Market Response, and Earnings Management
Cluster	
Ref.	<p>Sub-group 1-1: Market Response to Earnings [Right]  Ball 1968, Mishkin 1983, Foster 1984, Bernard 1989, Freeman 1989, Benard 1990, Fama 1992, Sloan 1996 and Xie 2001.</p> <p>Sub-group 1-2: The Roles of Discretionary Accruals &amp; Earnings Management [Upper Left]  Jones 1991, Defond 1994, Dechow 1995, Subramanyam 1996, Bernard 1996, Burgstahler 1997, Levitt 1998, Barth 1999, Degeorge 1999, Dechow 2000, Libby 2000 and McNichols 2000.</p> <p>Sub-group 1-3: Analysts' Earnings Forecast [Bottom]  Obrien 1988, Schipper 1991, Stickel 1992, Brown 1993, Francis 1993, Mikhail 1997, Das 1998, Clement 1999, Jacob 1999, Mikhail 1999, Brown 2001 and Matsumoto 2002.</p>
Central Node	Right: Dechow 1995; Middle Left: Bernard 1989, Freeman 1989, Sloan 1996; Middle Bottom: Schipper 1991.

Topical Area	<u>Group 2- Agency Theory, Performance, and Compensation</u>	
Cluster		
Ref.	Lambert 1987, Banker 1989, Feltham 1994, Baber 1998, Murphy 1999 and Lambert 2001.	
Central Node	Banker 1989.	
Topical Area	<u>Group 3- Firm Disclosure and Litigation</u>	
Cluster		
Ref.	Francis 1994, Skinner 1994, Skinner 1997 and Ali 2001.	
Topical Area	<u>Group 4- Tax and Capital Planning</u>	
Cluster		
Ref.	Scholes 1990, Collins 1995 and Beatty 1995.	
Topical Area	<u>Group 5- Earnings Properties: Time-Series and Cross-Section</u>	
Cluster		
Ref.	Kormendi 1987, Easton 1989 & Collins 1989.	
Topical Area	<u>Group 6- Valuation Measurements</u>	
Cluster		
Ref.	Ohlson 1995, Feltham 1995 & Feltham 1996.	

\* See Appendix II for detailed bibliography information.

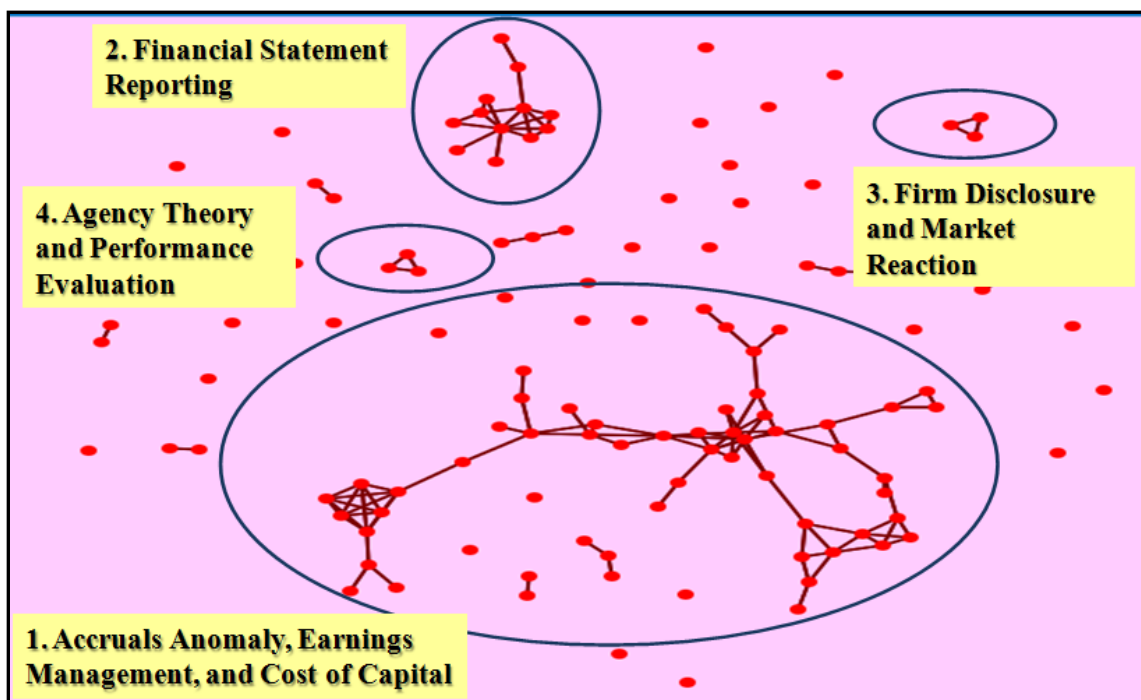
Cluster #4 focused on the **tax and capital planning** topic area. This group of the literature examined tax planning and capital planning as well as reporting strategies in the different contexts. The three articles shared attributes similar to those in cluster #3 in terms of research methods and foundation discipline. Last but not least, the **valuation measurements** cluster was identified as a group that contained three reference articles. These studies used theories from accounting, economics, and finance with the application of quantitative analytical reasoning and statistical modeling approaches to examine how various measurements on financial statements contributed to the valuation of firms' performance. In summary, among the six reference clusters identified in this second time period, the findings suggested that the areas of references cited in TAR research were predominantly in financial accounting research, which could be broken down into five clusters; the remaining cluster was a managerial accounting bibliography group.

#### ***2.4.2.3 Period III: 2004 – 2008***

Four main research clusters were identified in period III (Figure 3). The largest cluster, cluster #1, was centered on **accruals anomaly, earnings management, and cost of capital research** (Table 10). As in the approach used in periods I and II, cluster #1 could be broken down into four sub-clusters by cross-referencing article classifications in the *Accounting Research Directory* (1985, 1994). The upper sub-cluster contained six references that were centered on *Rangan 1998*. This cluster focused on earnings management's effect on firm's performance. The middle sub-group focused on the role of accruals anomaly and earning management with *Jones 1991*, *Dechow 1995*, and *Hribar 2002* centered in the cluster. The bottom right-hand section was centered by *Beasley 1996* and *Klein 2002* on the relationship between earnings management, auditing, and

corporate governance, while the bottom left-hand section was centered by *Botosan 1997* and *Gebhardt 2001* on the level of disclosure and the cost of equity capital. Regarding the cluster attributes, cluster #1 mainly utilized archival primary data and applied quantitative regression methods. The main research area was financial accounting: these references contributed to the statistical modeling and accounting theory schools of thought.

**FIGURE 3**  
**Period III 2004-2008: Co-Citation Clusters**



The topical area of cluster #2 was on **financial statement reporting**. This reference group contained eight nodes in which *Maines 2000* was the main reference that centered the structure. This stream of literature applied empirical laboratory and quantitative research methods to investigate financial statement's information structures, disclosures, and analysts stock price judgments. It contributed to the behavioral school of thought and the financial accounting area.

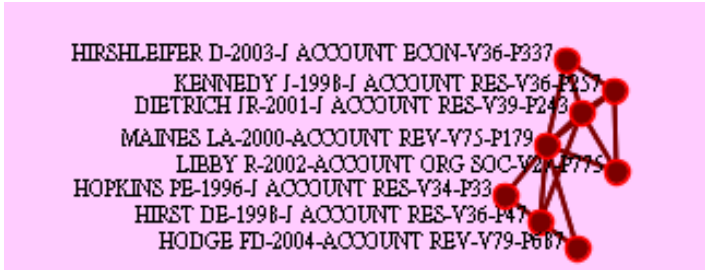
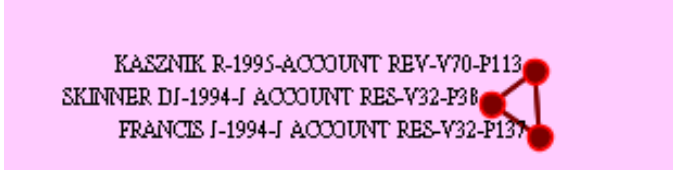
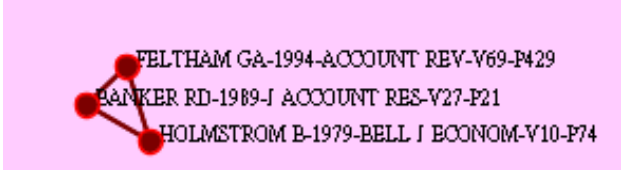
**Firm disclosures and market reaction** research was the topic area of cluster #3. This small cluster consisted of three references that conducted research by applying the quantitative regression method to archival secondary data. Financial accounting was once again the topical area of focus. Specifically, these studies targeted the analysis of the information structure and the net income/earnings per share disclosed on statements.

**Agency theory and performance evaluation** was the topic area of the last cluster. This group of research was centered on the managerial accounting area and was the only non-financial accounting cluster identified in the last time period. Similar to cluster #3 in size, this was a relatively minor cluster containing only three references: one of which—*Holmstrom 1979*—continues to be well regarded in the field as one of the building blocks the development of agency theory in managerial accounting research. This cluster contributed to the information economics school and used theoretical/analytical approaches to examine research ideas on executive compensation and performance evaluation research issues linked to agency theory.



**TABLE 10**  
**Period III: Main Clusters in Co-Citation Network**

Topical Area	Group 1*- Accruals Anomaly, Earnings Management, and Cost of Capital
Cluster	<p>TEOH SH-1998-J FINANC-V53-P1935  SHIVAKUMAR L-2000-J ACCOUNT ECON-V29-P339  RANGAN S-1998-J FINANC ECON-V50-P101  TEOH SH-1998-J FINANC ECON-V50-P63  SWEENEY AP-1994-J ACCOUNT ECON-V17-P281  JENSEN MC-1976-J FINANC ECON-V3-P305  MCNICHOLS M-2000-J ACCOUNT PUBLIC-V19-P313  DECHOW PM-2002-ACCOUNT REV-V77-P95  KOTHARI SP-2005-J ACCOUNT ECON-V39-P163  DEFOND ML-1998-J ACCOUNT ECON-V25-P37  HRIBAR P-2002-J ACCOUNT RES-V40-P105  XIE H-2001-ACCOUNT REV-V76-P357  FAMA EF-1973-J POLITICAL EC-V81-P607  FAMA EF-1993-J FINANC ECON-V23-P9  SLOAN RG-1996-ACCOUNT REV-V71-P289  FAMA EF-1992-J FINANC-V47-P427  CLAUS J-2001-J FINANC-V56-P1629  BOTOSAN CA-1997-ACCOUNT REV-V72-P323  GEBHARDT WR-2001-J ACCOUNT RES-V39-P113  BOTOSAN CA-2002-J ACCOUNT RES-V40-P21  GODE D-2003-REV ACCOUNT STUD-V18-P173  EASTON PD-2004-ACCOUNT REV-V79-P73  DEFOND ML-1994-J ACCOUNT ECON-V17-P145  ABOODY D-2000-ACCOUNT ECON-V29-P73  JONES JJ-1991-J ACCOUNT RES-V29-P193  BENISH MD-1999-ACCOUNT REV-V74-P425  DECHOW PM-1995-ACCOUNT REV-V70-P199  FEROZ EH-1991-J ACCOUNT RES-V29-P131  CHUNG HS-2003-ACCOUNT REV-V77-P431  BEASLEY MS-1996-ACCOUNT REV-V71-P443  DECHOW PM-2000-ACCOUNT REV-V71-P443  FRANKEL RM-2002-ACCOUNT REV-V77-P21  KLEIN A-2002-J ACCOUNT ECON-V33-P375  FRANCIS JR-1999-AUD J PRACT TH-V18-P17  BECKER C-1998-CONTEMP ACCOUNT RES-V15-P1</p>
Ref.	<p>Sub-group 1-1:The Effect of Earning Management on Firm Performance [Upper Part]  Jensen 1976, Sweeney 1994, Rangan 1998, Teoh 1998, Teoh 1998 and Shivakumar 2000.</p> <p>Sub-group 1-2:The Roles of Discretionary Accruals &amp; Earnings Management [Middle Part]  Fama 1973, Jones 1991, Fama 1992, Defond 1994, Dechow 1995, Sloan 1996, Defond 1998, Aboody 2000, Dechow 2000, McNicholas 2000, Xie 2001, Dechow 2002, Hribar 2002, Chung 2003, Kothari 2005.</p> <p>Sub-group 1-3:The Relationship between Earning Management, Auditing, and Corporate Governance [Bottom Right Part]  Feroz 1991, Beasley 1996, Dechow 1996, Becker 1998, Benish 1999, Francis 1999, Frankel 2002 and Klein 2002.</p> <p>Sub-group 1-4:Disclosure Level &amp; Cost of Equity Capital [Bottom Left Part]  Fama 1992, Botosan 1997, Claus 2001, Gebhardt 2001, Botosan 2002, Gode 2003, Easton 2004.</p>
Central Node	Upper: Rangan 1998; Middle: Jones 1991, Dechow 1995 and Hribar 2002; Bottom Right: Beasley 1996 and Klein 2002; Bottom Left: Botosan 1997, Gebhardt 2001.

Topical Area	<u>Group 2- Financial Statement Reporting</u>
Cluster	 <p>             HIRSHLEIFER D-2003-J ACCOUNT ECON-V36-P337              KENNEDY J-1998-J ACCOUNT RES-V36-P257              DIETRICH JR-2001-J ACCOUNT RES-V39-P243              MAINES LA-2000-ACCOUNT REV-V75-P179              LIBBY R-2002-ACCOUNT ORG SOC-V24-P775              HOPKINS PE-1996-J ACCOUNT RES-V34-P33              HIRST DE-1998-J ACCOUNT RES-V36-P47              HODGE FD-2004-ACCOUNT REV-V79-P667           </p>
Ref.	Hopkins 1996, Hirst 1998, Kennedy 1998, Maines 2000, Dietrich 2001, Libby 2002, Hirshleifer 2003 and Hodge 2004.
Central Node	Maines 2000.
Topical Area	<u>Group 3- Firm Disclosures and Market Reaction</u>
Cluster	 <p>             KASZNIK R-1995-ACCOUNT REV-V70-P113              SKINNER DJ-1994-J ACCOUNT RES-V32-P38              FRANCIS J-1994-J ACCOUNT RES-V32-P137           </p>
Ref.	Francis 1994, Skinner 1994 & Kasznik 1995.
Topical Area	<u>Group 4- Agency Theory and Performance Evaluation</u>
Cluster	 <p>             FELTHAM GA-1994-ACCOUNT REV-V69-P429              BANKER RD-1989-J ACCOUNT RES-V27-P21              HOLMSTROM B-1979-BELL J ECONOM-V10-P74           </p>
Ref.	Holmstrom 1979, Banker 1989 & Feltham 1994.

\* See Appendix II for detailed bibliography information.

## 2.5 CONCLUSION

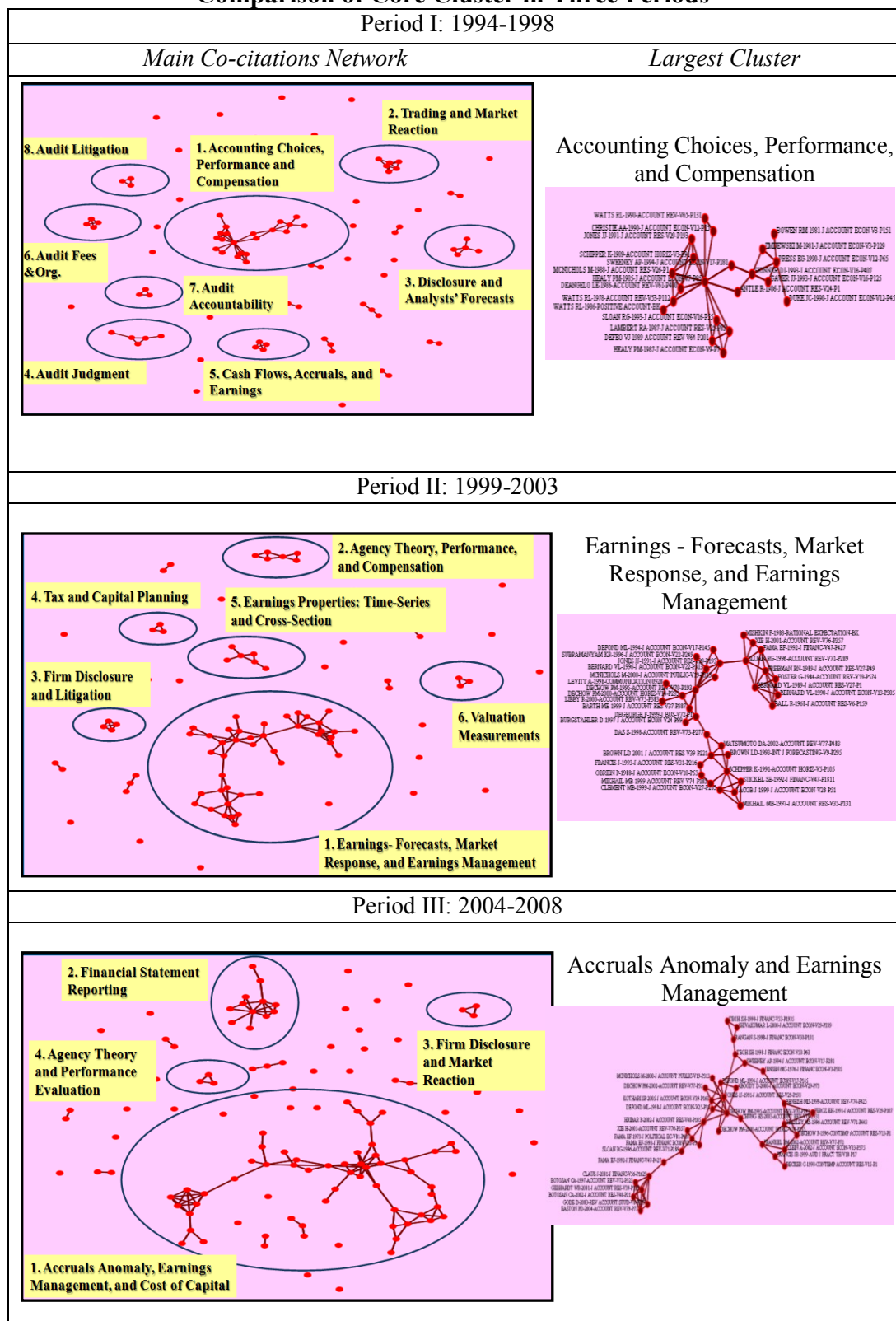
The purpose of this study was to examine the characteristics development of leading academic research published in TAR from 1994 to 2008 and to reveal the intellectual structure of TAR community. In line with the literature of accounting thought development and information science, this study applied bibliometrics to address three main research questions on TAR's research content and its citations' knowledge clusters that had led to its contribution to the accounting field. In summary, our findings suggest that research published in TAR mainly centered on the financial accounting area, with its foundation built upon accounting theory and with economics and finance theories ranked in second place. Statistical modeling on the efficient market hypothesis was the category to which most TAR studies contributed in the taxonomic class - school of thought. The archival-primary and quantitative-regression methods were the most popular applied research methods and reasoning techniques used in TAR.

On the development of intellectual structure, the findings of the co-citation analysis for the first time period (1994–1998) identified eight research clusters that had made a contribution to forming TAR publications. The topics of the reference clusters identified in this period were relatively more diversified than those of other time periods. The largest cluster was centered on accounting choices, performance and compensation. There were clusters in auditing, tax and managerial topic areas. In period II (1999–2003), six clusters were identified which were 1) earnings - forecasts, market response and earnings management; 2) agency theory, performance, and compensation; 3) firm disclosures and litigations; 4) tax and capital planning; 5) earnings properties: time-series and cross-section, and 6) valuation measurements. In the third period (2004–2008), the

main cluster of references that influenced TAR publications the most fell under the earnings forecasts, market response, and earnings management areas of bibliographies. Of the four clusters identified in the third period (2004–2008), the largest research cluster focused on accruals anomaly and earnings management issues. Results suggested that, for the period of 2004–2008, the four main research group clusters that appeared to influence research in TAR were mainly on financial accounting topics. The dominant research methods and attributes applied in these streams of research were archival primary data, and empirical and quantitative statistical methods.

The size of the largest research cluster has increased over time (Table 11). However, the total number of main clusters identified in each period decreased during these years. Implications that can be drawn from this finding are that the leading accounting research published in TAR has apparently been deepening its expertise in certain accounting research areas (e.g., financial accounting) more than other areas (e.g., tax or managerial accounting). The research contributions of TAR publications are seemingly becoming less diversified in terms of the areas of contribution to accounting. At the same time, some areas of accounting are reaching a level of maturity more significantly than others (e.g., earnings-relevant topics). This implication is arrived at by viewing the clusters' structure and the characteristics of references identified within.

**TABLE 11**  
**Comparison of Core Cluster in Three Periods**



From the perspective of research characteristics, the findings also revealed that the qualitative research method and behavioral school of thought have both been gradually increasing their share in TAR. The applied research methods appear to have become more specialized or narrower in scope, while foundation discipline results imply that theories have been borrowed from a more diversified set of domains. In comparison with other fields, the accounting discipline has not yet fully utilized bibliometrics to quantitatively examine the nature and structure of research development to its full potential. This study aimed to examine the leading research contributions of TAR by applying content analysis, citation analysis, and co-citation analysis techniques. To our knowledge, this is the first study to fill this void in the accounting literature. The few limitations are that our results are not generalizable to research development in other domains and that it does not infer the research progression in other periods. Future research could build on this research to explore the advancement in leading accounting research over a broader time frame and comparing these results with our findings.

The main contribution of our study lies in presenting a thorough longitudinal analysis on the recent intellectual development of TAR in light of the concerns regarding the progression, diversity, and innovation issues of the accounting scholarship (Hopwood 2007; McCarthy 2012; Waymire 2012). We expect our findings to reveal more concrete understanding of the leading accounting research, to support and be value-added to TAR editorials (e.g., Kachelmeier 2009, 2010, 2011; Evans 2012) and to eventually help stimulate more conversations on the possible transformation and future directions of accounting research and education.

## CHAPTER 3

### THE DEVELOPMENT AND INTELLECTUAL STRUCTURE OF CONTINUOUS AUDITING RESEARCH

#### 3.1 OVERVIEW

This essay examines the development, research characteristics and intellectual structure of continuous auditing research in the accounting and accounting information systems disciplines. Within the audit profession, external auditors assure the adequacy of financial statements in accordance with Generally Accepted Accounting Principles (GAAP), internal auditors audit operations relative to risk management, internal control and governance processes to assure effectiveness and efficiency (IIA 2000). Advances in technology, such as the advent of the internet and the electronization of business processes, are significant forces affecting many aspects of the accounting profession (AICPA 1998; Kogan et al. 1999; Vasarhelyi 2002). With these technological advancements, both academia and the accounting profession are giving attention to the subsequent demand and opportunity for audit tasks to be performed automatically, continuously, or in nearly real time.

Although continuous auditing emerged in the 80s, it was not until the following decade that its methodology, elements, and scope began to mature. Kogan et al. (1999) viewed continuous auditing as *"a type of auditing that produces audit results simultaneously with, or a short period of time after, the occurrence of relevant events."* In AICPA/CICA (1999), continuous auditing is defined as *"a methodology that enables independent auditors to provide written assurance on a subject matter, for which an*

*entity's management is responsible, using a series of auditors' reports issued virtually simultaneously with, or a short period of time after, the occurrence of events underlying the subjects matter."* Rezaee et al. (2002) described continuous auditing as *"a comprehensive electronic audit process that enables auditors to provide some degree of assurance on continuous information simultaneously with, or shortly after, the disclosure of the information."*

Since the late 1980s, auditing researchers have been proposing theoretical principles, conceptual frameworks and development modules that illustrate the potential for continuous auditing (e.g., Groomer and Murthy 1989; Vasarhelyi and Halper 1991; Kogan et al. 1999). In the following decade, studies emphasized the need for a frequent/continuous based audit, and the grounds and components of continuous auditing gradually developed in conjunction with the expansion of research. In the most recent decade, numerous studies examine topics on enabling technologies that facilitate continuous auditing.

Research has been evaluating the costs, benefits, and further research opportunities for continuous auditing (Alles et al. 2002; Rezaee and Sharbatoghlie 2002; Alles et al. 2008). There is growing fruitful feedback from preliminary and partial implementations of continuous auditing within systems and processes which has contributed to reinforcing the importance of this research area. Auditing has been evolving substantially by progressively utilizing the latest technologies to improve process and procedure efficiency and effectiveness. In the near future, continuous auditing is expected to be more widely implemented in both internal and external audit practices (Byrnes et al. 2012).



This study aims to review key research contributions in continuous auditing in three parts. The first section of this article provides an overview of the emergence and growth of continuous auditing research in the literature since the late 1980s. The second fold of the study examines the research characteristics of continuous auditing literature by applying a content analysis approach. The third segment reveals influential continuous auditing manuscripts in the accounting discipline as well as the intellectual structure of continuous auditing research via citation and co-citation analyses. Overall, this study sheds light on and contributes to examining the emergence and development of the continuous auditing research community.

### **3.2 A REVIEW OF CONTINUOUS AUDITING RESEARCH**

#### **3.2.1 The Emergence of Continuous Auditing: Electronic Data Processing and Audit Automation**

“Technological advances are significant forces affecting the accounting profession” (AICPA 1998). The evolution of data processing technologies such as accounting database systems, data networks, electronic data interchange (EDI), transaction-driven systems, and telecommunications triggered the transformation of audit techniques in adaptation to the changing environment. Cash et al. (1977) discussed and classified several audit techniques with or without computer assistance. The study reviewed literature on auditing within the electronic data processing system environment. Vasarhelyi (1984) examined the evolution of audit processes in light of automation. He stated that computer audit implementations did not fully leverage automation benefits

because these approaches only reflected direct computerization of manual methods rather than a reanalysis and redesign of the associated processes.

Garsombke and Tabor (1986) focused on the factors for applying electronic data processing (EDP) audit techniques and their usage in performing different audit tasks. A number of articles relative to computer-based accounting systems, EDP-auditing, and other computer information science areas relevant to accounting were reviewed by Amer et al. (1987). The emergence of electronic data interchange (EDI) brought auditing to a new stage by increasing the efficiency in both external and internal audit domains (Hansen and Hill 1989; Morris and Pushkin 1995). In external auditing, Groomer and Murthy (1989) proposed an approach to continuously capture information of audit significance by applying Embedded Audit Modules (EAM) in the audit process. In essence, they demonstrated that EAM could serve as an audit tool for substantive and compliance testing.

Traditionally, financial statements are audited months after the occurrence of reported business activities. As technology evolves, the timeliness, efficiency and appropriateness of traditional audit procedures have been largely questioned in the academic literature. An increasing demand for implementing new technology to aid in the performance of audit tasks has been noted (Vasarhelyi 1983). Audit tasks have been shifting toward using new approaches that feature elements such as electronic business processes, online audit capabilities, and real-time assurances.

Continuous auditing provides for assurances on financial statements and business processes to be performed on a more frequent basis. In addition to the demand for

continuous audit of financial statements, demand and potential for other continuous auditing services have arisen including a) continuous assurance regarding the authenticity, integrity, and non repudiation of electronic commerce transactions; b) continuous assurance on controls over electronic commerce systems, compliance with debt covenants, and security of web sites containing reports on significant decision-making information; c) continuous assurance on specific financial information, and mutual fund unit values, including assurance on effective controls over the unit-holder system; d) continuous assurance regarding marketing information, media ratings, hits on websites, and banner downloads (AICPA/CICA 1999).

These aforementioned non-traditional audit services require updated standards, skills, and methodologies in order to be performed by auditors (Vasarhelyi 2002). Attention has been drawn to this wide open continuous auditing research field and it has grown extensively over the past decade. Multiple research streams have explored continuous auditing in terms of its 1) grounding theory, framework, and elements; 2) enabling technologies, forces of assistance, value and necessity of continuous monitoring and reporting, and 3) applications and implementation experiences. The field is growing and expanding in a number of directions which will be illustrated in more specific detail later in this study.

### **3.2.2 Demanding and Promoting Real-time Reporting and Assurance**

Traditional auditing has been affected by the evolution of management information systems (MIS), thus creating a new set of audit issues. The need for stakeholders to obtain more timely information as well as assurances pertaining to the integrity of that

information has expanded. Vasarhelyi and Halper (1991) introduced the Continuous Process Auditing System (CPAS), a system implemented at AT&T Bell Laboratories and developed to monitor, measure, and audit a large paperless real-time system for the internal audit organization. Kogan et al. (1999) presented a research agenda discussing several aspects of continuous online auditing (COA). The study viewed the online computer system, which permanently connects both auditees and auditors through computer networking, as a prerequisite for implementation of continuous auditing. The importance of fully automating the process to access relevant events and outcomes, and the evaluation of technological and economic feasibility of continuous online auditing were discussed.

Obtaining real-time financial information is one of the most important goals for the development of new technology applications for business processes. As information technology advances, data transmission and online real-time financial reporting becomes less costly, faster, and more feasible. For instance, financial information and audit evidence in electronic format can be provided under real-time accounting systems (RTA), financial disclosures can be presented on the Internet in HTML format, and the eXtensible Business Reporting Language (XBRL) taxonomy can be used to present financial statements enhancing their usability in various moments (Rezaee et al. 2000; Rezaee and Hoffman 2001; Bovee et al. 2002; Rezaee et al. 2002; Bovee et al. 2005).

The demand for timely continuous assurance becomes more urgent with the progressive transition from traditional financial statement reporting to real-time continuous reporting. Although statutory financial reporting is currently done on a quarterly basis,

internal reporting with ERPs allows for close to the event reporting in many cycles (Vasarhelyi et al. 2010). Furthermore, Section 409 of Sarbanes Oxley Act requires real time reporting, which has been defined by the SEC as rapid reporting of significant events and accelerated issuance of financial reports.

There are a number of studies that examined continuous assurance and introduced several of its applications (Vasarhelyi and Halper 1991; Halper et al. 1992; Voarino and Vasarhelyi 2001). Elliot (2002) pinpointed the changes in the assurance service environment in the twenty first century, discussed how technology advances in financial reporting create the demand for online continuous assurance, and suggested future trends for assurance services. Alles et al. (2002) identified implementation problems of continuous assurance such as assurator's independence, payment infrastructures, and cost issues. The study stated that inherent demand for assurance is value adding in any transaction, and that the viability of continuous assurance is dependent upon the assurator's compensation, which reflects supply, demand, and design complexity. The concept of continuous assurance and its relevant future research issues were also examined.

Outcomes from continuous assurance processes include an expanded set of assurances, improved control processes, and enhanced data integrity (Vasarhelyi et al. 2004). A new continuous analytic monitoring-based assurance environment would allow increased understanding and monitoring in both integrated and non-integrated portions of the IT environment. The proposed levels of the architecture encompass transaction evaluation, measurement rule assurance, estimate assurance and consistency of

aggregate measures, and judgment assurance. However, the relationship between internal and external auditing, and concerns regarding independence are once again surfacing because the implementation of this system is based on each firm's ERP system.

### **3.2.3 Continuous Controls Monitoring**

The continuous auditing methodology enables the latency between –event occurrence and the related auditor assurance(s) to be reduced. Continuous auditing focuses on a narrower aspect of continuous assurance, and may be considered as a subset of continuous assurance (Alles et al. 2002, 2006). Continuous auditing has historically meant using software to detect auditor-specified exceptions from among all transactions that are processed in a real-time environment (Helmes and Mancino 1999). Fundamentals of continuous auditing are described in AICPA/CICA (1999). Effective continuous auditing development will enable auditors to continuously select, monitor, and analyze the client's internal control structure and accounting information systems (Rezaee et al. 2002). An approach for building automated auditing and a description for audit data marts and the data warehouse were presented by Rezaee et al. (2002). Robert and Harold (2003) pointed out that only a few auditors believe they are trained well enough to effectively use audit software. Given the numerous advantages of new audit tools, the study suggested that there is a need for auditors to improve their information technology proficiency in order to deploy continuous auditing methodologies efficiently and effectively.

While continuous auditing is the automated performance of control and risk assessments on an ongoing basis, continuous monitoring helps to ensure that policies,

procedures, and business processes operate effectively, and assists management in assessing the effectiveness of internal controls (De Aquino et al. 2008). The study by De Aquino et al. (2008) discusses the environment and context of continuous monitoring implementation. Under certain business processes and cycles, continuous monitoring often involves the automated testing of system activities against control rules. More recently, Vasarhelyi et al. (2010), proposed a third element in the continuous audit methodology entitled Continuous Risk Monitoring and Assessment (CRMA).

In 2006, a PricewaterhouseCoopers (PWC) survey indicated that half of responding firms have implemented some kind of continuous auditing or monitoring techniques, and most of the other firms have an implementation plan for the future. Alles et al. (2006) evaluated the Continuous Monitoring of Business Process Controls (CMBPC) approach implemented in the US internal IT audit department of Siemens Corporation. The study specifically examined the application of audit alarm management, alarm flood prevention, and approaches in dealing with audit issues using hierarchically structured alarms and assigning destinations via a rule-based approach.

Another PricewaterhouseCoopers study (2007) predicted that auditors will need to focus more on risk concerns and that the rating for continuous monitoring of relevant applications will be viewed as most important for internal audit over the ensuing five years. To implement continuous monitoring systems, five basic features are required: metrics, standards/models, analytics, alarms, and methods of measurement (Vasarhelyi and Halper 1991). For example, the study by Nigrini and Johnson (2008) described an audit risk score method to determine fraud or errors based on an adaptation of the IT-

monitoring framework of the International Federation of Accountants (IFAC) (2002). Their research examined the application of a continuous monitoring methodology in detecting fraud and errors of a franchise business using its monthly sales reports.

### **3.2.4 Implementation of Continuous Auditing and Continuous Controls**

#### **Monitoring**

In order to assist the audit process in adapting to changes in the financial reporting environment, several research studies developed and proposed frameworks (Flowerday et al. 2006; Kogan et al. 1999; Woodroof and Searcy 2001) that apply continuous assurance, continuous reporting, and continuous monitoring concepts.

Dull and Tegarden (2004) introduced “control charts” to monitor continuous financial information. Results suggested that combining future refinements of this technique along with statistical and analytical skills will enable the detection of financial processes that are not in control, which will enhance the reliability of information. The study by Dull et al. (2006) proposed the automated continuous transaction verification environment (ACTIVE), an innovative system that provides timely audit evidence. ACTIVE assists assurance providers by presenting a framework for timely confirmation of transactions and balances. It enables the transaction costs and traditional biases associated with the confirmation process to decrease, and solves confirmation response issues that arise in a traditional audit environment.

Santos et al. (2008) developed a conceptual model using real time analysis and modern control theory for continuous organizational auditing. This approach allows the implementation of continuous auditing mechanisms in real time, and whenever a



nonconformity or exception is found, the system updates or corrects the mechanisms. Gal (2008) examined issues relevant to continuous reporting systems including the information disclosed, level of detail, time lag, and methods available to query information. The study sheds light on the characteristics of continuous reporting and implications of this technology for investors, auditors, and managers.

Motivated by the occurrences of corporate fraud and scandals in the past decade, research on enterprise-risk management, internal controls, and continuous assurance issues has been expanded. For example, Vasarhelyi (2002) examined the Enron fraud case and suggested that the unreported related party partnerships could have been detected if continuous assurance processes were implemented. Kuhn and Sutton (2006) studied the WorldCom fraud case and focused analysis on proposing a SAP-based enterprise system with integrated continuous assurance strategy to detect fraudulent behavior. Koskivaara and Back (2007) presented an artificial neural network assistant (ANNA) application that analyzes monthly account values to assist with continuous auditing and monitoring of financial data. This application could automatically provide monthly reports on accounts that follow the predicted trend, and issue alerts about remaining accounts, which could subsequently be investigated.

Other studies also introduced or demonstrated the impact of new technologies in specific audit areas. Comunale and Sexton (2005) applied fuzzy expert systems to formalize and document the materiality assessment process by incorporating qualitative factors. Murthy (2004) examined the effects of including continuous monitoring controls in modern e-commerce systems. Capacity planning, capacity management and both internal and external auditors' requests for applying continuous monitoring

controls in e-commerce systems were supported. Hunton et al. (2007) examined the potential impact of more frequent financial reporting and concurrent assurance. Their findings suggest that more frequent reporting is likely to reduce a firm's ability to "manage" earnings; furthermore, although providing monthly reports is technically and economically feasible, concerns exist regarding the feasibility of daily reporting.

The next section provides a systematic analysis on continuous auditing literature by analyzing its content and classifying articles by their respective taxonomic attributes. The distribution and ranking of each taxonomic category illustrated in the next section will assist with our understanding of the developed characteristics of continuous auditing research, and suggest where future research may potentially lead us.

### **3.3 CHARACTERISTICS OF CONTINUOUS AUDITING RESEARCH**

#### **3.3.1 Methodology: Article Source and Collection**

Several searches<sup>1</sup> were conducted on continuous auditing related academic publications in multiple online academic research databases including *EbscoHost*, *Science Direct*, *Scopus*, *Wiley Library*, *ISI Web of Knowledge* and *Accounting Research Directory*<sup>2</sup>. Key terms including "continuous auditing," "continuous assurance," "continuous monitoring," and "continuous reporting" were queried in all databases. There was no limitation set on time frame of the search since the goal was to provide analysis on an extensive set of published continuous auditing academic literature. Search results from databases were cautiously reviewed to ensure no duplication of manuscripts occurred

---

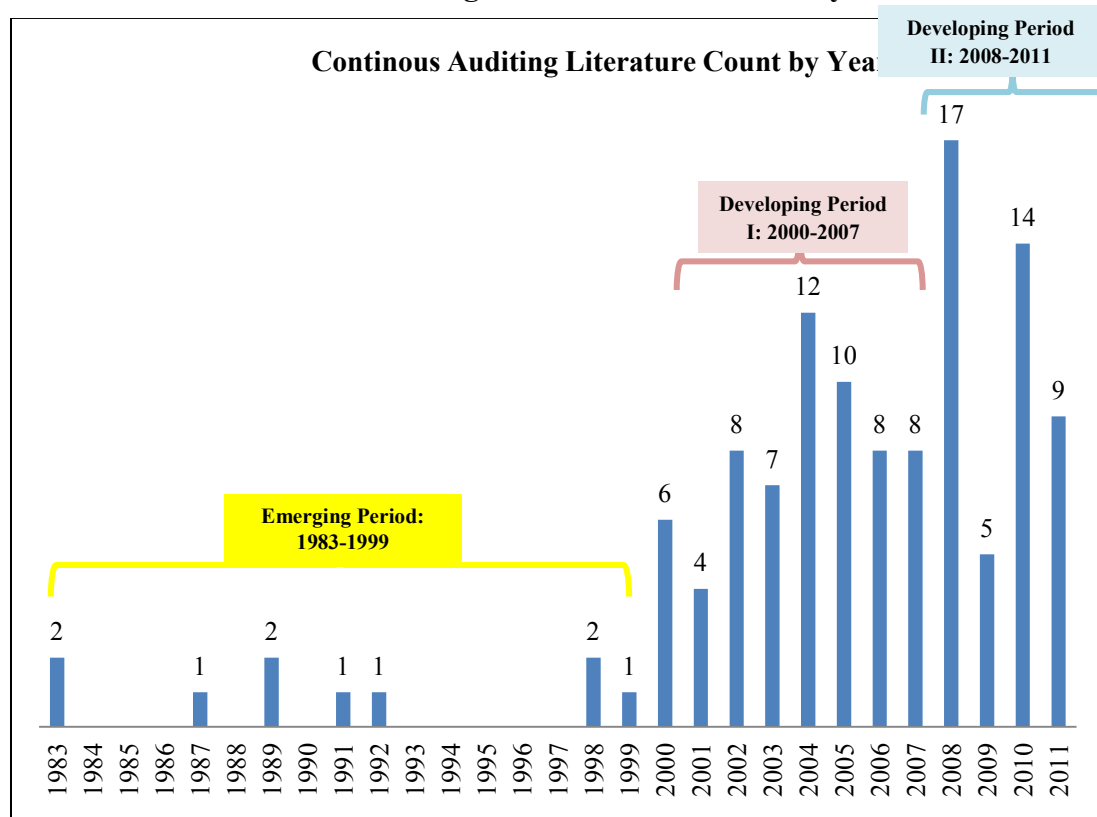
<sup>1</sup> The search incorporated articles published by late 2011. The search limited results to including full text, reference available and scholarly peer reviewed journal articles.

<sup>2</sup> Brown et al. (1994), this is a directory of academic publications of 12 journals in both accounting and accounting and information systems. The database is currently expanded by Rutgers University.

and that only main academic studies were incorporated<sup>3</sup>. After cross checking search results, a total of 118 articles relevant to continuous auditing were collected (Appendix III).

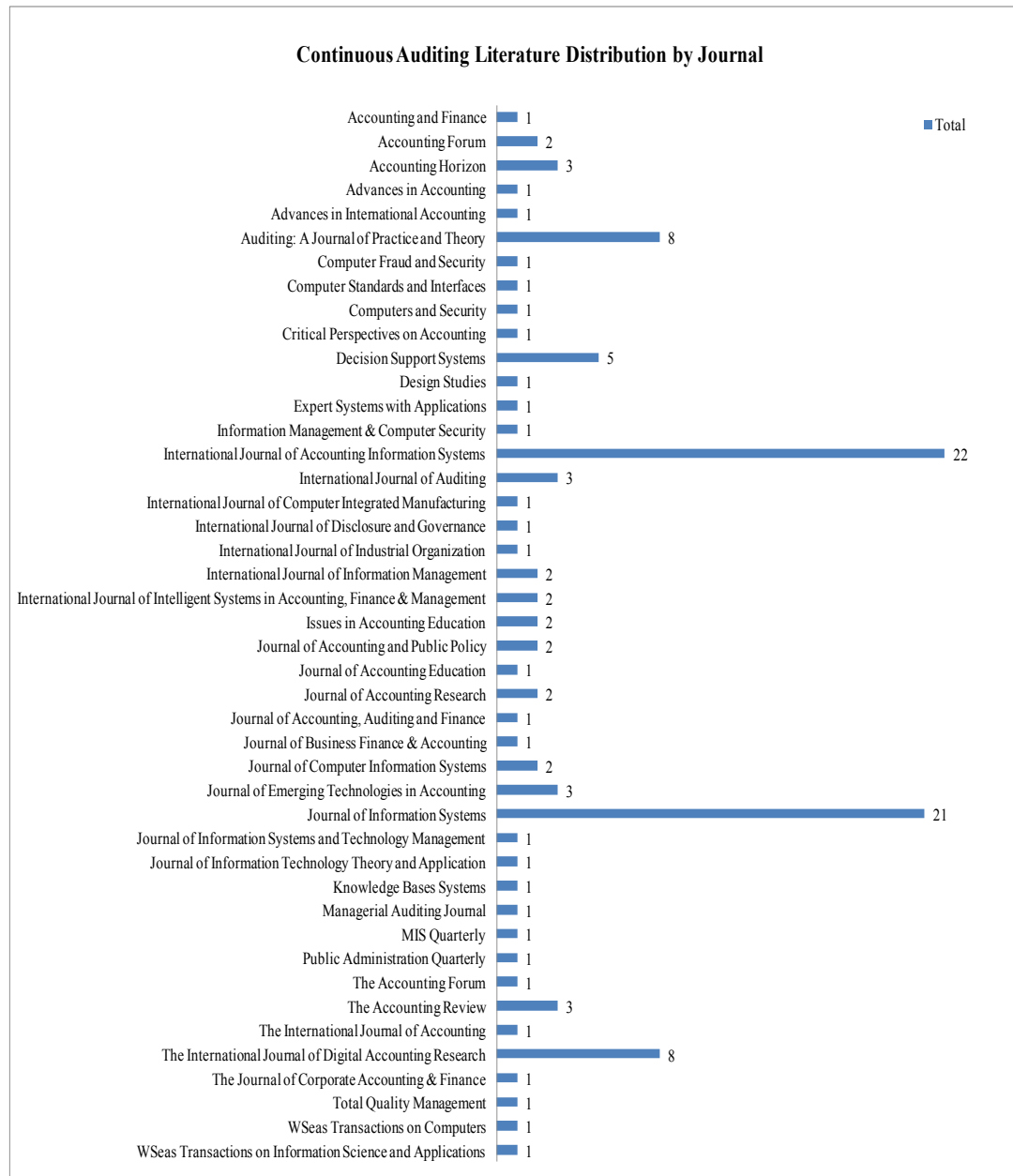
The 118 continuous auditing related studies collected were published from 1983 to 2011 (Figure 4). In this 28-year period, the peak publication year occurred in 2008 with 17 articles and is followed by 14 publications in 2010. In 2004 and 2005, there were 12 and 10 articles published, respectively. Furthermore, these ranked third and fourth in terms of publication frequency. Also, increases in publication volumes occurred in the years of 2000 and 2004, and these points are used to segregate analysis periods.

**FIGURE 4**  
**Continuous Auditing Literature Distribution by Year**



<sup>3</sup> In line with prior literature (e.g., Vasarhelyi et al. 1988), editorials, commentary and notes less than four pages are excluded from the analysis.

**FIGURE 5**  
**Continuous Auditing Literature Distribution by Journal**



The distribution of articles by journals is provided in (Figure 5). Continuous auditing research closely related to the accounting and accounting information systems field are published in a wide set of journals in accounting, accounting information systems, business, management, and information systems. Among the 44 journals, the five

journals that published the most continuous auditing research over the past three decades are *International Journal of Accounting Information Systems* (22), *Journal of Information Systems* (21), *Auditing: A Journal of Practice and Theory* (8), *International Journal of Digital Accounting Research* (8) and *Decision Support Systems* (5). Publications in these 5 journals accounts for 54 percent of the total 118 studies.

### **3.3.2 Taxonomic Categories Development**

Content analysis is a research method that can provide descriptive results of the nature of publications (Chiu and Vasarhelyi 2012). It has been employed to study the intellectual structure of publications in certain journals (Brown et al. 1987, 1989; Chiu and Vasarhelyi 2012; Just et al. 2011; Vasarhelyi et al. 1988). Brown et al. (2007) have qualitatively reviewed CA research by topic, while we employ a taxonomic approach attempting to analyze CA research from a quantitative perspective. Specifically, this study develops four taxonomic categories by which to classify each CA paper: research method, topical area, specific area of emphasis, and geographical area. Definitions for these categories follow.

*Research method* is a traditional taxonomic category of the literature taxonomy, indicating which research methodology was employed by the researcher. Three main research methods are identified in CA literature: analytical, archival, and empirical. Analytical studies apply either internal logic or simulations. Archival studies utilize sources either from primary or secondary records. Empirical studies can be carried out

as cases, surveys and interviews, and experiments. For the articles employing more than one research methodology, we build another criterion named “Mixed.”

*Topical area* category indicates the CA related topic the article contributes to. Seven items were created in this category according to the components of CA and its relating issues. Table 12 shows the explanation of each topic. Articles in the same topical area may have different emphases, while those in different topical areas may have the same purpose. In order to comprehensively demonstrate the research stream in CA literature, another category, called “Specific area of emphasis,” was designed to describe the purpose or objective of each article. Eleven areas, listed in Table 13, are developed for this category.

**TABLE 12**  
**Explanation of Topical Areas**

Topical area	Explanation
General Continuous Auditing	Involves high level CA research like grounding theory and framework of CA
Continuous Assurance	Includes studies about Continuous Data Assurance (CDA), (Continuous) System Assurance, Continuous Online Assurance and external Continuous Assurance research
Continuous Control Monitoring (CCM)	Consists research related to (continuously) monitoring of internal controls
Continuous Reporting (CR)	Denotes studies of frequent reporting and disclosure
Continuous Risk Monitoring and Assessment (CRMA)	Indicates dynamic risk measurement research
Enabling Technology	Refers to the essential technologies supporting CA and CR, such as electronization and XBRL
Audit Automation	Indicates studies on automating traditional manually performed auditing procedures.

**TABLE 13**  
**Description of Specific Area of Emphasis**

Specific area of emphasis	Description
Demand and Environment	Demand of CA/CR and the environment for CA/CR development
Concept Introduction and Development	Introduction of the emerging of CA/CR and its related concepts
Cost and Benefit	Cost and benefit of CA/CR
Impacts	Impacts of CA/CR on accounting/organization related areas
Assurance Measurement and Quality	CA/CR's assurance quality and measurement indicators
Perceived Value	Adoption/perceived value of CA/CR
Implementation in Practice	Implementation of CA systems to real cases
Systems/Models Development	Development of CA/CR systems/models
Technology/Method Introduction and Application	Introduction of new technologies originated from other areas to CA/CR and their application in CA/CR
Auditing Education	Educational issues about CA area such as CA course design
Research Opportunities/Evaluation	Survey, research agenda and future research directions in CA area

The last taxonomic category created captures the geographical area of authors. Analyzing this category facilitates discovery of the distribution of CA research around the world. The subfields in this category include US, Canada, Europe, Asia, Australia, Africa, and Mix.

### 3.3.3 Findings: Characteristics of Continuous Auditing Literature

#### 3.3.3.1 Research Method

Table 14 presents the distribution of articles according to research method. The primary research method employed in CA articles is Analytical (50%). Empirical-Survey (15.25%) is the second common research method used by CA papers, followed by Empirical-Case (13.56%) and Empirical-Experiment (11.02%). These three research methods are empirical methodologies and collectively account for 39.83% of all CA articles. The low percentage of archival studies (8.47%) may be due to the lack of suitable large data databases such as CRSP and COMPUSTAT.

**TABLE 14**  
**Distribution of Articles by Research Method**

Research Method	Count	Percentage
Analytical	59	50.00%
Empirical-Survey	18	15.25%
Empirical-Case	16	13.56%
Empirical-Experiment	13	11.02%
Archival	10	8.47%
Mixed	2	1.69%
Total	118	100.00%

#### 3.3.3.2 Topical Area

The distribution of CA articles by topical area is shown in Table 15. It reveals that General CA (33.90%) is the topical area that has been the most studied. One possible explanation for this finding is that CA is a relatively new research area; a large portion of CA research thought remains at a general level. The topics of CCM, enabling



technology, CR, continuous assurance, and audit automation are covered in similar proportions ranging from 16.95 to 9.32 percent. Also note that continuous risk monitoring and assessment is the topic that has been paid the least attention. Specifically, only two articles (1.69%) out of 118 address this issue, which indicates that this topical area is relatively new within the field.

**TABLE 15**  
**Distribution of Articles by Topical Area**

Topical Area	Count	Percentage
General CA	40	33.90%
Continuous Control Monitoring	20	16.95%
Enabling technology	18	15.25%
Continuous Reporting	14	11.86%
Continuous Assurance	13	11.02%
Audit Automation	11	9.32%
Continuous risk monitoring and assessment	2	1.69%
Total	118	100.00%

### ***3.3.3.3 Specific Area of Emphasis***

Table 16 depicts the distribution of articles according to specific area of emphasis. The results show that there are four areas targeted by more than 10percent of CA studies: development of CA systems or models (18.64%), CA demand and environment discussion (16.95%), introduction and application of CA supporting technology or methods (13.56%), and introduction of the development of CA and its related concepts (10.17%). Two of these three areas are technical in nature (“systems/models development” and “technology/methods introduction and application”), which suggests that the importance of technology in CA has been recognized. The high proportions of

the other two less technical areas (“demand and environment” and “concept introduction and development”) imply that CA is an emerging research area, which is consistent with our finding in topical area analysis.

“Implementation in practice” and “assurance measurement and quality” are the two topics that attracted less than 5 percent research effort in the CA area. More attention should be devoted to these two fields.

**TABLE 16**  
**Distribution of Articles by Specific Area of Emphasis**

Specific Area of Emphasis	Count	Percentage
Systems/models development	22	18.64%
Demand and environment	20	16.95%
Technology/Methods introduction and application	16	13.56%
Concept introduction and development	12	10.17%
Impact	11	9.32%
Research Opportunities/Evaluation	10	8.47%
Perceived value	9	7.63%
Auditing Education	6	5.08%
Cost and benefit	6	5.08%
Implementation in Practice	4	3.39%
Assurance measurement and quality	2	1.69%
Total	118	100.00%

#### ***3.3.3.4 Geographical Area***

The geographical distribution of CA research, shown in Table 17, demonstrates that, in general, CA is a worldwide research area. CA researchers come from all five

continents. However, more than half of the CA studies have been conducted in the U.S. (67.8%). Asia, Europe and Mix regions are in second place with each possessing the same percentage (8.47%). Consequently, CA has attracted a certain degree of research effort in Asia and Europe. Moreover, cross-region cooperation of CA research also implies the popularity of CA.

**TABLE 17**  
**Distribution of Articles by Geographical Area**

Geographical Area	Count	Percentage
US	80	67.80%
Asia	10	8.47%
Europe	10	8.47%
Mix	10	8.47%
Australia	3	2.54%
Canada	3	2.54%
Africa	2	1.69%
Total	118	100.00%

### **3.4 INTELLECTUAL STRUCTURE OF CONTINUOUS AUDITING RESEARCH**

#### **3.4.1 Methodology: References Collection, Citation and Co-Citation Analysis**

Citation and co-citation analysis methods utilize article references to reveal influential manuscripts and the intellectual structure of the continuous auditing research community. Citation analysis has been used to investigate how knowledge transfers over time in a certain discipline (Osareh 1996). The assumption underlying this method is that frequently cited articles have greater influence in a field than less cited ones. Co-

citation analysis is a method extended from citation analysis, enabling researchers to use co-cited reference pairs to infer and examine the communication network of a specified field/area. This method presents a historical view of the intellectual structure (McCain 1986; McCain 1990).

The cited references in all 118 continuous auditing articles were examined yielding a total of 3,496 references<sup>4</sup>. A subsequent examination on reference title, journal name, author names, and publication year was thoroughly completed prior to reference count to ensure correctness<sup>5</sup>. Reference count is essentially the frequency of a reference cited in the entire 118 set of studies. Highly-cited and influential references<sup>6</sup> are used for co-citation analysis. A co-cited pair exists when two references are cited together in a manuscript. For instance, if both reference A and reference B appear in manuscript A1, B1 and C1, reference A and B are identified as a co-cite pair with a co-cite frequency of three. The higher the co-cite frequency, the stronger the pair relationship is between references. The occurrence of each co-cited reference pair is counted in all 3,496 references; to focus analysis on core knowledge clusters formed in the research network, it is necessary to set a co-cite threshold (Garfield 1974; McCain 1986; McCain 1990). This threshold allows a researcher to parse the full co-citation network into core clusters that represent stronger co-citation relations<sup>7</sup>. A cluster is formed when at least three references are interlinked (Gmur 2003). The research clusters are

---

<sup>4</sup> For the purpose of examining academic research network, governmental reports & documents, accounting and auditing standards, professional articles are excluded from citation and co-citation analyses (Just et al., 2010).

<sup>5</sup> This step was necessary as references appeared erroneously in a number of research articles, e.g., misspelled article title or author names, and/or incorrect publication year. A thorough manual check was conducted to ensure the occurrence of unique reference is counted correctly.

<sup>6</sup> References cited 3 times and above were defined as highly-cited (influential) references.

<sup>7</sup> There has not been a consensus on the absolute threshold to select in parsing intellectual structure in the literature yet. This study followed the general guidance illustrated in prior studies and considered the sample size of articles and references to set the thresholds in each period (see Appendix IV). Continuous auditing research structure and clusters are visualized in ORA, a social network assessment application designed by Kathleen Carley, Carnegie Mellon University.

examined and interpreted both longitudinally and periodically in three narrower time frames (1983-1999, 2000-2007 and 2008-2011) as follows.

### **3.4.2 Findings: The Intellectual Structure of Continuous Auditing Research**

To examine the development of continuous auditing research, this study divided the 28-year period into three sub-periods using the years 2000 and 2008 as the dividing points as we observed obvious increases in article distributions in those years relative to others.

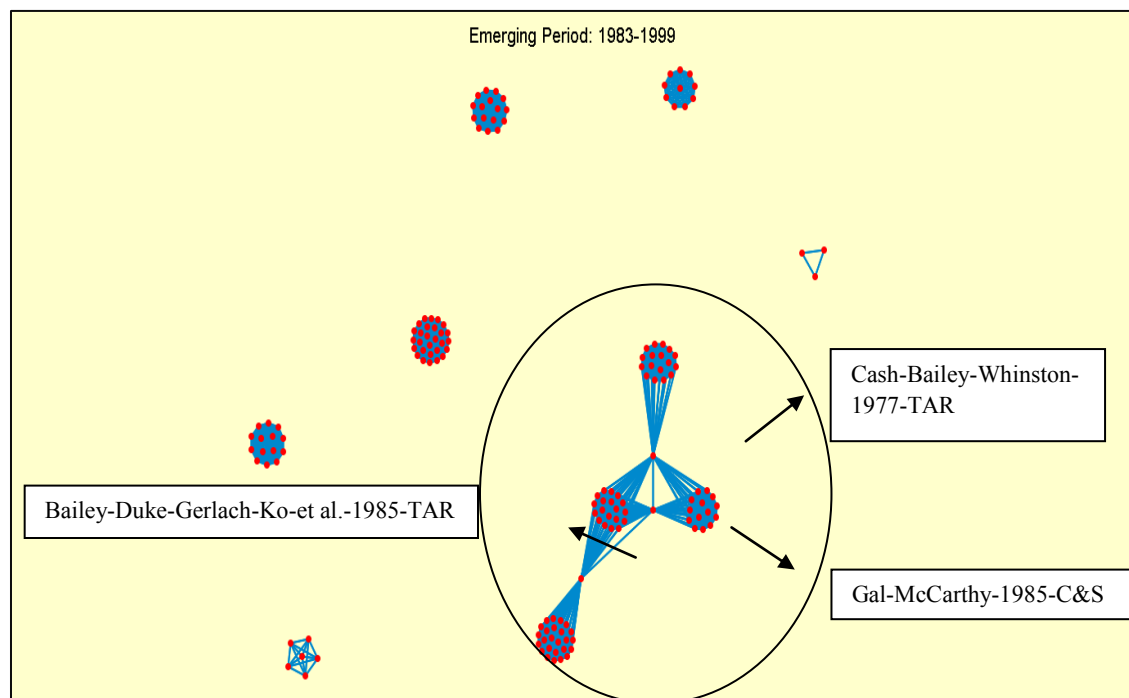
#### ***3.4.2.1 Emerging Period: 1983-1999***

There are ten continuous auditing relevant studies published between 1983 and 1999 in our collection. Figure 6 shows the intellectual structure of the ten manuscripts. We view this structure as the ground of continuous auditing research growth in the latter decade. Interpretation of this figure should be taken with care as the citation and co-citation analyses were completed by using the entire set of references and co-citation pairs instead of the highly-cited ones used in other time periods. This avoids leaving out low-cited references since, in this emerging period, there were few co-citation pairs identified. Furthermore, these low-cited references typically have the most influence in the field during the early stage.

Of the 155 cited references, only three stood out from the remaining since they were cited multiple times in the ten early published continuous auditing research studies (Table 18 & 19, Figure 6 & 7). *Cash et al. (1977)* was cited three times, followed by *Gal and McCarthy (1985)* and *Bailey et al. (1985)* having been cited twice. *Cash et al.*

(1977) reviewed relevant literature on auditing and EDP systems, and discussed specific advantages and disadvantages of a number of techniques used in EDP-based accounting information systems and their application to auditing as well. *Gal and McCarthy (1985)* contributed to internal controls specifications in a database environment and to the addressed data segmentation and access rights patterns issues of database security controls. *Bailey et al. (1985)* focused on assisting auditors' internal control evaluation by developing a TICOM model that enables internal control system modeling and querying using artificial intelligence concepts such as knowledge representation and graph simplification.

**FIGURE 6**  
**Emerging Period: Co-Citation Network**



**TABLE 18**  
**Emerging Period's Citation Frequency (>1)**  
**Emerging Period: 1983-1999**

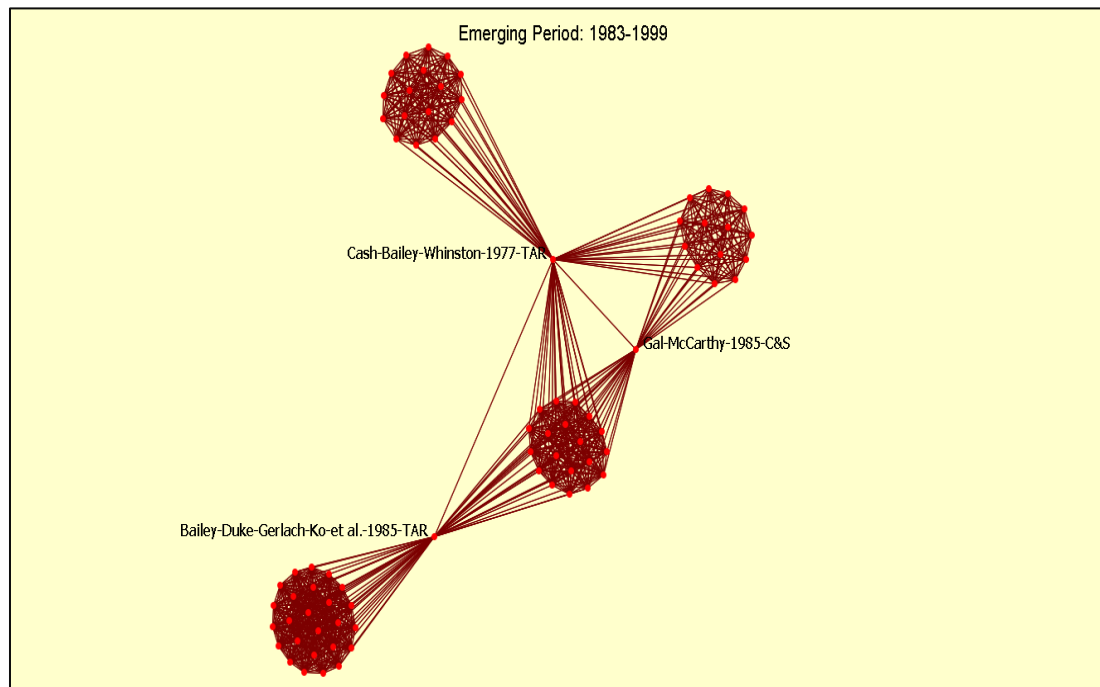
Emerging Period							
Most Cited References	Title	First Author	Year	Source	Citation Frequency	Frequent Co-Cited Refs	Citing Article
Cash-Bailey-Whinston-1977-TAR	A Survey of Techniques for Auditing EDP-Based Accounting Information Systems	Cash	1977	TAR	3	Twice with Gal & McCarthy [1985]	CA15, 17 & 45
Gal-McCarthy-1985-C&S	Specification of Internal Controls in a Database Environment	Gal	1985	C&S	2	Twice with Cash et al. [1977]	CA15 & 17
Bailey-Duke-Gerlach-Ko-et al.-1985-TAR	Ticom and the analysis of internal controls	Bailey	1985	TAR	2		CA17 & 44

**TABLE 19**  
**Citing Articles of Frequent Co-Cited References**

Data #	Continuous Auditing Paper List	Year	Journal
CA15	17-Groomer and Murthy-1989-Continuous Auditing of Database Applications An Embedded Audit Module Approach	1989	Journal of Information Systems
CA17	19-Kogan et al-1999-Continuous Online Auditing A Program of Research	1999	Journal of Information Systems

It is worth noting that *Cash et al. (1977)* and *Gal and McCarthy (1985)* were the only pair of references co-cited twice (in Groomer and Murthy 1989; Kogan et al. 1999), while all other pairs occurred once. In terms of knowledge combination, this implies that the degree of closeness between Groomer and Murthy (1989) and Kogan et al. (1999) is higher compared to other citing manuscripts in the emerging period. Despite the lack of three interlinked co-cited reference pairs forming research clusters, the three references regarded as more influential than others are *Cash et al. (1977)*, *Gal and McCarthy (1985)* and *Bailey et al. (1985)*. These studies serve as building blocks toward the formation of continuous auditing research at a very early stage.

**FIGURE 7**  
**Emerging Period: Co-Citation Group (Threshold>0)**



#### ***3.4.2.2 Developing Period I: 2000-2007***

This section examines the intellectual structure of continuous auditing in the years from 2000 to 2007. Figure 8 shows the full research network with 58 references; these references have been cited at least three times in the continuous auditing research published in this period. This study partitioned the network to examine the core clusters that have the most influence on this period's continuous auditing development by applying a 0.38 co-cite weight threshold (Garfield 1974; McCain 1986; McCain 1990). This allows us to identify three influential co-cited clusters whose topical areas consist of “Principles of Continuous Auditing, Monitoring & Assurance,” “Online & Internet Financial Reporting,” and “E-commerce & Systems Assurance” (Figure 9).

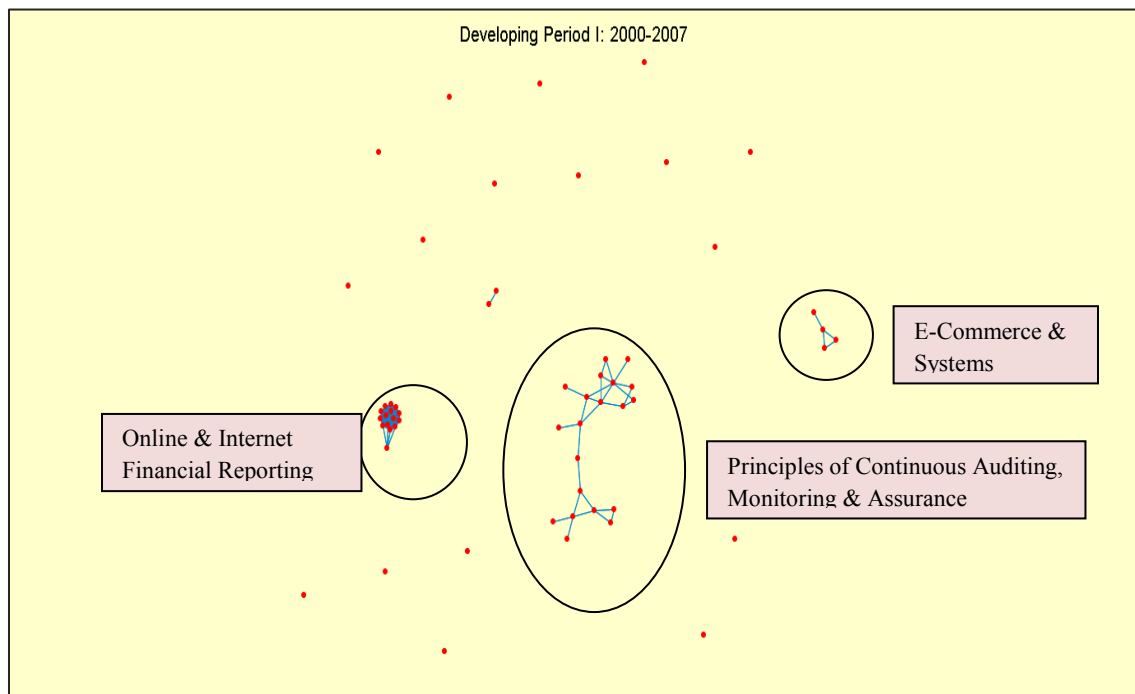


The “**Principles of Continuous Auditing, Monitoring & Assurance**” cluster consists of interlinked references which collectively forms and illustrates the concepts of continuous auditing and assurance, pros and cons of implementing continuous auditing applications, and issues of continuous monitoring analytics and transactions. Among the 20 references identified, *Groomer and Murthy (1989)* and *Vasarhelyi and Halper (1991)* are the earliest published core references that hold the most linkages in the network. *Groomer and Murthy (1989)* addressed an embedded audit module approach to assist auditors in collecting audit information continuously; *Vasarhelyi and Halper (1991)* developed a Continuous Process Auditing System (CPAS) for internal audit, and

this was the very first study demonstrating the importance of the real time systems audit by contrasting it with the traditional audit approach.

Compared to the two research clusters that are introduced subsequently, this largest cluster represents a stronger influence in the field than the other two in this developing period based on size and weight of co-citation links. A number of references apply a normative theoretical approach to address research propositions, and these studies were published in well regarded journals such as *Auditing: A Journal of Practice and Theory* (4), *Journal of Information Systems* (3), *International Journal of Accounting Information Systems* (3), and *Journal of Emerging Technology in Accounting* (1)..., etc (Table 20 & 22).

**FIGURE 9**  
**Developing Period I: Top 123 Co-Citation Pairs (Threshold  $\geq 0.38$ )**

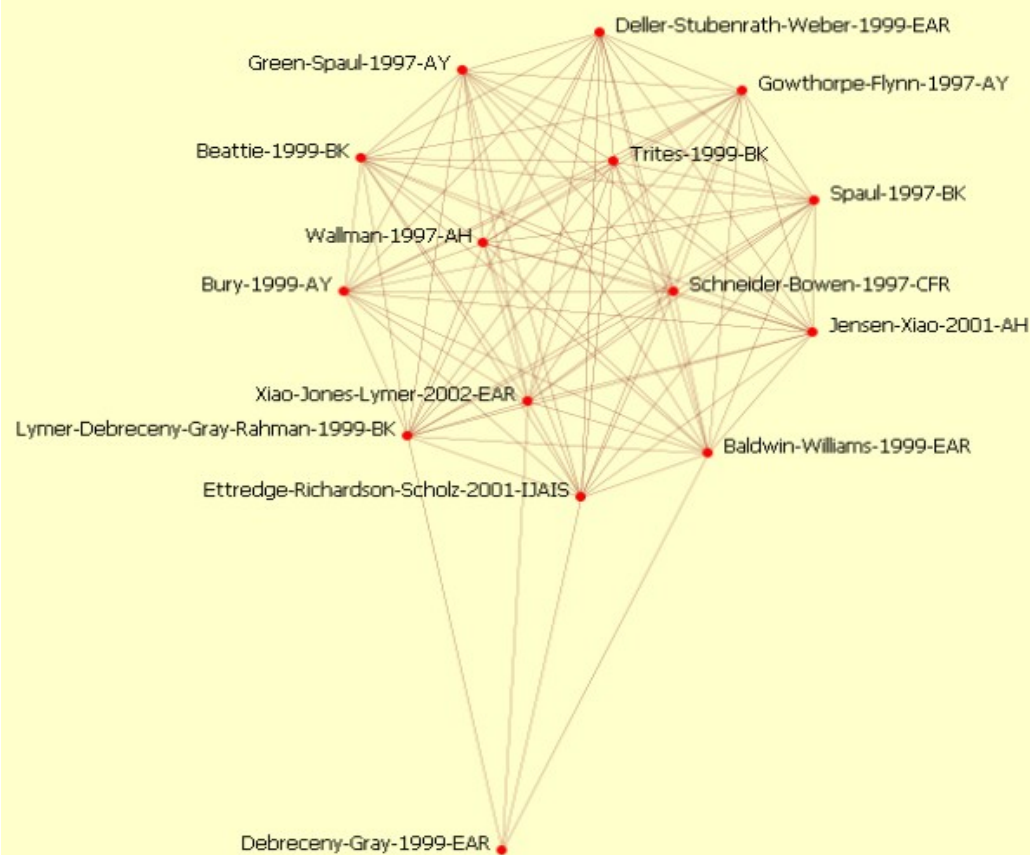


**TABLE 20**  
**Developing Period I: Cluster #2-1 and #2-2**

#2-1: Principles of Continuous Auditing, Monitoring & Assurance	
<p style="text-align: center;"><b>Developing Period I: 2000-2007</b></p>	
Key References	
<ul style="list-style-type: none"> <li>•Alles-Kogan-Vasarhelyi-2002-AUD</li> <li>•Alles-Kogan-Vasarhelyi-2003-ISCJ</li> <li>•Alles-Kogan-Vasarhelyi-2004-ICFAI</li> <li>•Alles-Kogan-Vasarhelyi-2004-IJAIS</li> <li>•Daigle-Lampe-2003-IAG</li> <li>•Elliott-2002-AUD</li> <li>•Groomer-Murthy-1989-JIS</li> <li>•Groomer-Murthy-2003-IJA</li> <li>•Kogan-Sudit-Vasarhelyi-1999-JIS</li> <li>•Murthy-2004-JIS</li> </ul>	<ul style="list-style-type: none"> <li>•Murthy-Groomer-2004-IJAIS</li> <li>•Nelson-2004-IA</li> <li>•Rezaee-Sharbatoghlie-Elam-McMickle-2002-AUD</li> <li>•Searcy-Woodroof-2003-CPAJ</li> <li>•Searcy-Woodroof-Behn-2003-CFR</li> <li>•Vasarhelyi-2002-BK</li> <li>•Vasarhelyi-Alles-Kogan-2004-JETA</li> <li>•Vasarhelyi-Greenstein-2003-IJAIS</li> <li>•Vasarhelyi-Halper-1991-AUD</li> <li>•Warren-Parker-2003-IIARF</li> </ul>

## #2-2: Online &amp; Internet Financial Reporting

## Developing Period I: 2000-2007



## Key References

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Baldwin-Williams-1999-EAR</li> <li>• Beattie-1999-BK</li> <li>• Bury-1999-AY</li> <li>• Debreceeny-Gray-1999-EAR</li> <li>• Deller-Stubenrath-Weber-1999-EAR</li> <li>• Ettredge-Richardson-Scholz-2001-IJ AIS</li> <li>• Gowthorpe-Flynn-1997-AY</li> <li>• Green-Spaul-1997-AY</li> </ul> | <ul style="list-style-type: none"> <li>• Jensen-Xiao-2001-AH</li> <li>• Lymer-Debreceeny-Gray-Rahman-1999-BK</li> <li>• Schneider-Bowen-1997-CFR</li> <li>• Spaul-1997-BK</li> <li>• Trites-1999-BK</li> <li>• Wallman-1997-AH</li> <li>• Xiao-Jones-Lymer-2002-EAR</li> </ul> |
|--|--|

**TABLE 21**  
**Developing Period I: Cluster #2-3**

#2-3: E-Commerce & Systems Assurance
<p><b>Developing Period I: 2000-2007</b></p> <pre> graph TD     A[Elliott-2001-CFR] --- B[Arnold-Lampe-Masselli-Sutton-2000-JIS]     B --- C[Lala-Arnold-Sutton-Guan-2002-IJAIS]     B --- D[Mauldin-Arunachalam-2002-JIS]     C --- D     A --- D </pre>
Key References
<ul style="list-style-type: none"> <li>• Arnold-Lampe-Masselli-Sutton-2000-JIS</li> <li>• Elliott-2001-CFR</li> <li>• Lala-Arnold-Sutton-Guan-2002-IJAIS</li> <li>• Mauldin-Arunachalam-2002-JIS</li> </ul>

**TABLE 22**  
**Developing Period I: Cluster References #2-1**

Developing Period I	Cluster Topic	Ref Code in Clusters	Title	First Author	Year	Source
Cluster #2-1	Principles of Continuous Auditing, Monitoring & Assurance	Alles-Kogan-Vasarhelyi-2002-AUD	FEASIBILITY AND ECONOMICS OF CONTINUOUS ASSURANCE	Alles	2002	AUD
		Alles-Kogan-Vasarhelyi-2003-ISCJ	BLACK BOX LOGGING AND TERTIARY MONITORING OF CONTINUOUS ASSURANCE SYSTEMS	Alles	2003	ISCJ
		Alles-Kogan-Vasarhelyi-2004-ICFAI	REAL TIME REPORTING AND ASSURANCE: HAVE THEIR TIME COME?	Alles	2004	ICFAI
		Alles-Kogan-Vasarhelyi-2004-IJAIS	RESTORING AUDITOR CREDIBILITY: TERTIARY MONITORING AND LOGGING OF CONTINUOUS ASSURANCE SYSTEMS	Alles	2004	IJAIS
		Daigle-Lampe-2003-IAG	RESPONDING TO THE SARBANES-OXLEY ACT WITH CONTINUOUS ONLINE ASSURANCE	Daigle	2003	IAG
		Elliott-2002-AUD	21ST CENTURY ASSURANCE	Elliott	2002	AUD
		Groomer-Murthy-1989-JIS	CONTINUOUS AUDITING OF DATABASE APPLICATIONS: AN EMBEDDED AUDIT MODULE APPROACH	Groomer	1989	JIS
		Groomer-Murthy-2003-IJA	MONITORING HIGH-VOLUME ONLINE TRANSACTION PROCESSING SYSTEMS USING A CONTINUOUS SAMPLING APPROACH	Groomer	2003	IJA
		Kogan-Sudit-Vasarhelyi-1999-JIS	CONTINUOUS ONLINE AUDITING: A PROGRAM OR RESEARCH	Kogan	1999	JIS
		Murthy-2004-JIS	AN ANALYSIS OF THE EFFECTS OF CONTINUOUS MONITORING CONTROLS ON E-COMMERCE SYSTEM PERFORMANCE	Murthy	2004	JIS
		Murthy-Groomer-2004-IJAIS	A CONTINUOUS AUDITING WEB SERVICES MODEL FOR XML-BASED ACCOUNTING SYSTEMS	Murthy	2004	IJAIS
		Nelson-2004-IA	STEPPING INTO CONTINUOUS AUDIT	Nelson	2004	IA
		Rezaee-Sharbatoghlie-Elam-McMickle-2002-AUD	CONTINUOUS AUDITING: BUILDING AUTOMATED AUDIT CAPABILITY	Rezaee	2002	AUD
		Searcy-Woodrooff-2003-CPAJ	CONTINUOUS AUDITING: LEVERAGING TECHNOLOGY	Searcy	2003	CPAJ
		Searcy-Woodrooff-Behn-2003-CFR	CONTINUOUS AUDIT: THE MOTIVATIONS, BENEFITS, PROBLEMS, AND CHALLENGES IDENTIFIED BY PARTNERS OF A BIG 4 ACCOUNTING FIRM	Searcy	2003	CFR
		Vasarhelyi-2002-BK	CONCEPTS IN CONTINUOUS ASSURANCE	Vasarhelyi	2002	BK
		Vasarhelyi-Alles-Kogan-2004-JETA	PRINCIPLE OF ANALYTIC MONITORING FOR CONTINUOUS ASSURANCE	Vasarhelyi	2004	JETA
		Vasarhelyi-Greenstein-2003-IJAIS	UNDERLYING PRINCIPLES OF THE ELECTRONIZATION OF BUSINESS: A RESEARCH AGENDA	Vasarhelyi	2003	IJAIS
		Vasarhelyi-Halper-1991-AUD	THE CONTINUOUS AUDIT OF ONLINE SYSTEMS	Vasarhelyi	1991	AUD
		Warren-Parker-2003-IIARF	CONTINUOUS AUDITING: POTENTIAL FOR INTERNAL AUDITORS	Warren	2003	IIARF

The cluster on “**Online & Internet Financial Reporting**” consists of 15 densely interlinked references<sup>8</sup> that are published in late 1990s and early 2000 (Table 21 & 23). This subgroup of research contributes to understanding the impact of technology on financial reporting. Specifically, these papers analyze issues about the migration of traditional corporate business reporting towards an online format as well as trends of the ubiquitous reporting environment. The core references of this cluster include *Baldwin and Williams (1999)*, *Ettredge et al. (2001)*, *Lymer et al. (1999)*, and *Xiao et al. (2002)*. References from this subgroup were cited from *European Accounting Review* (4), monographs (4), *Accountancy* (3), *Accounting Horizons* (2), *International Journal of Accounting Information Systems* (1), conference proceedings (1).

The “**E-commerce & Systems Assurance**” cluster includes four references on the assurance subject with a specification on systems assurance and e-commerce assurance (Table 21 & 23). References in this cluster include articles from the early 2000s. Research issues such as the e-commerce assurance impact on online purchase, market demand for assurance on software products, and web assurances for e-commerce are explored. The reference that centered the cluster, *Arnold et al. (2000)*, examined the impact of a two-tier reporting model on the market demand for reliability of software product assurance services. Implications for the design of new assurance service models in the accounting profession are addressed. References in this subgroup were cited from *Journal of Information Systems* (2), *International Journal of Accounting Information Systems* (1) and *Conference Proceedings* (1).

---

<sup>8</sup> In the figures, the distance between nodes in the clusters represents the significance of the co-cited weight. The closer the two nodes are, the stronger the co-citation weight is, vice versa.

**TABLE 23**  
**Developing Period I: Cluster References #2-2 and #2-3**

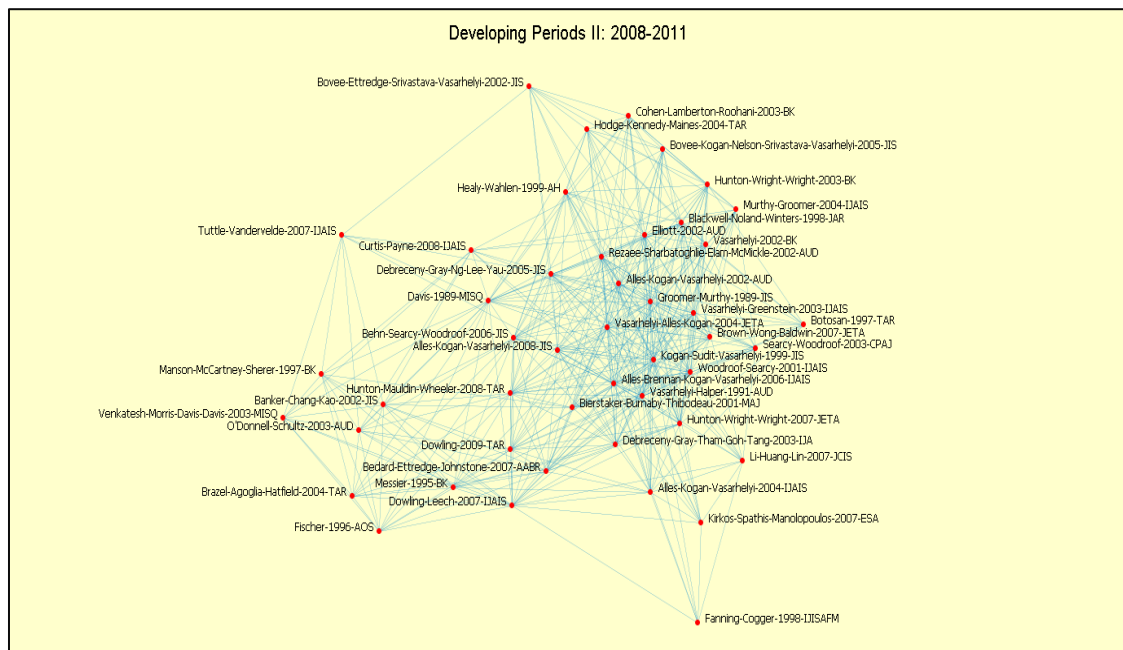
Developing Period I	Cluster Topic	Ref Code in Clusters	Title	First Author	Year	Source
Cluster #2-2	Online & Internet Financial Reporting	Baldwin-Williams-1999-EAR	THE FUTURE OF INTELLIGENT AGENTS IN EUROPEAN FINANCIAL REPORTING	Baldwin	1999	EAR
		Beattie-1999-BK	BUSINESS REPORTING: AN INEVITABLE CHANGE?	Beattie	1999	BK
		Bury-1999-AY	ON LINE AND ON TIME	Bury	1999	AY
		Debreceny-Gray-1999-EAR	FINANCIAL REPORTING ON THE INTERNET AND THE EXTERNAL AUDIT	Debreceny	1999	EAR
		Deller-Stubenrath-Weber-1999-EAR	A SURVEY ON THE USE OF THE INTERNET FOR INVESTOR RELATIONS IN THE USA, THE UK AND GERMANY	Deller	1999	EAR
		Ettredge-Richardson-Scholz-2001-IJ AIS	THE PRESENTATION OF FINANCIAL INFORMATION AT CORPORATE WEB SITES	Ettredge	2001	IJ AIS
		Gowthorpe-Flynn-1997-AY	REPORTING ON THE WEB: THE STATE OF THE ART	Gowthorpe	1997	AY
		Green-Spaul-1997-AY	DIGITAL ACCOUNTABILITY	Green	1997	AY
		Jensen-Xiao-2001-AH	CUSTOMIZED FINANCIAL REPORTING, NETWORKED DATABASES AND DISTRIBUTED FILE SHARING	Jensen	2001	AH
		Lymer-Debreceny-Gray-Rahman-1999-BK	BUSINESS REPORTING ON THE INTERNET	Lymer	1999	BK
		Schneider-Bowen-1997-CFR	USER-CUSTOMIZED FINANCIAL REPORTING: THE POTENTIAL OF DATABASE ACCOUNTING AND THE INTERNET	Schneider	1997	CFR
		Spaul-1997-BK	CORPORATE DIALOGUE IN THE DIGITAL AGE	Spaul	1997	BK
		Trites-1999-BK	THE IMPACT OF TECHNOLOGY ON FINANCIAL AND BUSINESS REPORTING	Trites	1999	BK
		Wallman-1997-AH	THE FUTURE OF ACCOUNTING AND FINANCIAL REPORTING, PART FIVE: 'ACCESS' ACCOUNTING	Wallman	1997	AH
		Xiao-Jones-Lymer-2002-EAR	IMMEDIATE TRENDS IN INTERNET REPORTING	Xiao	2002	EAR
Cluster #2-3	E-Commerce & Systems Assurance	Arnold-Lampe-Masselli-Sutton-2000-JIS	AN ANALYSIS OF THE MARKET FOR SYSTEMS RELIABILITY ASSURANCE SERVICES	Arnold	2000	JIS
		Elliott-2001-CFR	21ST CENTURY ASSURANCE	Elliott	2001	CFR
		Lala-Arnold-Sutton-Guan-2002-IJ AIS	THE IMPACT OF RELATIVE INFORMATION QUALITY OF E-COMMERCE ASSURANCE SEALS ON INTERNET PURCHASING BEHAVIOR	Lala	2002	IJ AIS
		Mauldin-Arunachalam-2002-JIS	AN EXPERIMENTAL EXAMINATION OF ALTERNATIVE FORMS OF WEB ASSURANCE FOR BUSINESS-TO CONSUMER E-COMMERCE	Mauldin	2002	JIS



### 3.4.2.3 Developing Period II: 2008-2011

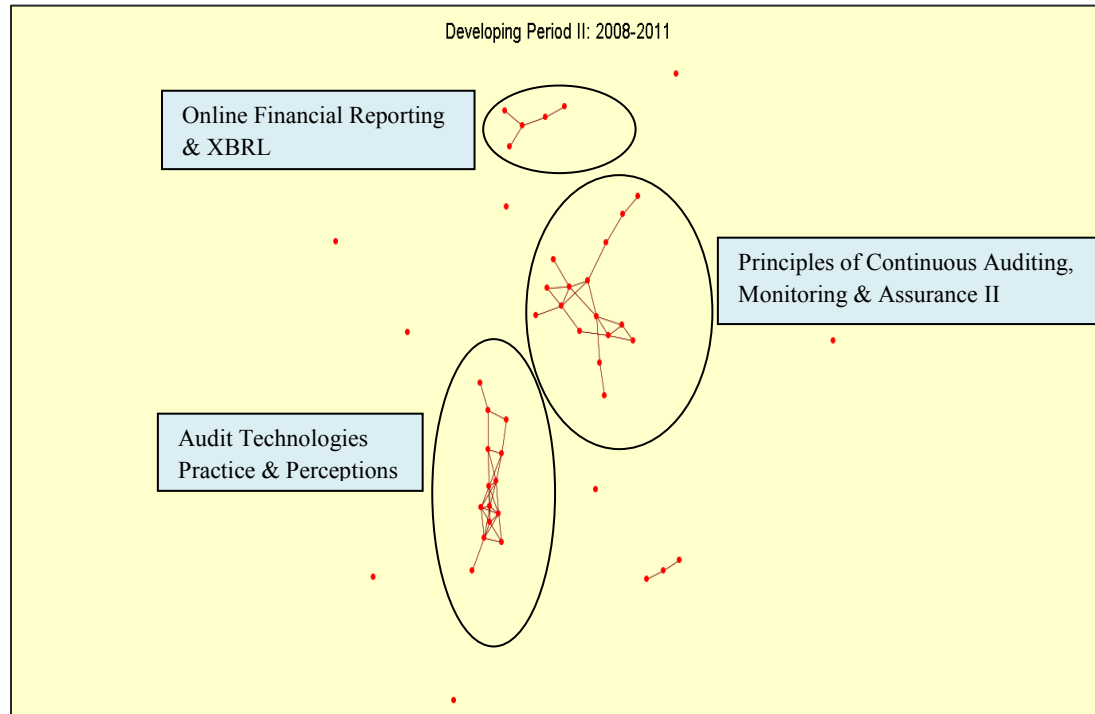
This section addresses the intellectual structure of continuous auditing between 2008 and 2011. Figure 10 shows the full research network that includes references with at least three citations. The network is partitioned into core research clusters to reveal the top 58 co-citation reference pairs<sup>9</sup>. This enabled the identification of three influential co-cited clusters, “Principles of Continuous Auditing, Monitoring & Assurance II,” “Audit Technologies Practice & Perceptions,” and “Online Financial Reporting & XBRL” (Figure 11).

**FIGURE 10**  
**Developing Period II: Full Co-Citation Network**  
**Developing Period II: 2008-2011**



<sup>9</sup> The density of this network (0.417) is found higher than prior two periods (emerging period: 0.123; developing period I: 0.372) which implies using the same level of partition threshold in prior period would only provide a very limited number of references in the structure. After exploring different levels of granularity, the 0.31 threshold would allow us to reveal the top 58 reference pairs formed in three clusters in this period.

**FIGURE 11**  
**Developing Period II: Top 58 Co-Citation Pairs ( $\geq$  Threshold 0.31)**



The research cluster of “**Principles of Continuous Auditing, Monitoring & Assurance II**” consists of research mainly on the conceptual framework, demand, cost and benefits of continuous auditing, monitoring & assurance and business electronization (Table 24 & 26). Of the 16 references in this cluster, 10 overlap with the “Principles of Continuous Auditing, Monitoring, and Assurance” cluster identified in the prior developing period (*Groomer and Murthy 1989; Vasarhelyi and Halper 1991; Kogan et al. 1999; Alles et al. 2002; Rezaee et al. 2002; Vasarhelyi 2002; Searcy and Woodroof 2003; Vasarhelyi and Greenstein 2003; Alles et al. 2004; Vasarhelyi et al. 2004*) which suggests that the field has been continuously growing and expanding new research thought by building on these influential references. The core references identified in this cluster are *Groomer and Murthy (1989), Vasarhelyi and Halper*

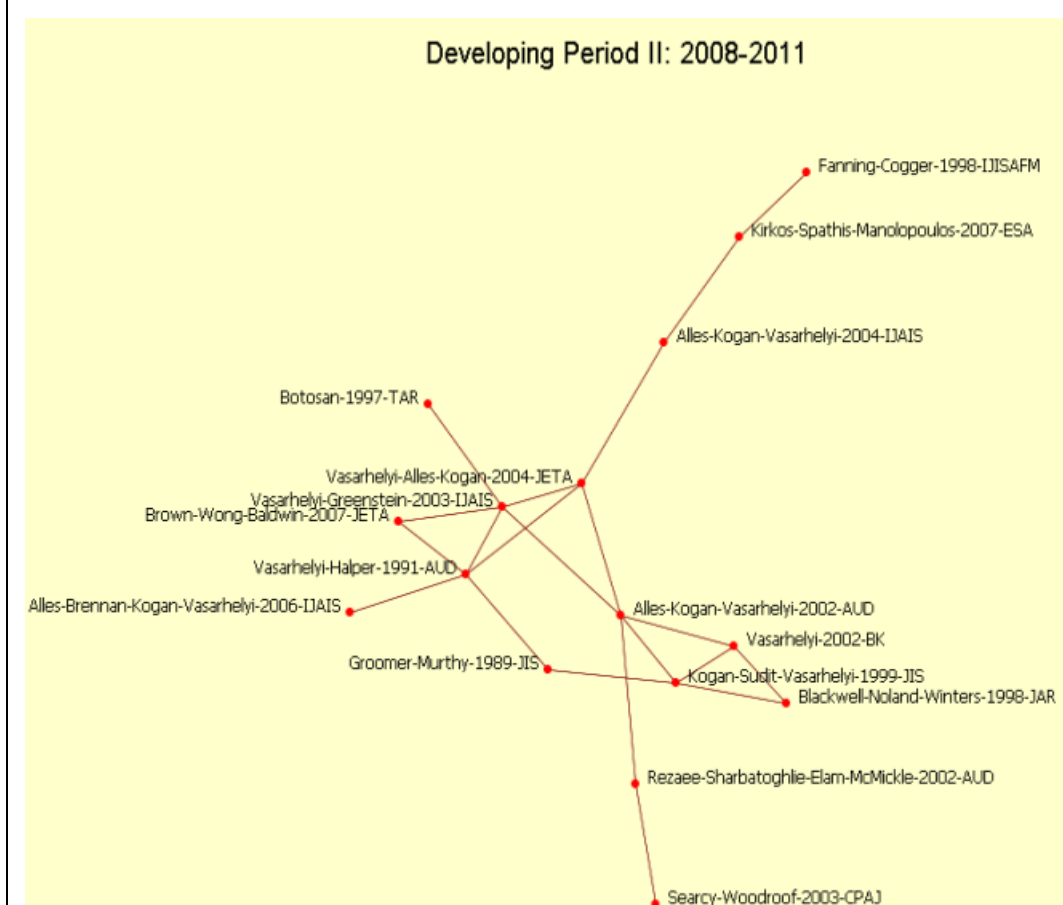
(1991), Kogan et al. (1999), Alles et al. (2002) and Vasarhelyi and Greenstein (2003).

These references propose and address fundamentals, elements, and the need for continuous auditing, mainly by a normative conceptualization approach.

Other than grounding the same references from the early period, studies that are newly grouped in this cluster explore multiple fraud detection techniques (e.g., data mining & neural networks) as a branch of continuous controls monitoring (*Fanning and Cogger 1998; Kirkos et al. 2007*), as a case study of preliminary continuous auditing in practice (*Alles et al. 2006*), as a case study of disclosure cost and assurance value (*Botosan 1997; Blackwell et al. 1998*) as well as a review of continuous auditing literature prior to 2006 (*Brown et al. 2007*).

**TABLE 24**  
**Developing Period II: Cluster #3-1 and #3-2**

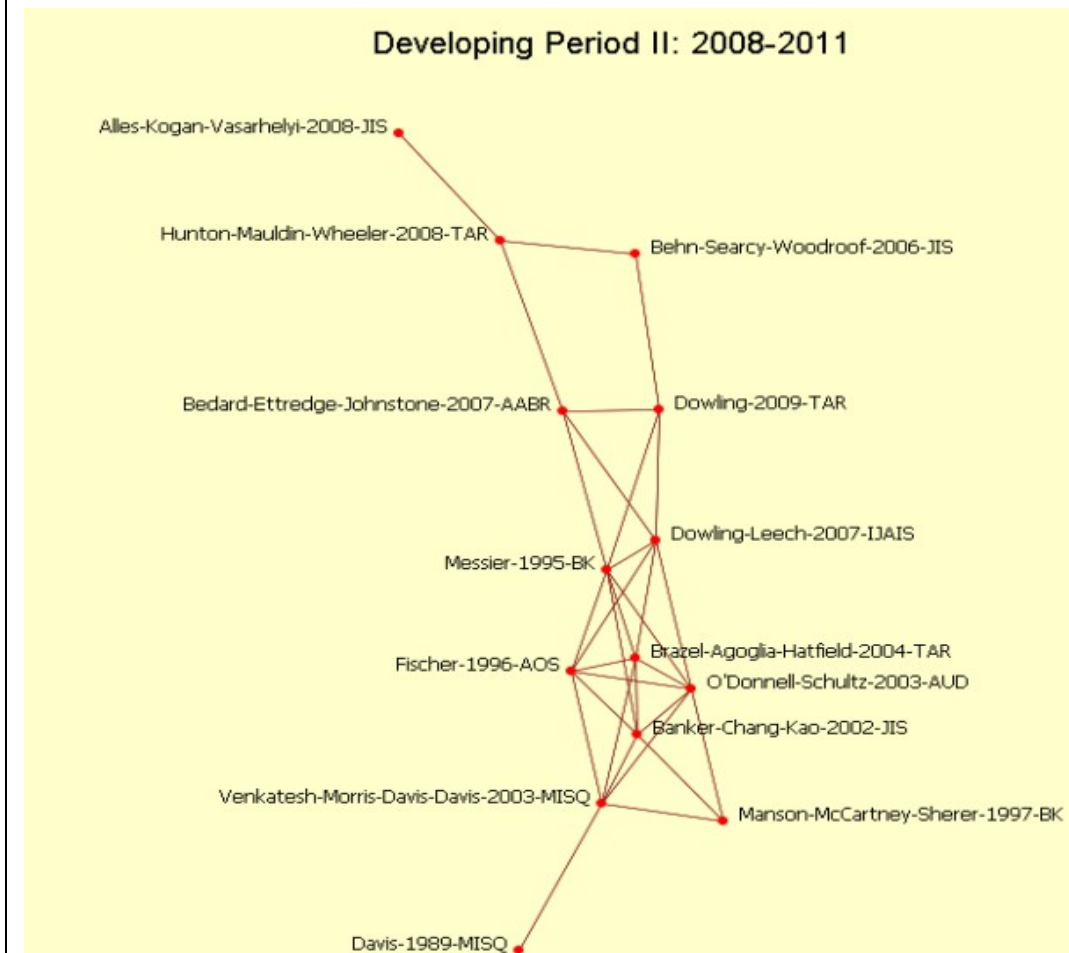
#3-1: Principles of Continuous Auditing, Monitoring and Assurance II



**Key References**

- Alles-Brennan-Kogan-Vasarhelyi-2006-IJAIS
- Alles-Kogan-Vasarhelyi-2002-AUD
- Alles-Kogan-Vasarhelyi-2004-IJAIS
- Blackwell-Noland-Winters-1998-JAR
- Botosan-1997-TAR
- Brown-Wong-Baldwin-2007-JETA
- Fanning-Cogger-1998-IJISAFM
- Groomer-Murthy-1989-JIS
- Kirkos-Spathis-Manolopoulos-2007-ESA
- Kogan-Sudit-Vasarhelyi-1999-JIS
- Rezaee-Sharbatoghlie-Elam-McMickle-2002-AUD
- Searcy-Woodroof-2003-CPAJ
- Vasarhelyi-2002-BK
- Vasarhelyi-Alles-Kogan-2004-JETA
- Vasarhelyi-Greenstein-2003-IJAIS
- Vasarhelyi-Halper-1991-AUD

### #3-2: Audit Technologies Practice & Perceptions



#### Key References

- |                                       |                                    |
|---------------------------------------|------------------------------------|
| • Alles-Kogan-Vasarhelyi-2008-JIS     | • Dowling-Leech-2007-IJAIS         |
| • Banker-Chang-Kao-2002-JIS           | • Fischer-1996-AOS                 |
| • Bedard-Ettredge-Johnstone-2007-AABR | • Hunton-Mauldin-Wheeler-2008-TAR  |
| • Behn-Searcy-Woodroof-2006-JIS       | • Manson-McCartney-Sherer-1997-BK  |
| • Brazel-Agoglia-Hatfield-2004-TAR    | • Messier-1995-BK                  |
| • Davis-1989-MISQ                     | • O'Donnell-Schultz-2003-AUD       |
| • Dowling-2009-TAR                    | • Venkatesh-Morris-Davis-2003-MISQ |

**TABLE 25**  
**Developing Period II: Cluster #3-3**

#3-3: Online Financial Reporting & XBRL
<p><b>Developing Period II: 2008-2011</b></p> <pre> graph TD     A[Murthy-Groomer-2004-IJAIS] --- B(( ))     B --- C[Hodge-Kennedy-Maines-2004-TAR]     B --- D[Cohen-Lamberton-Roohani-2003-BK]     B --- E[Bovee-Ettredge-Srivastava-Vasarhelyi-2002-JIS]     B --- F[Bovee-Kogan-Nelson-Srivastava-Vasarhelyi-2005-JIS]     style B fill:none,stroke:none   </pre>
Key References
<ul style="list-style-type: none"> <li>• Bovee-Ettredge-Srivastava-Vasarhelyi-2002-JIS</li> <li>• Bovee-Kogan-Nelson-Srivastava-Vasarhelyi-2005-JIS</li> <li>• Cohen-Lamberton-Roohani-2003-BK</li> <li>• Hodge-Kennedy-Maines-2004-TAR</li> <li>• Murthy-Groomer-2004-IJAIS</li> </ul>

**TABLE 26**  
**Developing Period II: Cluster References #3-1**

Developing Period II	Cluster Topic	Ref Code in Clusters	Title	First Author	Year	Source
Cluster #3-1	Principles of Continuous Auditing, Monitoring and Assurance II	Alles-Brennan-Kogan-Vasarhelyi-2006-IJAIS	CONTINUOUS MONITORING OF BUSINESS PROCESS CONTROLS: A PILOT IMPLEMENTATION OF A CONTINUOUS AUDITING SYSTEM AT SIEMENS	Alles	2006	IJAIS
		Alles-Kogan-Vasarhelyi-2002-AUD	FEASIBILITY AND ECONOMICS OF CONTINUOUS ASSURANCE	Alles	2002	AUD
		Alles-Kogan-Vasarhelyi-2004-IJAIS	RESTORING AUDITOR CREDIBILITY: TERTIARY MONITORING AND LOGGING OF CONTINUOUS ASSURANCE SYSTEMS	Alles	2004	IJAIS
		Blackwell-Noland-Winters-1998-JAR	THE VALUE OF AUDITOR ASSURANCE: EVIDENCE FROM LOAN PRICING	Blackwell	1998	JAR
		Botosan-1997-TAR	DISCLOSURE LEVEL AND THE COST OF CAPITAL	Botosan	1997	JETA
		Brown-Wong-Baldwin-2007-JETA	A REVIEW AND ANALYSIS OF THE EXISTING RESEARCH STREAMS IN CONTINUOUS AUDITING	Brown	2007	TAR
		Fanning-Cogger-1998-IJISAFM	NEURAL NETWORK DETECTION OF MANAGEMENT FRAUD USING PUBLISHED FINANCIAL DATA	Fanning	1998	IJISAFM
		Groomer-Murthy-1989-JIS	CONTINUOUS AUDITING OF DATABASE APPLICATIONS: AN EMBEDDED AUDIT MODULE APPROACH	Groomer	1989	JIS
		Kirkos-Spathis-Manolopoulos-2007-ESA	DATA MINING TECHNIQUES FOR THE DETECTION OF FRAUDULENT FINANCIAL STATEMENTS	Kirkos	2007	ESA
		Kogan-Sudit-Vasarhelyi-1999-JIS	CONTINUOUS ONLINE AUDITING: A PROGRAM OF RESEARCH	Kogan	1999	JIS
		Rezaee-Sharbatoghlie-Elam-McMickle-2002-AUD	CONTINUOUS AUDITING: BUILDING AN AUTOMATED AUDITING CAPABILITY	Rezaee	2002	AUD
		Searcy-Woodroof-2003-CPAJ	CONTINUOUS AUDITING: LEVERAGING TECHNOLOGY	Searcy	2003	CPAJ
		Vasarhelyi-2002-BK	CONCEPTS IN CONTINUOUS ASSURANCE	Vasarhelyi	2002	BK
		Vasarhelyi-Alles-Kogan-2004-JETA	PRINCIPLES OF ANALYTIC MONITORING FOR CONTINUOUS ASSURANCE	Vasarhelyi	2004	JETA

The “**Audit Technologies Practice & Perceptions**” cluster consists of 14 references with subjects such as audit aids application, audit process automation, and the usefulness of technologies viewed by the accounting profession (Table 25 & 27). The influence of information technologies on auditor productivity and audit team performance during audit preparation (e.g., audit planning, analytical procedures, audit controlling) are the main issues examined by references centering this research cluster

(Messier 1995; Fischer 1996; Banker et al. 2002; Brazel et al. 2004; Dowling 2009). A number of these core studies addressed firm factors, perceptions, and benefits of technology usage via survey and field study methods. In addition, studies on continuous auditing implementations in firms as well as the functionality and impact of continuous controls monitoring formed the knowledge in this cluster (Alles et al. 2008; Hunton et al. 2008). Source outlets for this cluster are a mixture of accounting, accounting and information, and management information systems journals and monographs.

The “**Online Financial Reporting & XBRL**” group focuses on business reporting topics such as the application of eXtensible Business Reporting Language (XBRL) taxonomy and Financial Reporting and Auditing Agent with Net Knowledge (FRAANK) on accessing and integrating information for corporate online reporting, and how information technology frameworks (e.g., XML and Web Services) can assist audit firms in providing assurance for business processes. Bovee et al. (2005) and Cohen et al. (2003) are the core references of this group in which common grounds are shared with the “Online & Internet Financial Reporting” cluster in the prior period. Research scope and directions in this period, however, had extended to explore the usage, impact and future of XBRL and Web technologies on corporate financial reporting (Table 25 & 27).



**TABLE 27**  
**Developing Period II: Cluster References #3-2 and #3-3**

Developing Period II	Cluster Topic	Ref Code in Clusters	Title	First Author	Year	Source
Cluster #3-2	Audit Technologies Practice & Perceptions	Alles-Kogan-Vasarhelyi-2008-JIS	PUTTING CONTINUOUS AUDITING THEORY INTO PRACTICE: LESSONS FROM TWO PILOT IMPLEMENTATIONS	Alles	2008	JIS
		Banker-Chang-Kao-2002-JIS	IMPACT OF INFORMATION TECHNOLOGY ON PUBLIC ACCOUNTING FIRM PRODUCTIVITY	Banker	2002	JIS
		Bedard-Ettredge-Johnstone-2007-AABR	USING ELECTRONIC AUDIT WORKPAPER SYSTEMS IN AUDIT PRACTICE: TASK ANALYSIS, LEARNING, AND RESISTANCE	Bedard	2007	AABR
		Behn-Searcy-Woodroof-2006-JIS	A WITHIN FIRM ANALYSIS OF CURRENT AND EXPECTED FUTURE AUDIT LAG DETERMINANTS	Behn	2006	JIS
		Brazel-Agoglia-Hatfield-2004-TAR	ELECTRONIC VERSUS FACE-TO-FACE REVIEW: THE EFFECTS OF ALTERNATIVE FORMS OF REVIEW ON AUDIT PREPARER PERFORMANCE AND ACCOUNTABILITY PERCEPTIONS	Brazel	2004	TAR
		Davis-1989-MISQ	PERCEIVED USEFULNESS, PERCEIVED EASE OF USE AND USER ACCEPTANCE OF INFORMATION TECHNOLOGY	Davis	1989	MISQ
		Dowling-2009-TAR	APPROPRIATE AUDIT SUPPORT SYSTEM USE: THE INFLUENCE OF AUDITOR, AUDIT TEAM AND FIRM FACTORS	Dowling	2009	TAR
		Dowling-Leech-2007-IJ AIS	AUDIT SUPPORT SYSTEM DESIGN AND DECISION AIDS: CURRENT PRACTICE AND OPPORTUNITIES FOR FUTURE RESEARCH	Dowling	2007	IJ AIS
		Fischer-1996-AOS	REALIZING THE BENEFITS OF NEW TECHNOLOGIES AS A SOURCE OF AUDIT EVIDENCE: AN INTERPRETIVE FIELD STUDY	Fischer	1996	AOS
		Hunton-Mauldin-Wheeler-2008-TAR	POTENTIAL FUNCTIONAL AND DYSFUNCTIONAL EFFECTS OF CONTINUOUS MONITORING	Hunton	2008	TAR
		Manson-McCartney-Sherer-1997-BK	AUDIT AUTOMATION: THE USE OF INFORMATION TECHNOLOGY IN THE PLANNING, CONTROLLING AND RECORDING OF AUDIT WORK	Manson	1997	BK
		Messier-1995-BK	RESEARCH IN AND DEVELOPMENT OF AUDIT-DECISION AIDS	Messier	1995	BK
		O'Donnell-Schultz-2003-AUD	THE INFLUENCE OF BUSINESS-PROCESS-FOCUSED AUDIT SUPPORT SOFTWARE ON ANALYTICAL PROCEDURES JUDGMENTS	O'Donnell	2003	AUD
		Venkatesh-Morris-Davis-Davis-2003-MISQ	USER ACCEPTANCE OF INFORMATION TECHNOLOGY: TOWARD A UNIFIED VIEW	Venkatesh	2003	MISQ
Cluster #3-3	Online Financial Reporting & XBRL	Bovee-Ettredge-Srivastava-Vasarhelyi-2002-JIS	DOES THE YEAR 2000 XBRL TAXONOMY ACCOMMODATE CURRENT BUSINESS FINANCIAL-REPORTING PRACTICE?	Bovee	2002	JIS
		Bovee-Kogan-Nelson-Srivastava-Vasarhelyi-2005-JIS	FINANCIAL REPORTING AND AUDITING AGENT WITH NET KNOWLEDGE (FRAANK) AND EXTENSIBLE BUSINESS REPORTING LANGUAGE (XBRL)	Bovee	2005	JIS
		Cohen-Lamberton-Roohani-2003-BK	THE IMPLICATIONS OF ECONOMIC THEORIES FOR DATA LEVEL ASSURANCES: RESEARCH OPPORTUNITIES	Cohen	2003	BK
		Hodge-Kennedy-Maines-2004-TAR	DOES SEARCH FACILITATING TECHNOLOGY IMPROVE THE TRANSPARENCY OF FINANCIAL REPORTING?	Hodge	2004	TAR
		Murthy-Groomer-2004-IJ AIS	A CONTINUOUS AUDITING WEB SERVICES MODEL FOR XML-BASED ACCOUNTING SYSTEMS	Murthy	2004	IJ AIS

### 3.5 CONCLUSION AND IMPLICATIONS

Advances in technology are significant forces affecting the accounting profession (AICPA 1998). The opportunities and potential to apply information technology in the audit field have been continuously growing with technology advancement. Continuous auditing fundamentals, theories, and implementations have been now established and

explored in practice for over two decades. Acknowledging the importance of this research stream, this study reviews extant prior literature concerning continuous auditing, and reveals the development of its research characteristics and intellectual structure. This study aims to provide a review of influential manuscripts in continuous auditing.

In review, continuous auditing research is longitudinally mainly normative analytical. Empirical survey and case studies categories were the second and third most frequently used methods. The specific areas of emphasis include the development of systems/models that assist with the continuous audit, demand and environment that triggers CA growth, and enabling technologies for CA applications. The work is mainly sourced in the United States.

Examining periodic citation and co-citation analysis, there was very limited research conducted in the 1983-1999 time period that is relative to continuous auditing. This period is deemed as the emerging stage of continuous auditing research. In the subsequent developing periods, this study was able to identify three main research clusters for each. In 2000-2007, knowledge combination on “Principles of Continuous Auditing, Monitoring & Assurance,” “Online & Internet Financial Reporting,” and “E-commerce & Systems Assurance” were shown. In 2008-2011, research clusters on “Principles of Continuous Auditing, Monitoring & Assurance II,” “Audit Technologies Practice & Perceptions,” and “Online Financial Reporting & XBRL” were revealed. It is observed that the two clusters of the “Principles of Continuous Auditing, Monitoring & Assurance” topic in two developing periods share ten identical references (*Groomer and Murthy 1989; Vasarhelyi and Halper 1991; Kogan et al. 1999; Alles et al. 2002;*

*Rezaee et al. 2002; Vasarhelyi 2002; Searcy and Woodroof 2003; Vasarhelyi and Greenstein 2003; Alles et al. 2004; Vasarhelyi et al. 2004*). This suggests that these studies have been recognized by scholars as key reference manuscripts, and have been impacting new research thought formation as well as grounding the continuous auditing field for more than a decade.

With the application of multiple bibliometrics methods, the main characteristics of continuous auditing research and its citation communication networks since the early 80s have been identified. It is worth noting that the key cited references in each of the three periods not only suggest research accomplishments but also provide educational implications in supporting accounting information systems courses in higher education programs. New scholars would find it helpful to refer to the continuous audit taxonomy and citations structure for grasping the understanding of continuous audit development upon entering accounting academics. In addition, through analyzing citations communication network, the recent period shows more knowledge communication interactions between continuous audit academic research and audit practice oriented research which is a promising and valuable sign of growth. If research ideas are generated with reference to feedback, opinion and perceptions from practitioners, this in turn would generate more interests at the practitioners end to become audience of academic research and further facilitate collaborations. The concern with regards to the gap between academic research and professional practice in accounting could at least be minimized in the continuous auditing field.

Although this study attempted to search and collect the entire set of literature relevant to continuous auditing by utilizing numerous online databases, there may still be a

potential limitation of having an incomplete dataset. However, as both the number of articles and analysis extends beyond prior secondary review studies, the findings in this essay would still be enable to reveal the grand structure and characteristics of the field.

Along with the growth of applications and concepts of information technology, the need for obtaining timely financial information and assuring control data integrity have gained importance over time. These requirements can be met by applying new accounting information systems techniques within businesses. Knowledge communication within the continuous auditing field as represented by research co-citation clusters will continue to grow and mature with emerging technologies in the future.

## **CHAPTER 4**

### **THE ADVANCEMENT OF BEHAVIORAL ACCOUNTING RESEARCH - A TAXONOMIC ANALYSIS ON RESEARCH CHARACTERISTICS**

#### **4.1 OVERVIEW**

Accounting numbers are described as both a cause and an effect of human behavior. The responsibilities of accountants have been increasingly observed as extending beyond simple measurement and aggregation to including the perception and use of accountants' information by others (Hofstedt and Kinard 1970). Accountants can deliberately design their systems to influence behavior. Accounting is a phenomenon in which its form, functioning and consequences are interdependent with the contexts that it operates in (Hopwood 1989).

Burgstahler and Sundem (1989) pointed out that researching in accounting supports the understanding of individual human information processing behavior and the aggregated consequences resulted from individual decisions. An examination of the literature will reveal something about where we are and how we might proceed to a more desirable point (Hofstedt 1976). Surveying the development of behavioral accounting research has been a critical task conducted periodically and it is apparent that an overview of the status quo of behavioral accounting has been lacking in the recent decade. Building upon the literature, this essay attempts to fill the gap by examining the historical development of behavioral accounting and the characteristics of it using a comprehensive taxonomy constructed specifically for behavioral accounting research.

The characteristics of behavioral accounting research published in a number of accounting journals are analyzed across six decades.

This essay contributes to the accounting literature by reviewing the emergence and progression of behavioral accounting research historically, developing a unique taxonomy for behavioral accounting research characteristics to identify over time development of research characteristics including research methods, accounting area, topical behavioral focus and subtopical behavioral components. There are a number of research questions this essay attempts to address.

- Research Question 1: How did behavioral accounting research field emerge in the accounting discipline?
- Research Question 2: What are the main research attributes identified in the behavioral accounting field longitudinally?
- Research Question 3: What are the main research characteristics that can be identified in the early two decades (1950-1970), middle two decades (1971-1991) and the recent two decades (1992-2013)?
- Research Question 4: How has changes occurred over time and what areas are considered newly developed in behavioral accounting?

Overall, the findings in this essay are compared across different accounting subfields and time period. The historical development of behavioral accounting research characteristics is conducted by a taxonomic classification and comparative analysis approaches. Implications on future research trend are addressed as well.

This chapter is organized as follows. The next section provides a historical background of the emergence and development of behavioral research in accounting along the past decades and ties in the discussion from major accounting journal, accounting education and accounting practice perspectives. The third section introduces the taxonomy development process and other statistical research methodology applied in the chapter. The fourth section discusses findings from research classifications and compares the statistical distribution of it across different dimensions and time frame. And last but not least, the final section concludes with a summary of results and future implications.

## **4.2 A REVIEW OF BEHAVIORAL ACCOUNTING RESEARCH FIELD**

### **4.2.1 The Emergence and Scope of Behavioral Thought in Accounting**

Behavioral accounting research has emerged and broadened in the accounting literature since the 1960s, a period so called the “Decade of Awakening” (Dyckman and Zeff 1984; Lord 1989). Lord (1989) described that 1960s was a time when the academics began to expand research dimensions by investigating implications of accounting statements and information on decision makers and examining normative issues such as the preparation of accounting reports. The first academic publication recognized as behavioral accounting research was published in *The Accounting Review* (TAR), the article considered consumers' psychological attitudes of accounting information (Devine 1960). The first official usage of the “behavioral accounting” term, however, was introduced to the literature a few years later in a discussion piece for Cook (1967) titled “*The Effect of Frequency of Feedback on Attitudes and Performance*” by Becker (1967).

Behavioral accounting research (hereafter, BAR) is distinguished from other schools of thought as an area in the accounting scholarship that applies methodologies and theories from the behavioral sciences to examine the interface between accounting information & processes and the behavior of human and/or organization (Becker 1967). Hofstedt and Kinard (1970) defined behavioral accounting research as “the study of behavioral of accountants” or “the behavioral of non-accountants as they are influenced by accounting functions and reports.” As a relatively young school of thought in comparison with others in accounting literature, BAR still shares commonalities with other schools, e.g., BAR originated from accounting phenomenon observation and the observation is systematic, as stated by Birnberg and Shields (1989). Policy makers group, investors, auditors, managers and academics are often considered the audience of BAR. What really differentiates BAR from other schools is its concern with “behavioral sciences.” The methods applied in studies are often laboratory and/or field. Unlike efficient market research, BAR observes individual and/or group behavior and draws theories from behavioral sciences, e.g., experimental economics can be an example of BAR when it involves systematic observation of particular aspects of human behavior rather than market forces (Birnberg and Shields 1989).

Behavioral accounting research is a multidisciplinary field that falls on the intersection of different research dimensions, e.g., financial, managerial and tax accounting research, and draws from the theoretical constructs of the behavioral sciences (Lord 1989). Economics, political science, organization theory, psychology, and sociology disciplines have all contributed to research in behavioral accounting along the years.



#### **4.2.2 Early Development of Behavioral Research: 1960s - 1980s**

In the early 1960s, the effects of accounting information on consumers were addressed by many scholars. There was also increased concern from the professional community over the type of communication that accounting is providing to the consumers of accounting information (Lord 1989). Interests in examining behavioral influences of accounting information on individuals and organizations grew and led to more publications on which toward the end of 1960s.

Foreseeing the criticality of behavioral accounting research, Hofstede and Kinard (1970) advocated the need of an overall strategy to help develop and shape a specific research movement of BAR. The study suggested three perspectives of research progress to be made in behavioral accounting: 1) the influence of the accountant's technical functions on behavioral, 2) the behavior of accountants, and 3) the influence of accounting information on those receiving the information. Hofstede (1976) provided comparison of BAR and security price research from 1964-1973 to compare and address why BAR failed to generate internally and/or externally valid results to any significant extent in that age. Findings suggest that BAR was progressing but still considered pre-paradigmatic.

A critical area of development of BAR was found in the mid 70s to 80s on human information processing. Libby and Lewis (1982) drawn upon the framework provided by Libby and Lewis (1977) to evaluate the decision making accounting research conducted within 1977-1982 using the lens model, probabilistic judgment, pre-decisional behavioral, and cognitive style approaches. The study applied a

methodological perspective and discussed the impact of research on practice as well as future directions of research development. Since the 1970s, there were more than 100 experiments published in the major accounting journals, including AOS, TAR, and JAR as examined by Swieringa and Weick (1982); majority of the research focused on the behavior of subjects in response to a wide variety of stimuli and settings.

Three decades of BAR development on the schools, research subjects and ideas were investigated by Birnberg and Shields (1989); the article identified five main schools through clustering relevant BAR papers that consists of Managerial Control, Accounting Information Processing, Accounting Information System Design, Auditing Research, and Organizational Sociology.

Burgstahler and Sundem (1989) identified five areas of BAR progression are summarized upon surveying articles from 1968-1987, namely, testing of theories, using appropriate statistical methods, improving internal/external validity tradeoffs, improving the use of related disciplines and broadening the perspective of BAR. The overall two-decade assessment indicated that 1) behavioral research methods were used for accounting issues without adoption of any underlying behavioral theories, 2) behavioral models or theories were adopted since late 1960s to mid 1970s, and 3) research shown testing of behavioral models in an accounting context, e.g., the Brunswik's lens model.

Weaknesses of BAR exist in the lack of enough attention to develop new theories, the lack of theories precision needed for prediction and convergence to generally accepted paradigms, the need for definition and measurement for variables, the overreliance on

positivistic research methods developed in natural science, the difficulty to obtain appropriate subjects, and the recognition of the differential advantages of accountants. Though yet considered a broad and unfocused discipline back then, Burgstahler and Sundem (1989) predicted that BAR will have an important influence on the accounting and auditing products of the future. The study stated that it is important to realize that most accounting research has a common goal, that is, to learn how people process information. More coordinated research strategies within various research areas are in need.

#### **4.2.3 Development of Behavioral Research: 1990s to Date**

Managerial and auditing accounting fields have a longer behavioral accounting research history compared to other subfields in accounting. Therefore, the conducted behavioral accounting research and research questions raised in these two areas have gradually been growing in many smaller scopes and subfields along the years simultaneously which is a common observation seen in the process of development and growth in any discipline. This argument is supported by the findings in the second part of this essay as well.

There are a number of areas that have been addressed more extensively in prior literature in this period of time, namely, judgment and decision making research, psychological/environmental behavioral consequences, secondary reviews/critique and research opportunities identification in the behavioral accounting field. For example, Luckett and Eggleton (1991) examined the complex behavioral consequences of feedback settings towards organizational members and its relationship with

psychological perspective changes, such as the perceived closeness, self-esteem, and interpersonal relationships between superiors and subordinates. The study by Tymon et al. (1998) presented a model and framework of antecedents and consequences for perceived environmental uncertainty literature in order to clarify its nature and role in the behavioral accounting research by reviewing articles and providing recommendations regarding future usage of perceived environmental uncertainty in accounting research. The comprehensive model includes strategic, design, individual, and effectiveness levels of analysis.

Solomon and Trotman (2003) examined the research in experimental judgment and decision making area of research published in the first 25 years of *Accounting, Organization, and Society* (AOS) using citations analysis approach with focuses on behavioral accounting characteristics and its impact between the 1976 to 2000 period. Trotman (2011) pointed out that judgment and decision making research has reached a consolidation stage in the 1990s. Many studies extended and built upon the progress in decision making and judgment since the 1980s by providing behavioral framework describing factors of performance, by analyzing audit task components, understanding knowledge structures and expertise effects on audit decisions, and by revealing the detail behavioral aspects of audit analytical procedure (e.g., Bonner 1990; Knooe 1992; Libby and Luft 1993; Ashton and Ashton 1995; Libby 1995; Messier 1995; Solomon and Shields 1995).

Secondary review articles in behavioral accounting research have been conducted in various accounting subfields. For example, experimental economics approach and its relationship with behavioral accounting experiments have been examined by Moser

(1998). Research providing a historical analysis of behavioral research's role and importance in management accounting education field is reviewed by Birnberg (2000). Prior literature also examines environmental behavioral accounting (e.g., Tymon et al. 1998), financial accounting experimental settings (e.g., Libby et al. 2002), and analytical procedure approaches in the auditing field (e.g., Messier et al. 2013).

There are a number of articles that offer overview of BAR from a broader and grand behavioral accounting research development perspective (e.g., Bamber 1993; Birnberg 2011) instead of only focusing on a particular behavioral subfield. Bamber (1993) addresses which outlets behavioral accounting research get published and what behavioral research topics generates the most interest in the subfields in accounting by examining behavioral publications from 1987 to 1991 using a two-dimensional classification approach (i.e. five accounting subfields and three topical classes). Findings suggest that there is an increasingly sophisticated use of psychology research and more reliance based on agency theory and experimental economics in behavioral accounting research.

In a recent review study (Birnberg 2011), a behavioral accounting framework and structure is proposed and the study provides development analysis using groups and organizations as basis. To be more specific, the article classified and organized prior research under individuals, small groups, organizations, and environmental conditions with aims at providing implications and support to behavioral accounting researchers in appreciating the insights of their research questions that could alternatively be addressed using another method or examining another issue with similarity in another accounting subfield.

#### 4.2.4 The Influence of Major Accounting Journals on BAR's Development

A stream of prior literature examined the development and research contribution of behavioral accounting research by surveying publications in a number of well-known accounting journals (Snowball 1986; Lord 1989; Burgstahler and Sundem 1989; Bamber 1993; Williams et al. 2006). Snowball (1986) examined the characteristics and influences of accounting laboratory experiments on human judgment or decisions from 1964-1984. The study employed citation analysis and other methods to evaluate the influences by reviewing publications in *The Accounting Review* (TAR), *Accounting, Organizations and Society* (AOS), and *Journal of Accounting Research* (JAR). Hofstede (1970) assessed the progress of BAR in a similar period, 1964-1973, by reviewing publications in *The Accounting* (TAR), *Journal of Accounting Research* (JAR), and *Empirical Research in Accounting: Selected Studies* using citation analysis. The study concluded that the evolutionary history of BAR and its sophistication, quality and insights imply that BAR is a viable and an important subset of accounting research that is flourishing.

Lord (1989) conducted a historical analysis on the development of behavioral thought in accounting from 1952-1981 by examining journal articles, books, events and individuals to infer what influenced the progression of this school of thought. The study by Burgstahler and Sundem (1989) reviewed characteristics of BAR published in *The Accounting Review* (TAR), *Journal of Accounting Research* (JAR), and *Accounting,*

*Organization and Society* (AOS) from the perspective of how it fits into an information economics view of the world and examined it from a non-behavioral researchers' aspect from 1968 to 1987. Four years later, BAR classifications and a historical analysis was conducted by Bamber (1993); the study found a close concentration of BAR in auditing as nearly half of the total BAR articles fall under the field.

The number and significance of BAR academic journals have observed to be diminishing in the U.S. accounting academy, as indicated by Reiter (1998). A recent status of BAR publications was assessed by Williams et al. (2006) where the article examined BAR in U.S. elites including AOS, JAE, TAR and JAR from 1963-1999 aiming at understanding the productivity of individual scholars and the formation process and changes of BAR elites over time. The study found that BAR seems to be in a recession in shaping the US accounting academy, however, the influence of a number of BAR scholars have been growing still through the service of editorial boards.

#### ***4.2.4.1 Accounting, Organizations and Society (AOS)***

*Accounting, Organizations and Society* (AOS) is a European accounting journal founded in 1976 and has been ranked in the study by Lowe and Locke (2005) as the first academic journal in a UK survey followed by TAR, JAR and JAE journals. Brown et al. (1987) examined the contributions of AOS from 1976-1984 and pointed out that AOS has published a substantial amount of BAR articles which is more than twice as many articles published in TAR and JAR combined during the examined time period. Lord (1989) found AOS to have shown more influence upon the stream of BAR

publications than any other outlet in the 1970s and has been the one non-US accounting journal that appeared to have made research contribution in BAR compared to others.

Burgstahler and Sundem (1989) indicated that AOS was found to publish more exploratory type of BAR and seems to favor the creativity demonstrated with the exploration. AOS publications discussed applications of behavioral theories to accounting and have exposed more U.S. accounting researchers to European research that emphasizes organizational and sociological approaches. AOS has been recognized as an excellent journal that dealt specifically with behavioral topics in accounting and has a major contribution on unifying the field and providing an outlet for quality research (Caplan 1989).

The distinctive characteristics of AOS to U.S. journals is evidenced in Williams et al. (1989) in that overall half of the 1990s emergent BAR group is comprised of only AOS publishers; AOS also has the most intellectual diversity and the greatest representation of BAR elite in its editorial boards (compared to U.S. elites). The journal represents a distinct set of literature while many U.S. elites represent a complementary set of literature; Academics who publish in AOS prolifically tend not to publish in the U.S. journals (Lee and Williams 1999; Lowe and Locke 2005).

#### ***4.2.4.2 Journal of Accounting Research (JAR), The Accounting Review (TAR), and Behavioral Research in Accounting (BRIA)***

In comparison with AOS, relevant publications of BAR in *The Accounting Review* (TAR) and *Journal of Accounting Research* (JAR) were found to conduct more testing



and revising models of behavioral theories. TAR has been the outlet that published the most behavioral accounting research in comparison with other accounting outlets prior to the 90s. Studies in TAR and JAR seemingly require more rigor that goes with the testing (Burgstahler and Sundem 1989). The founding of JAR in the 1963 was a significant step in supporting the development of BAR (Lord 1989). The first publication in JAR that is behavioral oriented was by Devine (1963) on the effect on conservatism on psychological reactions of readers of financial statement. A year later, JAR published the first empirical study in BAR, Dyckman (1964) in which applied simulation technique in an experiment to examine whether various alternatives available to accountant have an effect on business decisions within the financial data evolving from identical facts.

*Behavioral Research in Accounting* (BRIA) is a relatively younger journal originated in the 1989 with the purpose of increasing the awareness of BAR. The first published issue contributed to an overview and retrospect of the evolution and development of BAR in decades prior to the 1990s. This behavioral oriented journal has continuously been an influential and contributing outlet to the expansion of behavioral accounting research since.

#### **4.2.5 Accounting Education and Accounting Practice Influences on BAR**

The ultimate test of accounting research lies in its ability to influence the practice of accounting (Caplan 1989). The need for extensive and quality behavioral accounting research has been repeatedly recommended in the literature since 1960s. Prior studies have advocated that academic research effort and accounting practice has to be

connected in order to effectively progress further, that is, behavioral accounting research needs to be widely accepted and recognized by both academics and practitioners (Hofstedt and Kinard 1970; Caplan 1989).

Hofstedt and Kinard (1970) found behavioral accounting studies mainly originating from the academic branch (rather than practice) and that research findings were not translated into management actions. There is a clear need for behavioral accounting research and that there exist some problems in the application of research findings then. Accountants need to direct and participate in academic research, as recommended by Hofstedt and Kinard (1970). Relevant behavioral research in academic journals and practitioner's periodicals from 1960 to 1968 were examined in the study. Article titles were employed to measure content and were used to classify and determine whether “challenges to accounting” or “the future of accounting” elements were deemed as important in the prospective accounting field. Behavioral accounting research was found to be conducted mainly by theory-oriented researchers and reported mostly in academic journals while little was mentioned in practitioner's periodicals. Neither top management nor practicing accountants view behavioral research as particularly in critical need in the future. Academics' views have an opposite stand, however.

The challenges in the 1960s were that an overall perspective or strategy is lacking. Interested non-researcher (practitioner) lacks a way to relate one research effort to another. There is no incentive for researchers to progress from initial basic research findings toward applications. Existing behavioral relevant research was deemed to be

trivial, redundant, or needlessly contradictory or inconclusive. These difficulties led and caused the obvious gap between research and practice.

Approximately two decades later, Caplan (1989) provided views on a more recent behavioral accounting research field and yet indicated similar arguments on the minimal impact of behavioral research in accounting on practice. This in part may be due to the fact that organizational attitudes imbedded in the nature of the general society's management philosophy and practice is inconsistent with findings in academic studies. Research findings need to be embraced by practice to a greater extent. More prevalent use/conduct of case studies and the incorporation of behavioral issues as part of accounting curriculum are all in need to support BAR's development. The next section introduces the methodology used in the essay and implications of findings.

### **4.3 METHODOLOGY**

#### **4.3.1 Data Collection and Preprocessing - BAR Publications**

Several articles searches<sup>10</sup> were conducted manually in the *Ebscohost* academic research database to collect relevant research studies in behavioral accounting field prior to investigating the development and contribution in the field via research publications. The term “behavioral” in either article titles and/or article abstracts was queried in the database with a combination of the term “accounting” in publication source titles or “accounting” in article content. The same search was completed three times in different days to ensure the least possibility of manual errors.

---

<sup>10</sup> Article search was conducted three times in different days during May, 2013. The initial search returned 509 articles in total. After a data preprocessing stage of manual screening and cross checked, the ones with irrelevant topical area, notes, discussions, comments, editorials, book reviews were excluded. There were 391 main articles remaining and analyzed in this essay.

In terms of article collection time frame, there was no limitation set upon it as this essay attempts to collect an set of behavioral accounting studies and aiming it to be as extensive as it can be to infer the development trend in behavioral accounting research that matches the closest with field's status via *EbscoHost* database coverage. Article search results were cautiously reviewed to ensure no occurrence of duplicated manuscripts. In lining with prior research (e.g., ARD 1985; Brown et al. 1987), main journal articles were the target of historical content analysis<sup>11</sup>. A total of 391 behavioral accounting research manuscripts were included in this essay's analysis (see Appendix VI).

#### **4.3.2 Taxonomy Development and Classification**

The taxonomy used for classifying behavioral accounting research was created and developed by manually reviewing the 391 articles repeatedly and summarizing the main focus of each article to arrive at the four dimensional structure taxonomy (Appendix V).

This behavioral accounting research taxonomy breaks down to four main categories including *Research Methods*, *Accounting Area*, *Topical Behavioral Focus* and *Subtopical Behavioral Component*. There are 10 subcategories under the *Research Methods* taxon that identifies major type of the study, e.g., *Experiment*, *Survey*,

---

<sup>11</sup> Note that two commentaries and editorials were eventually included in the study. The content of those articles are not considered discussions of other original research articles or simply a introduction of certain journals' coverage in which issue. Those studies examines up-to-date research issues and do not directly critique another study in specific only. (i.e. Swieringa 1996 and Hunton et al. 2004) as the topic is original and is not considered critique of another research piece.

*Questionnaire*<sup>12</sup> and *Interview*. *Accounting Area* is decomposed into 8 subcategories, e.g., *Managerial Accounting*, *Auditing*, and *Accounting Information Systems*...etc.

The *Topical Behavioral Focus* category breaks down to 46 classes, e.g., *Decision Making and Judgment*, *Auditor-Client Relationship*, *Behavioral Accounting in Curriculum*, *Behavioral Accounting Framework*...etc. The subtopical behavioral component part of the taxonomy is created with an aim to provide additional information and support on the topical behavioral focus classification in determining its specific emphasis using an extensive set of 313 subclasses.

The complete classification of articles' research characteristics are shown in Appendix VI. The classification results were cross checked three times in three different days to eliminate possible errors and minimize potential inconsistency. The results analysis section includes a summary of findings for each of the four main taxonomic categories.

#### **4.3.3 BAR Publications Distribution by Year and Journals**

BAR articles are counted yearly, by journal and also by three two-decade periods. The distribution of articles across different accounting journals is also examined to infer which outlets serve as major contribution to the development of behavioral accounting research field.

To enable comparisons of research characteristics over time, results analysis sections breaks six decades into three temporal periods with a nearly two-decade<sup>13</sup> time frame.

The first time period (1950-1970) includes 22 behavioral accounting research articles,

---

<sup>12</sup> Recognizing that questionnaire is a popular type of survey instrument used in a number of studies, this chapter segregates it as a separate category from survey.

<sup>13</sup> The first two time periods include 21 years coverage. The last period includes 21.5 year as the articles collected in 2013 was only for half a year.

the second time period (1971-1991) analyzes 124 articles, and the last time period (1992-2013) includes 245 behavioral accounting articles.

## **4.4 RESULTS AND ANALYSIS**

### **4.4.1 Temporal Periods Distribution of Behavioral Accounting Research**

The article search in Ebscohost resulted in 391 articles published in 53 accounting journals from 1950-2013 (Figure 12). The trend of the total number of articles shows nearly a steady growth along the years. Figure 1 demonstrates BAR article count in every year and figure 13 illustrates the article count in every 5-year temporal periods<sup>14</sup>.

The first two articles regarding the early thought development of BAR was found in the early 50s and 60s. In line with Lord (1989), it was not until 1960 that the accounting literature started to include regular contributions discussing the behavioral aspects of accounting. BAR research took off in the subsequent periods and grown significantly with a slight fall back in the mid-late 1980s. The number of publications rose once again in the late-1990s and peaked in the late 2000s. In terms of individual year count of articles, 2011 is the top ranked year with the most number of publications 27 and is followed by 19 articles that were published in 2006.

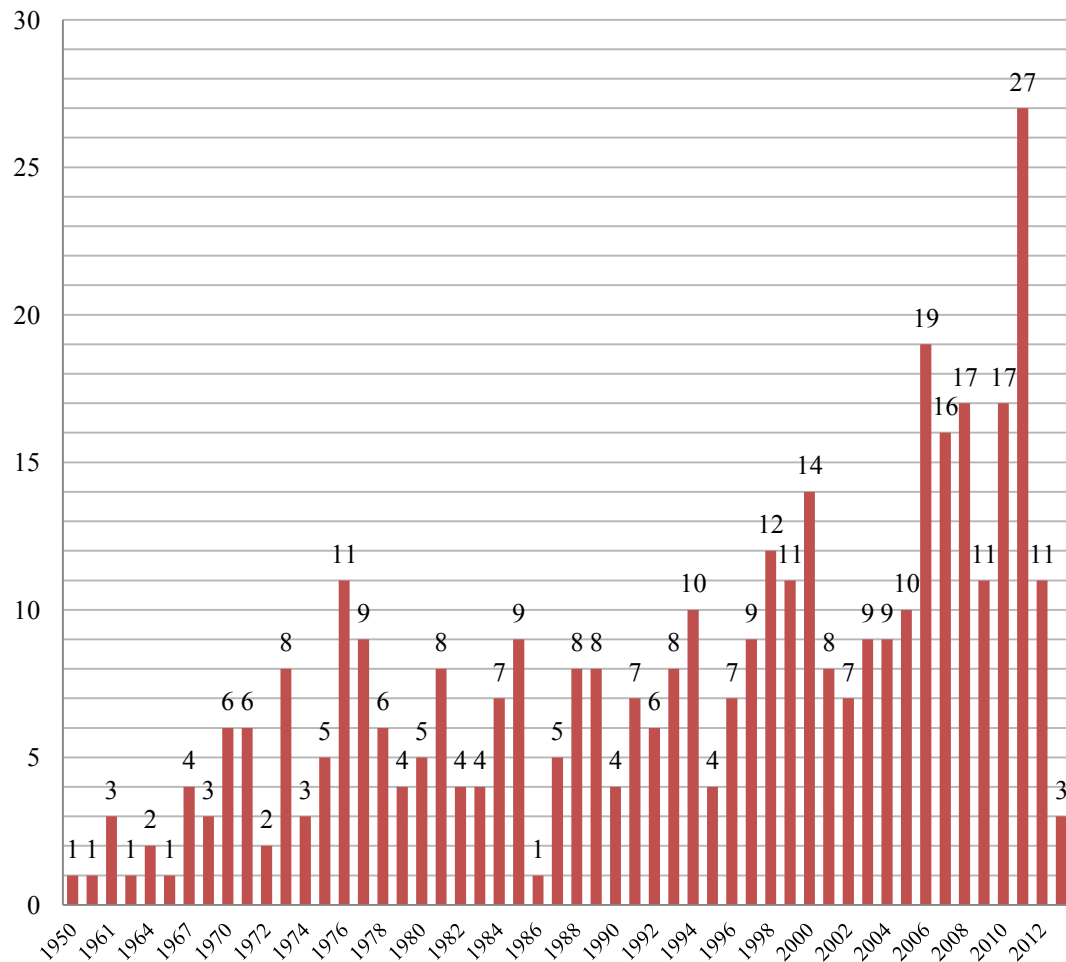
It is worth to note that since 2006, BAR articles have been reaching a level of research contribution that has never been observed in the past few decades. From 2006- 2010, 80 articles were published; and since 2011, 41 articles were published in only about 2.5

---

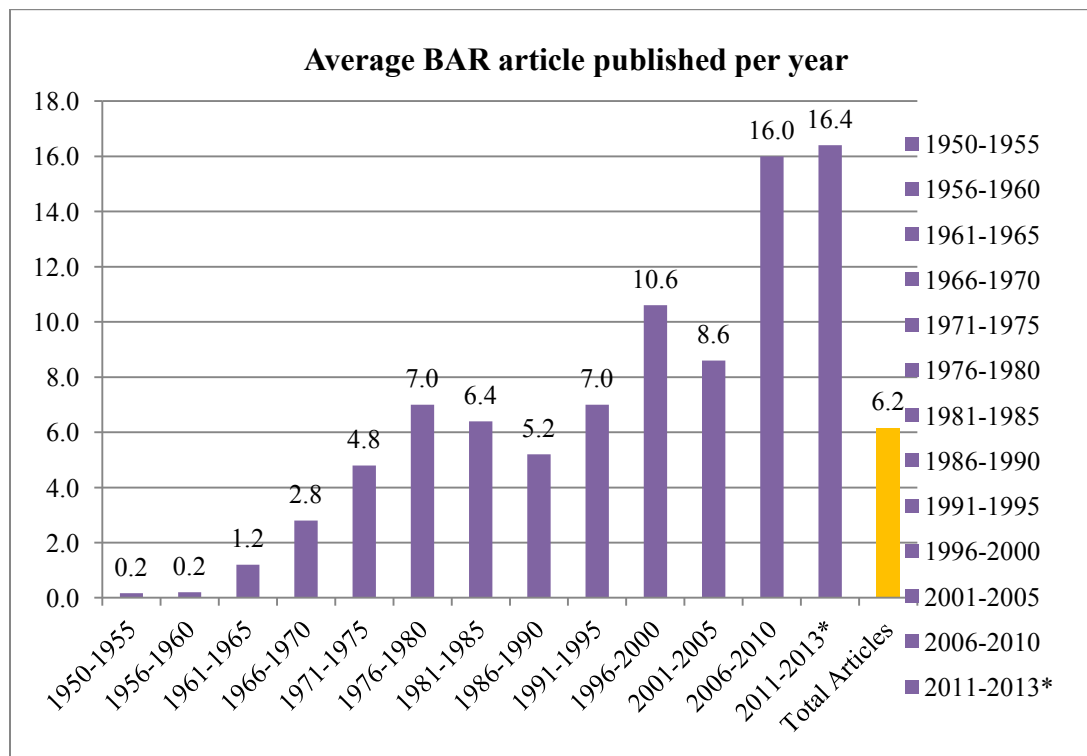
<sup>14</sup> The exceptions are the first bar covers 6-years and the last bar only covers 2.5 years to date (figure 13).

years. The most recent years (2011-2013) seem to show the most significant growth in BAR with an average publications of 16.4 articles per year. Compared to the yearly average 6.2 articles across all six decades, the recent average publication of 16.4 articles per year is considered a fairly high progress and expansion of the sample research articles collected in this study.

**FIGURE 12**  
**Yearly Distribution of Behavioral Accounting Research**



**FIGURE 13**  
**Temporal Periods Distribution of Behavioral Accounting Research**



#### 4.4.2 Journal Distribution of Behavioral Accounting Research

Of all the 391 BAR articles, majority of the articles are from academic publications source. Consistent with Lord (1989), *The Accounting Review* (TAR) published the most number of BAR articles in total over time, 65. However, considering TAR's starting year and total issues, the journal dates back to 1926 and holds the longest history of all ten journals identified in Table 28; its average BAR publications per issue is 0.17 and only ranks the 6th of the ten journals. *Behavioral Research In Accounting Journal* (BRIA) published 47 publications and ranks the 1st considering the number of issues and lifetime of the journal since 1989. The record is then followed by *Journal of Information Systems* (JIS) with 18 published articles, 0.32 per issue; and *Auditing: A*



*Journal of Practice and Theory* (AJPT) ranks the 3rd a total of 19 BAR articles published and 0.24 per issue.

The 4th ranked journal is *Accounting, Organization and Society* (AOS) with 43 publications and an average of 0.21 publications per issue and is followed by *National Tax Journal* with 35 articles ranking the 5th. *Journal of Accounting Research* (JAR) published 18 BAR articles and *Contemporary Accounting Research* (CAR) 13 articles. Of the five highly regarded journals (i.e., TAR, JAR, JAE, AOS and CAR), *Journal of Accounting and Economics* (JAE) is the journal that published the least BAR articles as compared to the other top ranked journals, with only a record of 2 articles over six decades.

Considering *Issues of Accounting Education* (IAE), *International Journal of Accounting* (IJA) and *Managerial Auditing Journal* (MAJ) along with the aforementioned journals, these top 10 ranked journals account for nearly three fourths of the total BAR publications. The remaining one quarter of the articles are published in 42 different journals in accounting, managerial, auditing and general business field with publications of less than 9 articles.

#### **4.4.3 Research Characteristics**

To aid the understanding of the characteristics development of behavioral accounting research, the articles are classified along four dimensions - *research methods*, *accounting area*, *behavioral topical focus* and *behavioral sub-topical focus*. A summary of the results are as follows.

**TABLE 28**  
**Top 10 Journals With Behavioral Accounting Publications**

Journal Titles	Journal Starting Year	Avg. Yearly Publication	Total Issues	Average Publication /Issue	Rank Publication /Issue	Count of Total Publications
Accounting Review	1926	0.74	375	0.17	6	65
Behavioral Research in Accounting	1989	1.92	34	1.38	1	47
Accounting Organizations & Society	1976	1.15	208	0.21	4	43
National Tax Journal	1965	0.72	196	0.18	5	35
Auditing	1981	0.58	79	0.24	3	19
Journal of Accounting Research	1963	0.36	171	0.11	10	18
Journal of Information Systems	1986	0.65	56	0.32	2	18
Contemporary Accounting Research	1984	0.44	95	0.14	8	13
Issues in Accounting Education	1983	0.43	87	0.15	7	13
International Journal of Accounting	1965	0.21	145	0.07	11	10
Managerial Auditing Journal	2003	0.95	90	0.11	9	10

#### **4.4.3.1 Research Methods**

The top three ranked research method is *Analytical Internal Logic*, *Experiment*, and *Secondary Review*. *Analytical Internal Logic* category consists of studies that

incorporate qualitative reasoning approach, framework or conceptual ideas studies. This category takes up about one third of the total BAR articles.

The second popular research method in BAR is the experimental approach which is commonly seen in, for example, decision making and judgment research or perception of certain beliefs or attitudes. This category consists of 24% of the research. The category that follows is *Secondary Review* that takes up 13.3% of the studies which are a survey of other articles published in the past. Adding up the two categories, *Survey* and *Survey-Questionnaire* will allow us to identify that about 13% of the articles examines behavioral accounting research issues by using data collected by distributing designed questionnaire or other types of survey instrument. Popular survey subjects identified in these studies are big-four auditors, internal auditors, accountants, students, CEOs and/or managers of multiple public traded companies, and accounting professors/faculty.

The percentage distributions of *Research Methods* applications in behavioral research articles longitudinally over three temporal periods are shown in Table 30. During 1950-1970, a significant number of studies applied a normative or analogic approach to derive their research arguments, the *Analytical Internal Logic* category accounts for 72.73% of the total articles in the period. *Experiment* is ranked 2nd place with an apparent less share, 13.64%. This finding complements with the fact that this time period is considered the beginning stage of behavioral accounting research and many studies were initiating ideas and research opportunities, proposing behavioral research frameworks, and identifying research scopes at that age.

**TABLE 29**  
**Research Method & Accounting Area Count and Percentage**

Research Method	Count	%
Analytical Internal Logic	129	32.99%
Case	6	1.53%
Empirical Archival	48	12.28%
Experiment	95	24.30%
Field	3	0.77%
Interview	5	1.28%
Secondary Review	52	13.30%
Simulation	2	0.51%
Survey	25	6.39%
Survey-Questionnaire	26	6.65%
Grand Total	391	100.00%
Accounting Area	Count	%
Accounting Education	22	5.63%
Accounting Information Systems	17	4.35%
Auditing	74	18.93%
Financial Accounting	34	8.70%
General Behavioral Accounting	71	18.16%
Government Accounting	3	0.77%
Managerial Accounting	106	27.11%
Taxation	64	16.37%
Grand Total	391	100.00%

**TABLE 30**  
**Research Methods - Percentage Distribution Over Temporal Periods**

Research Methods											
Year/ Methods	Analytical Internal Logic	Case	Empirical Archival	Experiment	Field	Interview	Secondary Review	Simulation	Survey	Survey- Questionnaire	Grand Total
1950-1970	72.73%	0.00%	0.00%	13.64%	4.55%	0.00%	9.09%	0.00%	0.00%	0.00%	100.00%
1971-1991	42.74%	0.81%	4.03%	25.00%	0.81%	0.81%	13.71%	0.81%	2.42%	8.87%	100.00%
1992-2013	24.49%	2.04%	17.55%	24.90%	0.41%	1.63%	13.47%	0.41%	8.98%	6.12%	100.00%

In the second time period (1971-1991), *Experiment* based studies account for 25% of the share which shows a growth pattern since the first time period and still ranked the 2nd place. *Analytic Internal Logic* category remained the first place, however, the proportion of articles decreased significantly to 42.74% compared to the first two

decades. The 3rd ranked category is *Secondary Review* in which articles analyze literature in prior time periods. This class has increased its accounted share in the second time period and slightly dropped in the last period.

During 1992-2013, *Experiment* has become the most popular research method of behavioral accounting research with nearly 25% of the studies applying it. This rank is closely followed by *Analytical Internal Logic* category which accounts for 24.9% of the total studies. This class has continuously decreased its share along the growth of the behavioral accounting field. Recent studies have been utilizing a variety of approaches to address behavioral research questions and issues of interest. *Empirical Archival* behavioral studies category is the ranked the 3rd and has expanded from 4% in the prior period to 17.55%. Other research method changes worth mentioning is that *Survey* and *Survey-Questionnaire* categories altogether accounts for more than 15% of the studies. The survey instrument approach has been more accepted and applied in research over time.

Another interesting finding is that there is nearly 5% of *Field* studies in the first two decades, however, this field study approach has barely been used in the subsequent four decades of behavioral accounting research. On the other hand, there is a slim increase in the proportion of *Case* studies type of research conducted over time.

#### **4.4.3.2 Accounting Area**

Analyzing by subclasses, the main accounting area that BAR articles fall under is the *Managerial Accounting* field with 27.1% coverage. *Auditing* area follows with 18.9%

articles incorporated and the 3rd ranked category is the *General Behavioral Accounting* category with 18.1% articles included (see Table 29).

The articles that fall under the *General Behavioral Accounting* category often illustrates a normative qualitative approach in introducing research strategies, experimental technique or what ought to be in the accounting field that relates to behavioral accounting or can be used in behavioral accounting research. Some articles critique the progression of BAR in a particular time frame and/or provide research opportunities that are worth considered and investigated by future academicians.

Longitudinal analysis of over six decades of *Accounting Area* distribution is shown in Table 31. In the first two decades (1950-1970), more than one third of the studies fall under *General Behavioral Accounting* area which is considered quite intuitive as it is in line with the emerging status of the broad behavioral accounting field. 27.27% of the studies are in the *Managerial Accounting* area and is followed by the *Accounting Education* field. This observed distribution has changed in the subsequent four decades.

**TABLE 31**  
**Accounting Area - Percentage Distribution Over Temporal Periods**

<u>Accounting Area</u>									
Year/ Acctg. Area	Accounting Education	Accounting Information Systems	Auditing	Financial Accounting	General Behavioral Accounting	Government Accounting	Managerial Accounting	Taxation	Grand Total
1950-1970	18.18%	4.55%	9.09%	0.00%	36.36%	0.00%	27.27%	4.55%	100.00%
1971-1991	8.87%	0.81%	22.58%	4.84%	20.97%	0.00%	34.68%	7.26%	100.00%
1992-2013	2.86%	6.12%	17.96%	11.43%	15.10%	1.22%	23.27%	22.04%	100.00%

In the 1971-1991 period, *Managerial Accounting* focused studies grew and ranked first place, accounting for 34.68% of all the articles. *Auditing* (22.58%) is ranked 2nd and

*General Behavioral Accounting* appears as one of the top 3 categories that holds nearly one fifth of the share which decreased from the proportion in the earlier two decades.

*Managerial Accounting* is once again ranked first place in the last period (1992 to 2013) with 11% less than the prior time period, however. The closely followed category is *Taxation* (22.04%) which has increased its share significantly in the third period. *Auditing* area is ranked third and accounts for about 18% of the articles. Over time, it is also observed that behavioral accounting articles in the *Accounting Education* field gradually decreased while *Taxation*, *Financial Accounting*, *Government Accounting*, and *Accounting Information Systems* increased.

#### **4.4.3.3 Topical Behavioral Focus**

The overall top five classes of the topical behavioral focus taxonomic category are *Decision Making and Judgment* (20.20%), *Historical Development/Critique* (11.51%), *Taxpayers' Behavioral Response* (9.97%), *Behavioral Accounting Framework* (7.16%), and *Behavioral Research/Experiment Design* (6.91%) as shown in Table 32. Many of these categories cut across auditing and managerial accounting areas, especially in the *Decision Making and Judgment* and *Behavioral Research/Experiment Design* behavioral focuses. Many studies focuses on understanding the elements, determinants, processes before arriving at the final decision and judgment phase of various topics. In terms of *Behavioral Research/Experiment Design*, researchers have strived to improve the experimental conducting and operating issues such as the usage of methods, techniques, settings and subject selections over time in attempt to arrive at the most refined behavioral experimental results and widen its practical application value.

**TABLE 32**  
**Topical Behavioral Focus Count and Percentage**

Topical Behavioral Focus					
	Count	%		Count	%
Decision Making And Judgment	79	20.20 %	Accounting Workload	3	0.77%
Historical Development/Critique	45	11.51 %	Auditor Learning	3	0.77%
Taxpayers' Behavioral Response	39	9.97%	Behavioral Intentions	3	0.77%
Behavioral Accounting Framework	28	7.16%	Employees' Behavior/Performance	3	0.77%
Behavioral Research/Experiment Design	27	6.91%	Fraud	3	0.77%
Behavioral Accounting In Curriculum	15	3.84%	Students' Behavior	3	0.77%
Budget	14	3.58%	Accounting Innovation/ Changes And Diffusion	2	0.51%
Auditor-Client Relationship	10	2.56%	Assurance	2	0.51%
Behavioral Finance And Accounting	10	2.56%	Audit Fees	2	0.51%
Performance	10	2.56%	Audit Litigation	2	0.51%
Managers' Behavior	8	2.05%	Communication	2	0.51%
Cultural/Gender Differences	7	1.79%	Perceptions	2	0.51%
Standard Setting	7	1.79%	Behavioral Aspects Of Earned Income Tax Credit	1	0.26%
Behavioral Biases	6	1.53%	Behavioral Aspects Of Fair Value Accounting	1	0.26%
Performance Evaluation	6	1.53%	Behavioral Aspects Of Federal Student Aid	1	0.26%
Activity-Based Costing	5	1.28%	Behavioral Aspects Of Student Aid Application	1	0.26%
Agency Theory	5	1.28%	Behavioral Conformity, Norms And Controls	1	0.26%
Audit Quality And Performance	5	1.28%	Causal Reasoning	1	0.26%
Transfer Pricing	5	1.28%	Neuroeconomics	1	0.26%
Consumer/Users' Behavior	4	1.02%	Practitioner-Client Relationship	1	0.26%
Cost Control/Variances	4	1.02%	Collective Bargaining	1	0.26%
Management Control System	4	1.02%	Behavioral Aspects Of Book-Tax Conformity	1	0.26%
Organization Behavior	4	1.02%	Grand Total	391	100.00 %
Systems/Tools	4	1.02%			



Articles under *Taxpayers' Behavioral Response* typically illustrate the effect of different tax reforms, tax policies, tax rate changes on investors, individual taxpayers and business/not-for-profit organizations. Studies that fall under the *behavioral accounting framework* often review and promote certain behavioral accounting conceptual theme and suggest where the field should be heading and in which direction may best benefit the field. The categories that ranked from 6th to 10th are *Behavioral Accounting in Curriculum* category, with 15 studies; *Budget* class with 14 articles; and 10 articles each for the categories of *Auditor-Client Relationship*, *Behavioral Finance and Accounting*, and *Performance*.

*Behavioral Accounting In Curriculum* category typically includes studies that uses an educational standpoint, urging the importance and necessity of introducing behavioral oriented course materials in course curriculum content or provides a case/scenario that can be implemented in class to provide guidance to students in better understanding of the processes, settings, judgment/decision making operations in a variety of accounting topics.

*Budget* category includes a number of behavioral effects classes such as the budget settings, budget processes, manager's/employee's behavior impact on budgeting variances and controls..., etc. The *Auditor-Client Relationship* category often includes articles that examine the impact of auditor behavior on client's perceptions, how the performance and/or attitude of clients subsequently affect auditor's perceived risk assessment towards the client.

*Behavioral Finance and Accounting* category covers studies that investigate investors' behavior and or stock market's behavior in specific settings. *Performance* topical area classifies the studies with the main goal of understanding the detailed factors, determinants, variances and reasoning underlying these areas of firm or employees' performance.

Analyzing the popular topical behavioral focuses in the three two-decade periods, it shows that *Behavioral Accounting Framework* (27.27%), *Behavioral Accounting In Curriculum* (18.18%) and *Historical Development/Critique* (18.18%) were the top ranked three categories during 1950-1970. In the following two decades (1971-1991), *Decision Making and Judgment* class accounted for nearly 30% of the studies. There was still a decent share of *Historical Development/Critique* articles observed in this period (15.32%) and this class is followed by *Behavioral Research/Experiment Design* class, ranking 3rd place and accounts for 8% of the studies. In the most recent two decades (1992-2013), *Decision Making and Judgment* (17.14%), *Taxpayers' Behavioral Response* (13.88%), *Historical Development/Critique* (8.98%), and *Behavioral Research/ Experiment Design* (6.12%) are the top ranked behavioral focuses.

Overall, it is worth noting that articles published in the first time period are only able to be classified under 10 behavioral focus classes, however, in the subsequent two decades (1971-1991), articles were populated under 22 different topical behavioral focus categories. In the most recent period (1992-2013), articles are classified and identified in 43 different behavioral focus classes. This overall finding of the topical focus distribution implies that behavioral accounting field has been growing in a variety of

directions and has been expanding its research scope over time. The areas of focus that has been identified as having continuous in depth research progress over six decades are the following: *Decision Making and Judgment, Taxpayers' Behavioral Response, Historical Development/Critique, Performance, Behavioral Accounting Framework, Behavioral Research/Experiment Design, Students' Behavior, and Behavioral Accounting in Curriculum.*

There are also a number of new behavioral focuses that only appeared in the most recent two decades (see Table 33), namely, *Accounting Workload, Activity-Based Costing, Assurance, Audit Fees, Audit Quality and Performance, Neuroeconomics, Perceptions, Practitioner-Client Relationship, Behavioral Biases, Behavioral Conformity, Norms & Controls, Behavioral Intentions, Causal Reasoning, Consumer/Users' Behavior, Employees' Behavior/Performance, Fraud, Behavioral Aspects of Book-Tax Conformity, Behavioral Aspects of Earned Income Tax Credit, Behavioral Aspects of Fair Value Accounting, Behavioral Aspects of Federal Student Aid, and Behavioral Aspect of Student Aid Application.* These new classes are expected to lead to forthcoming research.

**TABLE 33**  
**Topical Behavioral Focus - Percentage Distribution Over Temporal Periods**

Topical Behavioral Focus/Year	1950-1970	1971-1991	1992-2013
Accounting Innovation/Changes And Diffusion	4.55%	0.81%	0.00%
Accounting Workload	0.00%	0.00%	1.22%
Activity-Based Costing	0.00%	0.00%	2.04%
Agency Theory	0.00%	0.81%	1.63%
Assurance	0.00%	0.00%	0.82%
Audit Fees	0.00%	0.00%	0.82%
Audit Litigation	0.00%	0.81%	0.41%
Audit Quality And Performance	0.00%	0.00%	2.04%
Auditor Learning	0.00%	1.61%	0.41%
Auditor-Client Relationship	0.00%	2.42%	2.86%
Behavioral Accounting Framework	27.27%	7.26%	5.31%
Behavioral Accounting In Curriculum	18.18%	5.65%	1.63%
Behavioral Aspects Of Book-Tax Conformity	0.00%	0.00%	0.41%
Behavioral Aspects Of Earned Income Tax Credit	0.00%	0.00%	0.41%
Behavioral Aspects Of Fair Value Accounting	0.00%	0.00%	0.41%
Behavioral Aspects Of Federal Student Aid	0.00%	0.00%	0.41%
Behavioral Aspects Of Student Aid Application	0.00%	0.00%	0.41%
Behavioral Biases	0.00%	0.00%	2.45%
Behavioral Conformity, Norms And Controls	0.00%	0.00%	0.41%
Behavioral Finance And Accounting	0.00%	1.61%	3.27%
Behavioral Intentions	0.00%	0.00%	1.22%
Behavioral Research/Experiment Design	9.09%	8.06%	6.12%
Budget	0.00%	5.65%	2.86%
Causal Reasoning	0.00%	0.00%	0.41%
Collective Bargaining	0.00%	0.81%	0.00%
Communication	4.55%	0.00%	0.41%
Consumer/Users' Behavior	0.00%	0.00%	1.63%
Cost Control/Variations	0.00%	3.23%	0.00%
Cultural/Gender Differences	0.00%	0.81%	2.45%
Decision Making And Judgment	0.00%	29.84%	17.14%
Employees' Behavior/Performance	0.00%	0.00%	1.22%
Fraud	0.00%	0.00%	1.22%
Historical Development/Critique	18.18%	15.32%	8.98%
Management Control System	0.00%	0.81%	1.22%
Managers' Behavior	0.00%	2.42%	2.04%
Neuroeconomics	0.00%	0.00%	0.41%
Organization Behavior	0.00%	2.42%	0.41%
Perceptions	0.00%	0.00%	0.82%
Performance	4.55%	0.81%	3.27%
Performance Evaluation	4.55%	0.00%	2.04%
Practitioner-Client Relationship	0.00%	0.00%	0.41%
Standard Setting	0.00%	1.61%	2.04%
Students' Behavior	4.55%	0.81%	0.41%
Systems/Tools	0.00%	0.81%	1.22%
Taxpayers' Behavioral Response	4.55%	3.23%	13.88%
Transfer Pricing	0.00%	2.42%	0.82%
Grand Total	100.00%	100.00%	100.00%

#### **4.4.3.4 Topical Behavioral Focus and Subtopical Behavioral Component Analysis**

The number of *Subtopical Behavioral Component* classes listed under each *Topical Behavioral Focus* category varies from 1 to 73 classes. For example, *Decision Making and Judgment* category is able to be broken down into 73 behavioral components, *Taxpayers' behavioral response* includes 39 subclasses, *Historical Development/Critique* consists of 28 subclasses, however, *Auditor Learning* and *Fraud* topical areas are only able to be decomposed into 3 classes each. A number of *Topical Behavioral Focus* categories are able to be assigned a lot more subclasses than others, implying that these topics in behavioral accounting research are more populated than others and are developing as well as contributing to the field in various dimensions as identified in the classifications results (see Appendix VII). *Auditor-Client Relationship*, *Behavioral Accounting Framework*, *Behavioral Accounting In Curriculum*, *Behavioral Research/Experiment Design*, *Budget*, and *Performance* classes are the topical behavioral focuses that contains more than 10 subtopical behavioral component as well.

Cross examining classification results by behavioral topical focus and subtopical behavioral components enable identification of the specific areas of behavioral research that have been relatively more extensively developed over time. Among which, there are 18 articles which accounts for 4.6% of *Behavioral Research and Experiment Design* category focusing on the means to conduct behavioral studies and create experiments at large<sup>15</sup>. This class is ranked as the most popular of all the subtopical behavioral components.

---

<sup>15</sup> The "N/A" classification shown in the sub-topical area of Table 4 refers to studies that fall under a general category of its topical behavioral focus and in a broad sense where the sub-component of the study is not apparent to be identified.

Under the *Historical Development/Critique* topical behavioral focus category, four classes are revealed as the top five popularly researched subtopics. *Behavioral Accounting Research* class is ranked the 2nd (2.81%), including 11 studies. These articles examine the general development of behavioral accounting research historically and provide personal views or specific aspects of critique that surrounds a certain time frame or research issue qualitatively. There are three studies under the *Behavioral and Organizational Research* class that review research in the organizational and managerial area, this class ranks the 5th. *Decision Making and Judgment* and *Management Control* classes also each include three articles. These studies review and critique the literature in the decision making and judgment area and management control field in specific.

The 3rd ranked popular behavioral subtopical area is on the *Impact from Tax Changes* class of the *Taxpayers' Behavioral Response* topical focus with 10 studies on adjustments and amendments of tax rate or tax reforms and its subsequent behavioral effect/response from taxpayers. The overall 4th ranked class is the *Impact from Presentation Methods* under the *Decision Making and Judgment* topical focus. These four articles address the effect of different means of stating and illustrating crucial information has upon the behavior of judgment and decision making.

The remaining subtopical components that also rank as the 5th (including 3 articles) as those under the *Historical Development/Critique* area include the *Impact from Behavioral Accounting Research* class under *Standard Setting* topical focus, *Implementation and Behavioral Variables* class under *Activity-Based Costing* category,

the general<sup>16</sup> class in the *Behavioral Accounting In Curriculum, Behavioral Context and Implications* under the *Transfer Pricing* topical focus area. These classes account for the same proportion (0.77%) as the *Behavioral and Organizational Research, Decision Making and Judgment*, and *Management Control* classes under *Historical Development/Critique* category.

#### 4.5 CONCLUSION AND IMPLICATIONS

This essay first provides an overview of the progression of behavioral accounting research field chronological with discussion on major journal contributions as well as on accounting education and practice influences. The second part of this essay systematically reviews the characteristics of behavioral research using a comprehensive research taxonomy developed in this study. Comparisons are enabled across accounting subfields, research methods, behavioral topical focus and sub-topical focus in various time frames.

The taxonomic classification findings show that the apparent topical behavioral focus classes with the most steady and continuous research progress include *Behavioral Accounting Framework, Behavioral Accounting in Curriculum, Behavioral Research/Experiment Design, Decision Making and Judgment, Historical Development/Critique, Performance, Students' Behavior* and *Taxpayers' Behavioral Response*. Publications in these topical areas appear in all three time periods across six decades. In the most recent two decades, there are many topical areas that have been newly formed, suggesting that behavioral accounting research scope is certainly

---

<sup>16</sup> Refers to the studies classified under N/A.

widening over time. These new classes have the potential to form into more mature topical clusters and lead to new research fronts in the near future.

It is important to recognize that all research about human behavior is characterized by considerable uncertainty (Caplan 1989). Limitations are unavoidable and lie in the fact that the index database of behavioral articles provided may be extensive, however, may not be fully comprehensive. The research articles examined are limited to the incorporated journal sources. However, this classification approach applied to the extant literature analysis altogether still provides us an understanding of the development and status quo of behavioral accounting research over time.

This essay observed various topical areas and behavioral focuses that have emerged in six decades and enlarged along three temporal periods. Applying multiple bibliometrics methods, the main characteristics of behavioral accounting research have been revealed, research accomplishments also provide educational implications in supporting graduate level courses in understanding the development and key characteristics over time. Scholars new to the field will be able to reach valuable information from the behavioral accounting research taxonomy and classification results to efficiently comprehend the critical subareas of contribution in the field. Based upon the observed growth in topical areas and subtopical components in behavioral accounting research, findings imply that behavioral accounting research field has been steadily growing along the years. Contributions are mainly found in the *Managerial*, *Auditing*, *General Behavioral Research* and *Taxation* subareas within accounting discipline. The main topical accounting areas, research methods, behavioral focuses and components have all varied along the years. However, it is observed that the trend of the behavioral



accounting publications' quantity has been increasing, the scope of the research issues in terms of the topical variety has been expanding, and there exist a number of subareas that have continuously been flourishing more in depth. The future lying ahead of behavioral accounting research field seems quite viable and is expected to bear fruitful and promising contributions.

## CHAPTER 5

### CONCLUSION AND IMPLICATIONS

#### 5.1 A Summary of Main Findings in Three Essays

This dissertation consists of three essays on examining the historical development of accounting research characteristics and citations' intellectual structure of publications in *The Accounting Review* (TAR), the continuous auditing literature, and behavioral accounting literature. The following concludes with a summary of findings in all three essays as well as future research and implications.

The first essay examines the attributes of the leading academic research published in *The Accounting Review* (TAR) and also investigates its intellectual structure from 1994 to 2008. Preliminary findings reveals that the topical area of research published in TAR are dominated in financial accounting area (54.89%) while its grounded theory is drawn from accounting discipline (45.86%) at most and economics and finance disciplines ranked as second (20.89%) in the full sample period. Results of the school of thought taxonomic class suggest that statistical modeling on efficient market hypothesis is the main category that TAR contributes to. Archival-primary (48.12%) and quantitative-regression (53.76%) methods are the most popular ones used by TAR researchers among the various methods and reasoning techniques.

In addition, content analysis results also imply that the application of qualitative research method has increased in TAR research which supports another finding that behavioral area has gradually increased its importance in the school of thought category. On the other hand, research methods applied in leading accounting research

has become more focused on certain methods while theories that ground TAR research has become more diversified.

In the first period of co-citation analysis (1994-1998), eight research groups are identified as the main areas that formed the accounting thoughts in TAR publication. The topical area of the largest structure is on the accounting choices, performance and compensation literature. In the second period (1990-2003), six main clusters identified including 1) earnings- forecasts, market response and earnings management, 2) agency theory, performance and compensation, 3) firm disclosures and litigations, 4) tax and capital planning, 5) earnings properties: time-series and cross-section, and 6) valuation measurements. The largest research network that TAR publication grounded theory and thoughts in the earnings-relevant literature.

There are four main research clusters identified in the third period (2004-2008), the largest research cluster is on the topical area of accruals anomaly and earnings management issues. Findings suggest that the four main clusters of research groups that influence research in TAR in this period are strongly focused on financial accounting topics. The dominated research methods and attributes applied in the streams of research are archival primary data, empirical and quantitative statistical methods.

In general, findings in the first essay are potentially limited by the academic accounting journal of interest and the time frame chosen for examination. Future research can expand results of this study by investigating a broader scope of accounting outlets or examining a different time period of accounting research development.

The second essay of this dissertation first presents a comprehensive review of continuous auditing research by providing an overview of the emergence and growth of continuous auditing literature since the late 1980s, classifying the content of continuous auditing research on the basis of four research characteristics, and applying citation and co-citation analyses to identify influential research and scholars within the field as well as revealing main reference clusters that contribute to the formation of the continuous auditing field in three periods.

Upon conducting a longitudinal content analysis, citations and co-citations analyses, findings suggest that continuous auditing studies' research method usage mainly fall under the normative analytical category longitudinally. The second and third popular research methods categories are empirical survey and case studies. The topical areas of interest include the general continuous auditing, continuous controls monitoring and enabling technologies areas. To be specific, the development of systems/models that assist continuous audit, the demand and environment that trigger the growth of continuous audit field, and the introduction and application of technologies that enables and facilitates continuous audit are the specific areas of emphasis identified as highly weighted during the development of continuous auditing research thus far. In terms of the geographical area that is interested in continuous auditing research, a significant part of the research work was developed in the United States, which is followed by a much lesser share in Asian and Europe countries.

The intellectual structure findings arrived from the citations and co-citations analysis suggest that the emerging stage of continuous auditing field stems from the early 1980s. During the period of 1983-1999 there were very few research articles relevant to the

continuous auditing concepts. During the period of 2000-2007, three main research clusters was identified as influential on the formation of continuous auditing, including “Principles of Continuous Auditing, Monitoring & Assurance,” “Online & Internet Financial Reporting,” and “E-commerce & Systems Assurance.” In the subsequent period of 2008-2011, “Principles of Continuous Auditing, Monitoring & Assurance II,” “Audit Technologies Practice & Perceptions,” and “Online Financial Reporting & XBRL” were shown as the co-citation clusters that has the most impact on the recent continuous auditing research contribution.

It is worth noting that there are ten joined references in the two clusters of “Principles of Continuous Auditing, Monitoring & Assurance” in the developing periods, i.e., Groomer and Murthy (1989); Vasarhelyi and Halper (1991); Kogan et al. (1999); Alles et al. (2002); Rezaee et al.(2002); Vasarhelyi (2002); Searcy and Woodroof (2003); Vasarhelyi and Greenstein (2003); Alles et al. (2004); Vasarhelyi et al. (2004). The implications of the highly cited references is that it has been recognized in the academia as key manuscripts, and have been impacting new research thought repeatedly for more than a decade. The aforementioned manuscript will serve as fruitful education curriculum materials in graduate level or advanced undergraduate level accounting information systems coursework as it is considered the grounding of the field's development.

With the growing need of timely financial information and assuring control data integrity, academia and the accounting profession have strived to address this demand and opportunity for audit tasks and process to be performed timely and automatically. The continuous collaboration and feedback between research and practice is the main

key to enable flourishing progress within the continuous auditing field and subsequently meeting emerging requirements in accounting/auditing practice and the general business realm with regards to accounting information systems and technological concerns.

A chronological overview of the historical development and characteristics of behavioral accounting research are addressed in the third essay of this dissertation. A comprehensive taxonomy with four dimensions was created to shed light on the status quo of behavioral accounting field by systematically analyzing studies with respect to its research methods, accounting area, topical behavioral focus and sub-topical behavioral components. Findings are also cross compared in different time frame and across the four categories.

By comparing classification results, the trend of the development of behavioral topical areas, behavioral components, research methods, accounting areas of focus have been revealed. Behavioral studies tend to use more Analytical Internal Logic, Experiment, and Secondary Review research methodological approaches. The accounting subareas that have conducted the most behavioral studies are Managerial, Auditing, General Behavioral Research and Taxation subareas. The identified popular behavioral topical areas of interest include studies on *Behavioral Accounting Framework*, *Behavioral Accounting in Curriculum*, *Behavioral Research/Experiment Design*, *Decision Making and Judgment*, *Historical Development/Critique*, *Performance*, *Students' Behavior* and *Taxpayers' Behavioral Response* categories.

Over time, there are a number of topical areas that have shown the most number of expanding underlying subfields which includes *Auditor-Client Relationship*, *Behavioral Accounting Framework*, *Behavioral Accounting In Curriculum*, *Behavioral Research/Experiment Design*, *Budget*, and *Performance* topics. The many recent emerging topics suggest that behavioral accounting field is certainly viable and has been growing continuously in terms of the number of publications, the variety of topical/subtopical areas and the actual development progress in each subfield. The scope of behavioral accounting research has especially been expanded greatly over the past four decades.

The overall trend of the observed behavioral accounting research implies that the field is still in the process of eagerly exploring, generating, and examining new areas of studies. Future research is not only expected to flourish and grow beyond the current research scope but also to build more in depth findings to strengthen the younger topical areas. The field of behavioral accounting research seems to be heading towards a fruitful and promising tomorrow. A summary of the key contributions and findings in all three essays are shown in Table 34, which provides detail information on the analyzed research time frame, applied bibliometric techniques, used database sources, and arrived main findings.

## **5.2 Limitations, Future Research and Implications**

The potential limitations of this dissertation lie in the possible classification inconsistency issue that could take place during manual classifications as in prior literature (e.g., Nobata 1999) and in the manual preprocessing of citations of research

articles. This part of the analysis by nature yet require a solid effort from manual processing and sorting in order to arrive at the final classifications and structural development results. Classification results provide readers the ability to locate and reach topics of articles that fall under a specific area of a discipline in a more efficient manner, however, the process does involve human judgment and decision making. Different experts or researchers could possibly classify an article with varied classifications; same expert could also potentially apply slightly different criteria during classifications from time to time if without caution. Similar to how journal articles are now easily retrieved from online academic databases, it is expected in the near future that there would be more advanced and automated techniques and online platforms developed to enable prompt reference extraction, cross-check of manual classification inputs with automatic classification results as bibliometric applications continue to expand and grow. Improvements on the research methodological process as illustrated in this dissertation could lead to more integrated usage on understanding issues that joints accounting historical topics with scholarly collaboration between fields and potentially communications between academics and practitioners.

Other limitation may exist in the tradeoff between manual effort and research scope. While the ideal case of all three essays would be to incorporate the widest scope of literature from all years and from every publicly available online academic database source for complete analyses, this research is restricted by the possible scope of literature due to the fact that manual effort is heavily involved in the process of content categorization and citations preprocessing/coding. Literature published in all top ranked and well regarded accounting journals that could be located in the *ISI Web of*



*Knowledge*, *EbscoHost*, *Science Direct*, *Scopus*, and *Wiley* databases are extensively searched and included in the dissertation, however, there may exist articles relevant to continuous auditing and/or behavioral accounting research published in a younger aged journal that are potentially omitted from this research due to this limitation of time and effort.

There are many directions of future research that can be explored and extended from this dissertation. Besides advancing and automating bibliometrics analysis steps to enable more efficient and timely research process, future studies can compare and reveal the similarities/variances of citations structures across different business fields over time, e.g., what are the main clusters' structure developed in the top tier journal in finance discipline and how is it similar to or different from those identified in *The Accounting Review* over time? How has citation structure been communicated and interlinked between business fields or within accounting subfields?

Other streams of future research could extend the usefulness of bibliometrics techniques in measuring the impact of accounting academic research on practice, or on the other hand, the extent of the influence of accounting practice has on the advancement of academic research? Moreover, what could be the evaluation tools that established the communication structure and network between accounting academia and practitioners? In addition, it would also be interesting to refine bibliometrics towards defining and considering what qualifies as “groundbreaking research” in accounting discipline by possibly identifying proper evaluation measures for which.

**TABLE 34**  
**Comparison of the Key Contribution in All Three Essays**

Accounting Bibliometrics: The Development and Intellectual Structure of Accounting Research			
Research Summary	Essay1 (Chapter 2)	Essay2 (Chapter 3)	Essay3 (Chapter 4)
Topic	A Bibliometric Analysis of the Intellectual Structure and Characteristics of Research Published in <i>The Accounting Review</i>	The Development and Intellectual Structure of Continuous Auditing Research	The Advancement of Behavioral Accounting Research - A Taxonomic Analysis on Research Characteristics
Period	1994-2008	1983-2011	1950- mid 2013
Method (Bibliometrics)	Content, Citation & Co-citation Analyses Graphical Data Mining	Content, Citation & Co-citation Analyses Graphical Data Mining	Content Analysis Comparative Analysis
Database Source	EbscoHost, ARD & ISI Web of Knowledge	EbscoHost, Elsevier, Wiley, Scopus, ARD & ISI Web of Knowledge	EbscoHost
Main Findings	<u>Accounting Area</u> Financial Accounting (dominant) <u>Research Method</u> Archival - Primary, Quantitative Regression & Statistical Modeling <u>Foundation Theory</u> Accounting, Economics & Finance	<u>Topical Area</u> General CA, CCM, & Enabling Tech.; Systems/Models Develop., Demand & Growth Environ., & Tech. Methods Intro & Application <u>Research Method</u> Analytical, Survey & Case	<u>Topical Focus</u> BAR Framework, BAR Curriculum, BAR Experiment Design, Decision Making & Judgment, Historical Development/Critique, Performance, Students' Behavior & Taxpayers' Behavioral Response
	<u>Core Citation Cluster</u> Accounting Choices, Performance & Compensation (94'-98') Earnings - Forecasts, Market Response & EM (99'-03') Accruals Anomaly, Earnings Management & Cost of Capital(04'-08')	<u>Ten Classic CA Studies</u> Groomer & Murthy (89'); Vasarhelyi & Halper (91'); Kogan et al. (99'); Alles et al. (02'); Rezaee et al.(02'); Vasarhelyi (02'); Searcy & Woodroof (03'); Vasarhelyi & Greenstein (03'); Alles et al. (04'); Vasarhelyi et al. (04')	<u>Research Method</u> Analytical Internal Logic, Experiment & Secondary Review  <u>Accounting Area</u> Managerial, Auditing, General Behavioral Research & Taxation

With collaborations of data mining and textual mining tools, accounting bibliometrics could potentially facilitate researchers to examine the proposed research questions as follows:

- Proposed Future Research Question 1: How could researchers utilize information retrieval, textual analysis tools, readability measures and bibliometrics altogether to measure the degree of comprehension and readability of academic research and facilitate effective knowledge dissemination to non-academics audience (e.g., practitioners) and/or young scholars (e.g., graduate and doctoral students)?
- Proposed Future Research Question 2: How could bibliometrics be used to properly imply the trend of knowledge dissemination between accounting and other business fields or between accounting and other disciplines over time? Is accounting field becoming more interdisciplinary or tribalized? Could the determinants of the trend be identified?
- Proposed Future Research Question 3: With the advancement and pervasiveness of online electronic databases, how can researchers utilize and categorize accounting knowledge more effectively and efficiently with bibliometrics usage?
- Proposed Future Research Question 4: Could taxonomizing research content, processing citations retrieval and citations statistical count all be completed efficiently with the support of semantic parsing and automated classification tools? How could the quality of the process as well as results be ensured?

- Proposed Future Research Question 5: In what way could bibliometrics contribute to evaluating breakthroughs and innovations in accounting?
- Proposed Future Research Question 6: How could bibliometrics analysis results at the authorship level provide additional information and support to accounting academics on research works evaluation for tenure or academic promotion purposes?
- Proposed Future Research Question 7: To refine accounting scholarly communication measurements, could citations and co-citations tools be extended to tri-citations and quadruple citations? How would these potential measures reinforce the degree of closeness evaluated between accounting knowledge communication networks?
- Proposed Future Research Question 8: How could researchers better measure the collaboration or existing gap between accounting academic research and professional practice by using bibliometrics and textual mining techniques?
- Proposed Future Research Question 9: Is there differences of research citation patterns between younger scholars (pre-tenured) and senior scholars (tenured) scholars that can be revealed by bibliometrics? And could potential variances imply an imbalanced weighted importance for different research areas?
- Proposed Future Research Question 10: How could academics generate better predictions of future accounting research trend using taxonomic and citations methods?

In summary, the heart of this dissertation lies in understanding and examining the research characteristics and intellectual structure of academic publications in three

accounting topical areas — *The Accounting Review* (TAR), the continuous auditing field, and the behavioral accounting field. Multiple bibliometric techniques including taxonomic classification, content analysis, citation analysis and co-citation analysis were applied to address accounting research questions of interest in the three essays. The fruitful findings of research characteristics and citations' structures in this dissertation provide concrete accounting historical value and implications. Moreover, it advances and extends the applicability of bibliometric techniques, which originated from the information science field, now wider applied and extended to the accounting discipline.

The main contribution of this dissertation lies in the accounting historical area, accounting bibliometrics methodological application and accounting education. The manuscript unfolds the chronological development and historical trend of academic literature over time, creates new taxonomies for continuous auditing and behavioral accounting fields, and benefits course materials in accounting higher education by the findings in citations intellectual structures, which can provide assistance and support to researchers and graduate students of interest to better understand the top cited or classic bibliographies over time. As online academic and accounting information databases becomes more available, accounting knowledge is much more accessible nowadays compared to any earlier decade. From a broader perspective, accounting bibliometrics have the potential to assist researchers in grasping a wider scope of information, managing the key attributes of which, and identifying the patterns of knowledge movements and diffusions. The advantage of applying accounting bibliometrics would

be complemented with collaboration from information retrieval, semantic parsing, automatic data classification and preprocess areas.

This dissertation addresses research questions with applications of accounting bibliometrics, which enable researchers to examine literature systematically through reviewing academic literature content to reveal knowledge characteristics, analyzing citations and co-citations statistically to shed light on knowledge collaboration, and presenting citations structure to graphically visualize knowledge communication networks. The summary of findings in this dissertation helps achieve the broad of understanding of knowledge evolution over time in three topical areas; results also serve as useful and applicable ground for future studies to compare against the development and contributions of accounting research hereafter.

## REFERENCES

- Allen, J. M., and A. C. Inkpen. 1991. An Analysis of Significant Contributions to the International Business Literature. *Journal of International Business Studies* 22 (1): 143-153
- Alles, M. A., G. Brennan, A. Kogan, and M. A. Vasarhelyi. 2006. Continuous Monitoring of Business Process Controls: A Pilot Implementation of a Continuous Auditing System at Siemens. *International Journal of Accounting Information Systems*. 7 (2): 137-161.
- Alles, M. A., A. Kogan, and M. A. Vasarhelyi. 2002. Feasibility and Economics of Continuous Assurance. *Auditing: A Journal of Practice and Theory*. 21 (1): 125-138.
- Alles, M., A. Kogan, M. Vasarhelyi, and J. Warren. 2007. Continuous Auditing. BNA Tax and Accounting Portfolio 5405 (Accounting Policy and Practice Series). Washington, D.C.
- Alles, M., A. Kogan, and M. A. Vasarhelyi. 2004. Restoring Auditor Credibility: Tertiary Monitoring and Logging of Continuous Assurance Systems. *International Journal of Accounting Information Systems*. 5 (2): 183-202.
- Alles, M., A. Kogan, and M. A. Vasarhelyi. 2008. Exploiting Comparative Advantage: A Paradigm for Value Added Research in Accounting Information Systems. *International Journal of Accounting Information Systems*. 9 (4): 202-215.
- Amer, T., A. D. Bailey Jr., and P. De. 1987. A Review of the Computer Information Systems Research Related to Accounting and Auditing. *Journal of Information Systems*. 2 (1): 3-28.
- American Institute of Certified Public Accountants. 1998. CPA Vision: 2011 and Beyond. AICPA, New York.
- American Institute of Certified Public Accountants. 1998. Statement on Auditing Standards No. 55. Consideration of the Internal Control Structure in a Financial Statement Audit. New York, NY : AICPA.
- Ashton, A. H. and R. H. Ashton. 1995. Judgment and Decision Making Research in Accounting and Auditing. New York. NY: Cambridge University Press.
- Badua, F. A. 2005. Pondering Paradigms: Tracing the Development of Accounting Thought with Taxonomic and Citation Analysis. *Dissertation, Rutgers University*.
- Badua, F., G. J. Previts, and M. Vasarhelyi. 2011. Tracing the Development of Accounting Thought by Analyzing Content, Communication, and Quality in Accounting Research Over Time. *Accounting Historians Journal* 38 (1): 31-56.

- Baldwin, A. A., C. E. Brown, and B. S. Trinkle. 2006. XBRL: An Impacts Framework and Research Challenge. *Journal of Emerging Technologies in Accounting*. 3 (1): 97-116.
- Bamber, E. M. 1993. Opportunities in Behavioral Accounting Research. *Behavioral Research in Accounting*. 5: 1-29.
- Becker, S. W. 1967. Discussion of the Effect of Frequency of Feedback on Attitudes and Performances. *Journal of Accounting Research* 5 (3): 225-228.
- Birnberg, J. G, and J. F. Shields. 1989. Three Decades of Behavioral Accounting Research: A Search for Order. *Behavioral Research in Accounting* 1: 23-74.
- Birnberg, J. G. 2000. The Role of Behavioral Research in Management Accounting Education in the 21st Century. *Issues in Accounting Education*. 15 (4): 714-728.
- Birnberg, J. G. 2011. A Proposed Framework for Behavioral Accounting Research. *Behavioral Research in Accounting*. 23 (1): 1-43.
- Bonner, S. E., J. W. Hesford, W. A. Van der Stede, and S. M. Young. 2006. The Most Influential Journals in Academic Accounting. *Accounting, Organizations, and Society* 31 (7): 663-685.
- Bonson, E., V. Cortijo, and T. Escobar. 2008. The Role of XBRL in Enhanced Business Reporting (EBR). *Journal of Emerging Technologies in Accounting*. 5 (1): 161-173.
- Bricker, R. J. 1988. Knowledge Preservation in Accounting: A Citational Study. *Abacus* 24 (2): 120-131.
- Bricker, R. J. 1989. An Empirical Investigation of the Structure of Accounting Research. *Journal of Accounting Research* 27 (2): 246-262.
- Bricker, R. J., and G. Previts. 1990. The Sociology of Accountancy: A Study of Academic and Practice Community Schisms. *Accounting Horizons*. 4 (1): 1-14.
- Brown, L. D., and J. C. Gardner. 1985a. Using Citation Analysis to Assess the Impact of Journals and Articles on Contemporary Accounting Research (CAR). *Journal of Accounting Research* 23 (1): 84-109.
- Brown, L. D., and J. C. Gardner. 1985b. Applying Citation Analysis to Evaluate the Research Contributions of Accounting Faculty and Doctoral Programs. *The Accounting Review* 60 (2): 262-277.
- Brown, L. D., and M. A. Vasarhelyi. 1985. Accounting Research Directory: The Database of Accounting Literature. New York: Marcus Wiener Publishing.



- Brown, L. D., J. C. Gardner, and M. A. Vasarhelyi. 1987. An Analysis of the Research Contributions of *Accounting, Organizations and Society*, 1976-1984. *Accounting, Organizations and Society* 12 (2): 193-204.
- Brown, L. D., J. C. Gardner, and M. A. Vasarhelyi. 1989. Attributes of Articles Impacting Contemporary Accounting Literature. *Contemporary Accounting Research* 5 (2): 793-815.
- Brown, L. D., and I. Laksmana. 2004. Ranking Accounting Ph.D. Programs and Faculties Using Social Science Research Network Downloads. *Review of Quantitative Finance and Accounting* 22 (3): 249-266.
- Brown, C. E., J. A. Wong, and A. A. Baldwin. 2007. A Review and Analysis of the Existing Research Streams in Continuous Auditing. *Journal of Emerging Technologies in Accounting*. 4 (1): 1-28.
- Burgstahler, D., and G. L. Sundem. 1989. The Evolution of Behavioral Accounting Research in the United States, 1968-1987. *Behavioral Research in Accounting* 1 (1): 75-108
- Byrnes, P. E., B. Ames, M. A. Vasarhelyi, A. Pawlicki, and D. McQuilken. 2012. The Current State of Continuous Auditing and Continuous Monitoring, AICPA, Assurance Services Executive Committee.
- Caplan, E. H. 1989. Behavioral Accounting - A Personal View. *Behavioral Research in Accounting*. 1 (1): 109-123.
- Cash Jr, J. I., A. D. Bailey Jr., and A. B. Whinston. 1977. A Survey of Techniques for Auditing EDP-Based Accounting Information Systems. *Accounting Review*. 52 (4): 813-832.
- Cawkell, A. E. 1976. Understanding Science by Analyzing Its Literature. *Essays of an Information Scientist* 2: 543-549.
- Chan, K. C., K. C. Chan, G. S. Seow, and K. Tam. 2009. Ranking Accounting Journals Using Dissertation Citation Analysis: A Research Note. *Accounting, Organizations and Society* 34 (6): 875-885.
- Chatfield, M. 1975. The Accounting Review's First Fifty Years. *The Accounting Review* 1 (1): 1-6.
- Chiu, V., and M. A. Vasarhelyi. 2012. The Intellectual Structure and Contribution of Research Published in *The Accounting Review (TAR)*- A Bibliometric Analysis. Working Paper. Rutgers University.
- CICA/AICPA. 1999. Continuous Auditing. Research Report, Toronto, Canada: The Canadian Institute of Chartered Accountants.

- Coe, R. K., and I. Weinstock. 1983. Evaluating Journal Publications of Marketing Professors: A Second Look. *Journal of Marketing Education* 5 (1): 37-42.
- Comunale, C. L., and T. R. Sexton. 2005. A Fuzzy Logic Approach to Assessing Materiality. *Journal of Emerging Technologies in Accounting*. 2 (1): 1-15.
- Cook, D. M. 1967. The Effect of Frequency of Feedback on Attitudes and Performance. *Journal of Accounting Research*. 5 (3): 213-224.
- Culnan, M. J. 1986. The Intellectual Development of Management Information Systems, 1972-1982: A Co-Citation Analysis. *Management Science* 32 (2): 156-172.
- De Aquino, C. E. M., W. L. Da Silva, and M. A. Vasarhelyi. 2008. Moving Toward Continuous Auditing. *Internal Auditor*. 65 (4): 27-29.
- Devine, C. T. 1960. Research Methodology and Accounting Theory Formation. *The Accounting Review*. 35 (3): 394-397.
- Devine, C. T. 1963. The Role of Conservatism Reexamined. *Journal of Accounting Research* 1 (2): 127-138.
- Dull, R. B., and D. P. Tegarden. 2004. Using Control Charts to Monitor Financial Reporting of Public Companies. *International Journal of Accounting Information Systems*. 5 (2): 109-127.
- Dull, R. B., D. P. Tegarden, and L. L. F. Schleifer. 2006. ACTIVE: A Proposal for an Automated Continuous Transaction Verification Environment. *Journal of Emerging Technologies in Accounting*. 3 (1): 81-96.
- Dyckman, T. R. 1964. The Effects of Alternative Accounting Techniques on Certain Management Decisions. *Journal of Accounting Research* 2 (1): 91-107.
- Dyckman, T. R., and S. A. Zeff. 1984. Two Decades of the *Journal of Accounting Research*. *Journal of Accounting Research* 22 (1): 225-297.
- Efendi, J., E. V. Mulig, and L. M. Smith. 2006. Information Technology and Systems Research Published in Major Accounting Academic and Professional Journals. *Journal of Emerging Technologies in Accounting*. 3 (1): 117-128.
- Elliott, R. K. 2002. Twenty-First Century Assurance. *Auditing: A Journal of Practice and Theory*. 21 (1): 129-146.
- Evans III, J. H. 2012. Annual Report and Editorial Commentary for *The Accounting Review*. *The Accounting Review* 87 (6): 2187-2221.
- Fleming, R. J., S. P. Graci, and J. E. Thompson. 2000. The Dawning of the Age of Quantitative/Empirical Methods in Accounting Research: Evidence from the

- Leading Authors of *The Accounting Review*, 1966-1985. *Accounting Historians Journal* 27 (1): 43-72.
- Flesher, D. 1991. The Third-Quarter Century of the American Accounting Association 1966-1991. *Sarasota: American Accounting Association*.
- Flowerday, S., A. W. Blundell, and R. Von Solms. 2006. Continuous Auditing Technologies and Models: A Discussion. *Computers & Security*. 25 (5): 325-331.
- Gal, G. 2008. Query Issues in Continuous Reporting Systems. *Journal of Emerging Technologies in Accounting*. 5 (1): 81-97.
- Garfield, E., I. H. Sher, and R. J. Torpie. 1964. The Use of Citation Data in Writing the History of Science. Philadelphia: Institute for Scientific Information.
- Garfield, E. 1972. Citation Analysis as a Tool in Journal Evaluation. *Science* 178 (4060): 471-479
- Garfield, E. 1979. Citation Indexing – Its Theory and Application in Science, Technology, and Humanities. New York: John Wiley and Sons.
- Garfield, E. 1983. Is Citation a Legitimate Evaluation Tool? *Scientometrics* 1 (4): 359-375.
- Garsombke, H. P., and R. H. Tabor. 1986. Factors Explaining the Use of EDP Audit Techniques. *Journal of Information Systems*. 1 (1): 48-66.
- Gmür, M. 2003. Co-Citation Analysis and the Search for Invisible Colleges: A Methodological Evaluation. *Scientometrics* 57 (1): 27-57.
- Groomer, S. M. 2006. Continuous Monitoring of Business Process Controls: A Pilot Implementation of a Continuous Auditing System at Siemens by Alles, Brennan, Kogan and Vasarhelyi Discussant's Comments. *International Journal of Accounting Information Systems*. 7 (2): 162-166.
- Groomer, S. M., and U. S. Murthy. 1989. Continuous Auditing of Database Applications: An Embedded Audit Module Approach. *Journal of Information Systems*. 3 (2): 53-69.
- Hansen, J. V., and N. C. Hill. 1989. Control and Audit of Electronic Data Interchange. *MIS Quarterly*. 13 (4): 403-413.
- Heck, J. L., and W. G. Bremser. 1986. Six Decades of The Accounting Review: A Summary of Author and Institutional Contributors. *The Accounting Review* 61 (4): 735-744.

- Heck, J. L., and R. E. Jensen. 2007. An Analysis of the Evolution of Research Contributions by *The Accounting Review*, 1926-2005. *Accounting Historians Journal* 34 (2): 109-141.
- Helms, G. L., J. M. Mancino, P. D. Warner and L. M. Smith. 1999. Information Technology Issues for the Attest, Audit, and Assurance Services Functions. *CPA Journal*. 69 (5): 62.
- Hoffman, D. L., and M. B. Holbrook. 1993. The Intellectual Structure of Consumer Research: A Bibliometric Study of Author Cocitations in the First 15 Years of the Journal of Consumer Research. *The Journal of Consumer Research* 19 (4): 505-517.
- Hofstедt, T. R. 1976. Behavioral Accounting Research: Pathologies, Paradigms and Prescriptions. *Accounting, Organizations and Society* 1 (1): 43-58.
- Hofstедt, T. R., and J. C. Kinard. 1970. A Strategy for Behavioral Accounting Research. *The Accounting Review* 45 (1): 38-54.
- Hopwood, A. 1989. Behavioral Accounting in Retrospect and Prospect. *Behavioral Research In Accounting* 1 (1): 1-22.
- Hopwood, A. G. 2007. Whither Accounting Research. *The Accounting Review* 82 (5): 1365-1374.
- Howard, T. P., and L. A. Nicolai. 1983. Attitude Measurement and Perceptions of Accounting Faculty Publication Outlets. *The Accounting Review* 58 (4): 765-776.
- Hunton, J. E., A. M. Wright and S. Wright. 2004. Continuous Reporting and Continuous Assurance: Opportunities for Behavioral Accounting Research. *Journal of Emerging Technologies in Accounting*. 1 (1): 91-102.
- Hunton, J. E., A. M. Wright, and S. Wright. 2007. The Potential Impact of More Frequent Financial Reporting and Assurance: User, Preparer, and Auditor Assessments. *Journal of Emerging Technologies in Accounting*. 4 (1): 47-67.
- Institute of Internal Auditors (IIA). 2000. Internal Auditing: Adding Value Across the Board. Corporate Brochure, IIA.
- Just, A. 2010. A Bibliometric Analysis of Research Published in the Major Accounting Journals from 1990-2007. *Dissertation- Otto Beisheim School of Management*
- Just, A., M. Meyer, U. Schaffer, M. A. Vasarhelyi, and V. Chiu. 2011. Promoting Diversity in Accounting Research: An Empirical Study of the Development of the Identity and Intellectual Structure of AOS from 1990 to 2007. Working Paper. Rutgers University.

- Kachelmeier, S. J. 2009. Annual Report and Editorial Commentary for *The Accounting Review*. *The Accounting Review* 84 (6): 2047-2075.
- Kachelmeier, S. J. 2010. Annual Report and Editorial Commentary for *The Accounting Review*. *The Accounting Review* 85 (6): 2173-2203.
- Kachelmeier, S. J. 2011. Annual Report and Editorial Commentary for *The Accounting Review*. *The Accounting Review* 86 (6): 2197-2233.
- Kaplan, R. S. 2011. Accounting Scholarship that Advances Professional Knowledge and Practice. *The Accounting Review* 86 (2): 367-383.
- Kogan, A., E. F. Sudit, and M. A. Vasarhelyi. 1999. Continuous Online Auditing: A Program of Research. *Journal of Information Systems*. 13 (2): 87-103.
- Koonce, L. 1992. Explanation and Counter-Explanation During Analytical Review. *The Accounting Review* 67 (1): 59-76.
- Koskivaara, E., and B. Back. 2007. Artificial Neural Network Assistant (ANNA) for Continuous Auditing and Monitoring of Financial Data. *Journal of Emerging Technologies in Accounting*. 4 (1): 29-45.
- Kuhn, T. S. 1970. *The Structure of Scientific Revolutions*. Chicago: Chicago University Press.
- Kuhn, J. R., and S. G. Sutton. 2006. Learning from WorldCom: Implications for Fraud Detection through Continuous Assurance. *Journal of Emerging Technologies in Accounting*. 3 (1): 61-80.
- Lee, T. 1995. Shaping the US Academic Accounting Research Profession: The American Accounting Association and the Social Construction of a Professional Elite. *Critical Perspectives on Accounting* 6 (3): 241- 261.
- Lee, T. A., and P. F. Williams. 1999. Accounting From the Inside: Legitimizing The Accounting Academic Elite. *Critical Perspectives on Accounting*. 10 (6): 867-895.
- Lenard, M. J., A. L. Watkins, and P. Alam. 2007. Effective Use of Integrated Decision Making: An Advanced Technology Model for Evaluating Fraud in Service-Based Computer and Technology Firms. *Journal of Emerging Technologies in Accounting*. 4 (1): 123-137.
- Libby, R. 1995. The Role of Knowledge and Memory in Audit Judgment. In *Judgment and Decision Making Research in Accounting and Auditing*, edited by Ashton, A. H. and R. H. Ashton. New York, NY: Cambridge University Press.
- Libby, R., R. Bloomfield, and M. W. Nelson. 2002. Experimental Research in Financial Accounting. *Accounting, Organizations and Society*. 27 (8): 775-810.

- Libby, R., and B. L. Lewis. 1977. Human Information Processing Research in Accounting: The State of the Art. *Accounting, Organizations and Society* 2 (3): 245-268.
- Libby, R., and B. L. Lewis. 1982. Human Information Processing Research in Accounting: The State of the Art in 1982. *Accounting, Organizations and Society* 7 (3): 231-285.
- Libby, R. and J. Luft. 1993. Determinants of Judgment Performance in Accounting Settings: Ability, Knowledge, Motivation, and Environment. *Accounting, Organizations and Society*. 18 (5): 425-450.
- Lindquist, T. M., and G. Smith. 2009. Journal of Management Accounting Research: Content and Citation Analysis of the First 20 years. *Journal of Management Accounting Research* 21 (1): 249-292.
- Lord, A. T. 1989. The Development of Behavioral Thought in Accounting, 1952-1981. *Behavioral Research in Accounting* 1 (1): 124-149.
- Lowe, A., and J. Locke. 2005. Perceptions of Journal Quality and Research Paradigm: Result of a web-based survey of British Accounting Academics. *Accounting, Organizations and Society*. 30 (1): 81-98.
- Luckett, P., and I. Eggleton. 1991. Feedback and Management Accounting: A Review of Research into Behavioral Consequences. *Accounting, Organizations, and Society*.
- McCain, K. W. 1986. Cocited Author Mapping as a Valid Representation of Intellectual Structure. *Journal of the American Society for Information Science* 37 (3): 111-122.
- McCain, K. W. 1990. Mapping Authors in Intellectual Space: A Technical Overview. *Journal of the American Society for Information Science* 41 (6): 433-443.
- McCarthy, W. E. 2012. Accounting Craftspeople versus Accounting Seers: Exploring the Relevance and Innovation Gaps in Academic Accounting Research. *Accounting Horizons* 26 (4): 833-843.
- McRae, T. W. 1974. A Citation Analysis of the Accounting Information Network. *Journal of Accounting Research* 12 (1): 80-92.
- Messier, W. F. Jr. 1995. Research in and Development of Audit Decision Aids: A Review. In *Judgment and Decision Making Research in Accounting and Auditing*, edited by Ashton, A. H. and R. H. Ashton. New York, NY: Cambridge University Press.

- Messier, W. F. Jr., C. A. Simon, and J. L. Smith. 2013. Two Decades of Behavioral Research On Analytical Procedures: What Have We Learned? *Auditing: A Journal of Practice & Theory*. 32 (1): 139-181.
- Meyer, M., and J. T. Rigsby. 2001. A Descriptive Analysis of the Content and Contributors of Behavioral Research In Accounting 1989-1998. *Behavioral Research In Accounting* 13 (1): 253-278.
- Milne, M., J. Guthrie, and L. Parker. 2008. Into the Light and Engagement: Two Decades of Interdisciplinary Perspectives on Accounting, Auditing and Accountability Research. *Accounting, Auditing, and Accountability Journal* 21 (2): 117-128.
- Morris, B. W., and A. B. Pushkin. 1995. Determinants of information systems audit involvement in EDI systems development. *Journal of Information Systems*. 9 (2): 111-128.
- Moser, D. V. 1998. Using An Experimental Economics Approach in Behavioral Accounting Research. *Behavioral Research In Accounting*. 10: 94-109.
- Murthy, U. S., and S. M. Groomer. 2004. A Continuous Auditing Web Services Model for XML-Based Accounting Systems. *International Journal of Accounting Information Systems*. 5 (2): 139-163.
- Nigrini, M. J., and A. J. Johnson. 2008. Using Key Performance Indicators and Risk Measures in Continuous Monitoring. *Journal of Emerging Technologies in Accounting*. 5 (1): 65-80.
- Nobata, C., Collier, N., and J. Tsu. 1999. Automatic Term Identification and Classification in Biology Texts. In *Proceedings of the Natural Language Pacific Rim Symposium*.
- Osareh, F. 1996a. Bibliometrics, Citation Analysis and Co-Citation Analysis: A Review of Literature I. *Libri* 46 (3): 149-158.
- Osareh, F. 1996b. Bibliometrics, Citation Analysis and Co-Citation Analysis: A Review of Literature II. *Libri* 46 (3): 217-225.
- Price, D. J. de S. 1986. Little science, big science- and beyond. New York, Columbia University Press.
- PricewaterhouseCoopers. (PWC) 2006. *State of the Internal Audit Profession Study: Continuous Auditing Gains Momentum*. New York, NY: PWC.
- PricewaterhouseCoopers. (PWC) 2007. *Internal Audit 2012*. New York, NY: PWC.
- Reiter, S. A. 1998. Economic Imperialism In Accounting. *Critical Perspectives on Accounting*. 9 (2): 143-171.

- Reiter, S. A., and P. F. Williams. 2002. The Structure and Progressivity of Accounting Research: The Crisis in the Academy Revisited. *Accounting, Organizations and Society* 27 (6): 575-607.
- Rezaee, Z., A. Sharbatoghlie, R. Elam, and P. L. McMickle. 2002. Continuous Auditing: Building Automated Auditing Capability. *Auditing: A Journal of Practice and Theory*. 21 (1): 147-163.
- Robert, L. B., and E. D. Harold. 2003. Computer-Assisted Audit Tools and Techniques: Analysis and Perspectives. *Managerial Auditing Journal*. 18 (9): 725-731.
- Rodgers, J. L., and P. F. Williams. 1996. Patterns of Research Productivity and Knowledge Creation at The Accounting Review: 1967-1993. *The Accounting Historians Journal* 23 (1): 51-88.
- Santos, C., P. Sousa, C. Ferreira, and J. Tribolet. 2008. Conceptual Model for Continuous Organizational Auditing with Real Time Analysis and Modern Control Theory. *Journal of Emerging Technologies in Accounting*. 5 (1): 37-63.
- Small, H. 1973. Co-citation in the Scientific Literature: A New Measure of the Relationship Between Two Documents. *Journal of the American Society for Information Science* 24 (4): 265-269.
- Smith, L. M. 1994. Relative Contributions of Professional Journals to the Field of Accounting. *Accounting Educators' Journal* 5 (1): 1-31.
- Snowball, D. 1986. Accounting Laboratory Experiments On Human Judgment: Some Characteristics and Influences. *Accounting, Organizations and Society* 11 (1): 47-69.
- Solomon, I., and M. D. Shields. 1995. Judgment and Decision Research in Auditing. In *Judgment and Decision Making Research in Accounting and Auditing*, edited by Ashton, A. H., and R. H. Ashton. New York, NY: Cambridge University Press.
- Solomon, I., and K. T. Trotman. 2003. Experimental Judgment An Decision Research In Auditing: The First 25 Years of AOS. *Accounting, Organizations and Society*. 28 (4): 395-412.
- Swieringa, R. J., and K. E. Weick. 1982. An Assessment of Laboratory Experiments in Accounting. *Journal of Accounting Research*. 20: 56-101.
- Stemler, S. 2001. An Overview of Content Analysis. Available at: <http://pareonline.net/getvn.asp?v=7&n=17>
- Trotman, K. T. 2011. A Different Personal Perspective Through The Behavioral Accounting Literature. *Behavioral Accounting Research In Accounting*. 23 (1): 203-208.



- Tymon, W. G. Jr., D. E. Stout, and K. N. Shaw. 1998. Critical Analysis and Recommendations Regarding The Role of Perceived Environmental Uncertainty In Behavioral Accounting Research. *Behavioral Research In Accounting*. 10: 23-46.
- Vasarhelyi, M. 1983. A Framework for Audit Automation: Online Technology and the Audit Process. *The Accounting Forum*. Jan.
- Vasarhelyi, M. A. 1984. Automation and Changes in the Audit Process (Practice Note). *Auditing: A Journal of Practice and Theory*. 4 (1): 100-106.
- Vasarhelyi, M. A. 2002. Concepts in Continuous Assurance. In *Researching Accounting as an Information Systems Discipline*, edited by S. Sutton, and V. Arnold. Sarasota, FL: American Accounting Association.
- Vasarhelyi, M. A., M. G. Alles, and K. T. Williams. 2010. Continuous Assurance for the Now Economy. A Thought Leadership Paper for the Institute of Chartered Accountants in Australia. July.
- Vasarhelyi, M. A., D. H. Bao, and J. Berk. 1988. Trends in the Evolution of Scholarly Accounting Thought: A Quantitative Examination,. *The Accounting Historians Journal*. 15 (1): 45-64.
- Vasarhelyi, M. A., and J. Berk. 1984. Multiple Taxonomies of Accounting Research. Working Paper, Columbia University.
- Vasarhelyi, M., and M. Greenstein. 2003. Underlying Principles of the Electronization of Business: A Research Agenda. *International Journal of Accounting Information Systems*, 4 (1): 1-25.
- Vasarhelyi, M. A., and F. B. Halper. 1991. The Continuous Audit of Online Systems. *Auditing: A Journal of Practice and Theory*. 10 (1): 110-125.
- Vasarhelyi, M. A., A. Kogan, and M. Alles. 2002. Would Continuous Auditing Have Prevented Auditing Have Prevented The Enron Mess? *CPA Journal*, p. 80.
- Vasarhelyi, M. A, C. E. M. De Aquino, and W. L. Da Silva. 2008. On the Road to Continuous Auditing. *Internal Auditor*. 27-29.
- Voarino, P., and M. A. Vasarhelyi. 2001. Continuous Performance and Control Monitoring at BIPOP. Working Paper. Rutgers University.
- Waymire, G. B. 2012. Seeds of Innovation in Accounting Scholarship. *Issues In Accounting Education* 27 (4): 1077-1093.
- Weber, R. P., and W. C. Stevenson. 1981. Evaluations of Accounting Journal and Department Quality. *The Accounting Review* 56 (3): 596-612.

- Weber, R. P. 1990. Basic Content Analysis. 2nd Edition, Newbury Park, CA: Sage.
- Wells, M. C. 1976. A Revolution in Accounting Thought. *The Accounting Review* 51 (3): 471-482.
- Williams, P. F. 1985. A Descriptive Analysis on the Authorship in *The Accounting Review*. *The Accounting Review* 60 (2): 300-313.
- Williams, P. F., and J. L. Rodgers. 1995. The Accounting Review and the Production of Accounting Knowledge. *Critical Perspectives on Accounting* 6 (3): 263-287.
- Williams, P. F., J. G. Jenkins, and L. Ingraham. 2006. The Winnowing Away of Behavioral Accounting Research in the US: The Process for Anointing Academic Elites. *Accounting, Organizations and Society*. 31 (8): 783-818.
- Woodroof, J., and D. Searcy. 2001. Continuous Audit: Model Development and Implementation Within a Debt Covenant Compliance Domain. *International Journal of Accounting Information Systems*. 2 (3): 169-191.

## APPENDICES

### APPENDIX I

#### Taxonomy Classes

<i>A. RESEARCH METHOD</i>	206.	Internal Controls	302.	Breakeven
1. Analytical Internal Logic	207.	Costs	303.	Budgeting & Planning
2. Analytical Simulation	208.	Budgets	304.	Relevant Costs
3. Archival - Primary	209.	Group Behavior	305.	Responsibility Accounting
4. Archival - Secondary	210.	Pricing	306.	Cost Allocations
5. Empirical - Case	211.	Compensation	307.	Capital Budgeting
6. Empirical - Field	300.	External Information	308.	Tax (Tax Planning)
7. Empirical - Lab	301.	Footnotes	309.	Overhead Allocations
9. Opinion Survey	302.	Sec Info, (10 K)	310.	HRA/Social Accounting
10. Mixed	303.	Forecasts	311.	Variances
	304.	Audit Opinion	312.	Executive Compensation
<i>B. INFERENCE STYLE</i>	305.	Bond Rating	400.	Other
1. Inductive	309.	Other	401.	Submissions To FASB Etc
2. Deductive	400.	Market Based Info	402.	Manager Decision Character.
3. Both	401.	Risk	403.	Information Structures (Disclosure)
	402.	Security Prices or Return	404.	Auditor Training
<i>C. MODE OF REASONING</i>	403.	Security Trading	405.	Insider Trading Rules
1. Quantitative: Descriptive Statistics	404.	Options	406.	Probability Elicitation
2. Quantitative: Regression	405.	All Of The Above - Market	407.	International Differences
3. Quantitative: Anova	500.	Mixed	408.	Form of Organization (Partnership)
4. Quantitative: Factor Analysis, MDS, Probit, Discriminant	<i>G. TREATMENT</i>		409.	Auditor Behavior
5. Quantitative: Markov	100.	Financial Accounting6 Methods	410.	Methodology
6. Quantitative: Non-Parametric	101.	Cash	411.	Business Failure
7. Quantitative: Correlation	102.	Inventory	412.	Education
8. Quantitative: Analytical	103.	Other Current Assets	413.	Professional Responsibilities
10. Mixed	104.	Property Plant & Equip/Depr.	414.	Forecasts
90. Qualitative	105.	Other Non-Current Assets	415.	Decision Aids
	106.	Leases	416.	Organization & Environment
<i>D. MODE OF ANALYSIS</i>	107.	Long Term Debt	417.	Litigation
1. Normative	108.	Taxes	418.	Governance
2. Descriptive	109.	Other Liabilities		
3. Mixed	121.	Valuation (Inflation)		
	122.	Special Items		
<i>E. SCHOOL OF THOUGHT</i>	131.	Revenue Recognition	<i>H. ACCOUNTING AREA</i>	
1. Behavioral - HIPS	132.	Accounting Changes	1.	Tax
2. Behavioral - Other	133.	Business Combinations	2.	Financial
3. Statistical Modeling - EMH	134.	Interim Reporting	3.	Managerial
4. Statistical Modeling - Time Series	135.	Amortization/Depletion	4.	Audit
5. Statistical Modeling - Information Economics	136.	Segment Reports	5.	Information Systems
6. Statistical Modeling - Mathematical Programming	137.	Foreign Currency	6.	Mixed
7. Statistical Modeling - Other	41.	Dividends - Cash		
8. Accounting Theory	143.	Pension (Funds)	<i>I. GEOGRAPHY</i>	
9. Accounting History	150.	Other -Financial Accounting	1.	Non-USA
10. Institutional	160.	Financial Statement	2.	USA
11. Other		Timing	3.	Both
12. Agency Theory	170.	R & D	<i>J. OBJECTIVE</i>	
13. Expert Systems	171.	Oil & Gas	1.	Profit
	200.	Auditing	2.	Not for Profit
<i>F. INFORMATION</i>	201.	Opinion	3.	Regulated
100. Financial Statements	202.	Sampling	4.	All
101. Net Income or EPS	203.	Liability	<i>K. APPLICABILITY</i>	
102. Income Statement	204.	Risk	1.	Immediate
103. Balance Sheet	205.	Independence	2.	Medium term
104. Cash Flows, Etc	206.	Analytical Review	3.	Long Term
105. Other Fin. Statement	207.	Internal Control		
106. Financial Ratios	208.	Timing	<i>L. FOUNDATION DISCIPLINE</i>	
107. Combination 1-2	209.	Materiality	1.	Psychology
108. Quarterly Reports	210.	EDP Auditing	2.	Sociology, Political Science, Philosophy
109. Foreign Currency	211.	Organization	3.	Economics & Finance
110. Pension'	212.	Internal Audit	4.	Engineering, Communications & Computer Sciences
112. Debt Covenants	213.	Errors	6.	Mathematics, Decision Sciences, Game Theory
200. Internal Information	214.	Trail	7.	Statistics
201. Performance Measure	215.	Judgment	8.	Law
202. Personality Measures	216.	Planning	9.	Other Mixed
203. Auditor Behavior	217.	Efficiency - Operational	10.	Accounting
204. Manager Behavior	218.	Audit Theory	11.	Management
205. Decision Making	219.	Confirmations		
	300.	Managerial		
	301.	Transfer Pricing		

## APPENDIX II

### Co-Citation Count Matrix

Total Counts	11	10	14	13	10	19	16	12	26	10	12	12	11	10	20	25	11	11	13	19
	ABARBANELL JS-1997-J ACCOUNT RES-V35-P1	BALL R-1989-J ACCOUNT RES-V6-P159	BALL R-2000-J ACCOUNT ECON-V29-P1	BANKER RD-1989-J ACCOUNT RES-V27-P21	BARTH ME-1998-J ACCOUNT ECON-V25-P1	BARTOV E-2002-J ACCOUNT ECON-V33-P173	BASU S-1997-J ACCOUNT ECON-V24-P3	BECKER C-1998-CONTEMP ACCOUNT RES-V15-P1	BELSLEY DA-1980-REGRESSION DIAGNOSTI-BK	BENESH MD-1999-ACCOUNT REV-V74-P425	BERNARD VL-1990-J ACCOUNT ECON-V13-P305	BOTOSAN CA-1997-ACCOUNT REV-V72-P323	BOTOSAN CA-2002-J ACCOUNT RES-V40-P21	BRADSHAW MT-2001-J ACCOUNT RES-V39-P45	BROWN LD-2001-J ACCOUNT RES-V39-P221	BURGSTAHLER D-1997-J ACCOUNT ECON-V24-P39	BUSHEE BJ-1998-ACCOUNT REV-V73-P305	CLAUS J-2001-J FINANC-V56-P1629	COLLINS DV-1997-J ACCOUNT ECON-V24-P39	DECHOV P-1996-CONTEMP ACCOUNT RES-V13-J
ABARBANELL JS-1997-J ACCOUNT RES-V35-P1	11	1	0	0	0	1	0	1	3	0	2	0	0	1	0	0	0	0	0	1
BALL R-1989-J ACCOUNT RES-V6-P159	1	10	0	0	0	2	1	0	0	1	3	1	1	1	1	1	0	0	0	1
BALL R-2000-J ACCOUNT ECON-V29-P1	0	0	14	0	0	1	7	1	1	2	1	3	3	1	1	5	0	2	2	
BANKER RD-1989-J ACCOUNT RES-V27-P21	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BARTH ME-1998-J ACCOUNT ECON-V25-P1	0	0	0	0	10	1	1	0	2	0	0	0	0	1	0	1	0	2	3	
BARTOV E-2002-J ACCOUNT ECON-V33-P173	1	2	1	0	1	19	2	2	1	2	1	1	1	1	6	7	3	0	3	
BASU S-1997-J ACCOUNT ECON-V24-P3	0	1	7	0	1	2	16	2	1	2	0	1	1	1	2	3	0	1	3	
BECKER C-1998-CONTEMP ACCOUNT RES-V15-P1	1	0	1	0	0	2	2	12	2	1	0	1	0	0	0	3	0	1	0	
BELSLEY DA-1980-REGRESSION DIAGNOSTI-BK	3	0	1	0	2	1	1	2	26	1	2	2	1	2	0	0	1	0	0	
BENESH MD-1999-ACCOUNT REV-V74-P425	0	1	2	0	0	2	2	1	1	10	0	0	0	0	0	1	0	0	0	
BERNARD VL-1990-J ACCOUNT ECON-V13-P305	2	3	1	0	0	1	0	0	2	0	12	0	0	2	1	3	1	0	2	
BOTOSAN CA-1997-ACCOUNT REV-V72-P323	0	1	3	0	0	1	1	1	2	0	0	12	8	0	0	0	0	6	1	
BOTOSAN CA-2002-J ACCOUNT RES-V40-P21	0	1	3	0	0	1	1	0	1	0	0	8	11	0	0	0	0	7	1	
BRADSHAW MT-2001-J ACCOUNT RES-V39-P45	1	1	1	0	1	1	1	0	2	0	2	0	0	10	1	2	1	0	0	
BROWN LD-2001-J ACCOUNT RES-V39-P221	0	1	1	0	0	6	2	0	0	0	1	0	0	1	20	2	0	0	1	
BURGSTAHLER D-1997-J ACCOUNT ECON-V24-P39	0	1	5	0	1	7	3	3	0	1	3	0	0	2	2	25	3	0	3	
BUSHEE BJ-1998-ACCOUNT REV-V73-P305	0	0	0	0	0	3	0	0	1	0	1	0	0	1	0	3	11	0	1	
CLAUS J-2001-J FINANC-V56-P1629	0	0	2	0	2	0	1	1	0	0	0	6	7	0	0	0	11	2		

### Co-Cite Score Matrix

Total Counts	11	10	14	13	10	19	16	12	26	10	12	12	11	10	20
	ABARBANELL JS-1997-J ACCOUNT RES-V35-P1	BALL R-1989-J ACCOUNT RES-V6-P159	BALL R-2000-J ACCOUNT ECON-V29-P1	BANKER RD-1989-J ACCOUNT RES-V27-P21	BARTH ME-1998-J ACCOUNT ECON-V25-P1	BARTOV E-2002-J ACCOUNT ECON-V33-P173	BASU S-1997-J ACCOUNT ECON-V24-P3	BECKER C-1998-CONTEMP ACCOUNT RES-V15-P1	BELSLEY DA-1980-REGRESSION DIAGNOSTI-BK	BENESH MD-1999-ACCOUNT REV-V74-P425	BERNARD VL-1990-J ACCOUNT ECON-V13-P305	BOTOSAN CA-1997-ACCOUNT REV-V72-P323	BOTOSAN CA-2002-J ACCOUNT RES-V40-P21	BRADSHAW MT-2001-J ACCOUNT RES-V39-P45	BROWN LD-2001-J ACCOUNT RES-V39-P221
79															
Total Counts	11	10	14	13	10	19	16	12	26	10	12	12	11	10	20
ABARBANELL JS-1997-J ACCOUNT RES-V35-P1	11	1.00	0.01	0.00	0.00	0.01	0.00	0.01	0.04	0.00	0.03	0.00	0.00	0.01	0.00
BALL R-1989-J ACCOUNT RES-V6-P159	10	0.01	1.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.08	0.01	0.01	0.01	0.01
BALL R-2000-J ACCOUNT ECON-V29-P1	14	0.00	0.00	1.00	0.00	0.00	0.23	0.01	0.00	0.03	0.01	0.06	0.07	0.01	0.00
BANKER RD-1989-J ACCOUNT RES-V27-P21	13	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTH ME-1998-J ACCOUNT ECON-V25-P1	10	0.00	0.00	0.00	0.00	1.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.01	0.00
BARTOV E-2002-J ACCOUNT ECON-V33-P173	19	0.01	0.03	0.00	0.00	0.01	1.00	0.01	0.02	0.00	0.03	0.01	0.01	0.01	0.10
BASU S-1997-J ACCOUNT ECON-V24-P3	16	0.00	0.01	0.23	0.00	0.01	0.01	1.00	0.02	0.00	0.03	0.00	0.01	0.01	0.01
BECKER C-1998-CONTEMP ACCOUNT RES-V15-P1	12	0.01	0.00	0.01	0.00	0.00	0.02	0.02	1.00	0.02	0.01	0.00	0.01	0.00	0.00
BELSLEY DA-1980-REGRESSION DIAGNOSTI-BK	26	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.02	1.00	0.01	0.02	0.02	0.00	0.02
BENESH MD-1999-ACCOUNT REV-V74-P425	10	0.00	0.01	0.03	0.00	0.00	0.03	0.03	0.01	0.01	1.00	0.00	0.00	0.00	0.00
BERNARD VL-1990-J ACCOUNT ECON-V13-P305	12	0.03	0.08	0.01	0.00	0.00	0.01	0.00	0.00	0.02	0.00	1.00	0.00	0.04	0.01
BOTOSAN CA-1997-ACCOUNT REV-V72-P323	12	0.00	0.01	0.06	0.00	0.00	0.01	0.01	0.01	0.02	0.00	0.00	1.00	0.51	0.00
BOTOSAN CA-2002-J ACCOUNT RES-V40-P21	11	0.00	0.01	0.07	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.51	1.00	0.00	0.00
BRADSHAW MT-2001-J ACCOUNT RES-V39-P45	10	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.02	0.00	0.04	0.00	1.00	0.01
BROWN LD-2001-J ACCOUNT RES-V39-P221	20	0.00	0.01	0.00	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.01	0.00	0.01	1.00
BURGSTAHLER D-1997-J ACCOUNT ECON-V24-P39	25	0.00	0.01	0.09	0.00	0.01	0.12	0.03	0.04	0.00	0.01	0.04	0.00	0.00	0.01
BUSHEE BJ-1998-ACCOUNT REV-V73-P305	11	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
CLAUS J-2001-J FINANC-V56-P1629	11	0.00	0.00	0.03	0.00	0.04	0.00	0.01	0.01	0.00	0.00	0.28	0.40	0.00	0.00
COLLINS DV-1997-J ACCOUNT ECON-V24-P39	13	0.01	0.01	0.02	0.00	0.08	0.04	0.05	0.00	0.00	0.03	0.01	0.01	0.00	0.00

### Classification Results Summary-Research Method

<b>A. Research Method</b>										
<i>Code</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>9</i>	<i>10</i>	
<b>Taxon Class Name/Year</b>	<b>Analytical Internal Logic</b>	<b>Analytical Simulation</b>	<b>Archival- Primary</b>	<b>Archival- Secondary</b>	<b>Empirical Case</b>	<b>Empirical Field</b>	<b>Empirical Lab</b>	<b>Opinion Survey</b>	<b>Mixed</b>	<b>Total Articles</b>
1994	6	0	14	9	0	1	3	0	1	34
1995	5	0	4	11	1	0	8	0	0	29
1996	4	0	9	8	1	0	6	0	0	28
1997	3	1	9	8	0	0	6	0	0	27
1998	4	0	5	12	0	1	2	0	0	24
<b>94'-98' Counts</b>	22	1	41	48	2	2	25	0	1	142
<b>94'-98' Percentage</b>	15.49%	0.70%	28.87%	33.80%	1.41%	1.41%	17.61%	0.00%	0.70%	100.00%
<b>94'-98' Ranking</b>	4	7	2	1	5	5	3	9	7	-
1999	6	0	4	7	0	2	3	0	0	22
2000	1	0	7	2	0	0	9	0	0	19
2001	6	0	10	5	1	0	6	1	0	29
2002	4	2	22	9	0	3	5	1	0	46
2003	5	0	32	0	1	2	1	1	0	42
<b>99'-03' Counts</b>	22	2	75	23	2	7	24	3	0	158
<b>99'-03' Percentage</b>	13.92%	1.27%	47.47%	14.56%	1.27%	4.43%	15.19%	1.90%	0.00%	100.00%
<b>99'-03' Ranking</b>	4	7	1	3	7	5	2	6	9	-
2004	6	1	27	0	0	1	9	2	0	46
2005	6	0	27	0	0	1	13	0	0	47
2006	4	0	27	0	0	0	9	1	2	43
2007	8	1	22	0	1	2	7	1	2	44
2008	5	0	37	0	0	2	8	0	0	52
<b>04'-08' Counts</b>	29	2	140	0	1	6	46	4	4	232
<b>04'-08' Percentage</b>	12.50%	0.86%	60.34%	0.00%	0.43%	2.59%	19.83%	1.72%	1.72%	100.00%
<b>04'-08' Ranking</b>	3	7	1	9	8	4	2	5	5	-
<b>Total Counts</b>	73	5	256	71	5	15	95	7	5	532
<b>Overall Percentage</b>	13.72%	0.94%	48.12%	13.35%	0.94%	2.82%	17.86%	1.32%	0.94%	100.00%
<b>Overall Ranking</b>	3	7	1	4	7	5	2	6	7	-

### Classification Results Summary-Mode of Reasoning

<b>B. Mode of Reasoning</b>											
<i>Code</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>10</i>	<i>90</i>	
Taxon Class Name/Year	Quantitative-Descriptive Statistics	Quantitative-Regression	Quantitative-Anova	Quantitative-Factor Analysis, MDS, Probit, Discriminant	Quantitative-Markov	Quantitative-Non-Parametric	Quantitative-Correlation	Quantitative-Analytical	Mixed	Qualitative	Total Articles
1994	4	17	3	2	0	1	1	6	0	0	34
1995	2	12	7	3	0	0	0	5	0	0	29
1996	0	17	3	0	0	1	1	4	2	0	28
1997	0	19	3	0	0	0	1	4	0	0	27
1998	0	2	1	0	0	0	0	5	16	0	24
<b>94'-98' Counts</b>	<b>6</b>	<b>67</b>	<b>17</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>24</b>	<b>18</b>	<b>0</b>	<b>142</b>
<b>94'-98' Percentage</b>	<b>4.23%</b>	<b>47.18%</b>	<b>11.97%</b>	<b>3.52%</b>	<b>0.00%</b>	<b>1.41%</b>	<b>2.11%</b>	<b>16.90%</b>	<b>12.68%</b>	<b>0.00%</b>	<b>100.00%</b>
<b>94'-98' Ranking</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>2</b>	<b>3</b>	<b>9</b>	<b>-</b>
1999	0	6	2	0	0	0	0	6	8	0	22
2000	1	8	4	0	0	2	0	1	3	0	19
2001	0	17	2	0	0	0	0	5	4	1	29
2002	1	32	4	0	0	2	0	3	3	1	46
2003	1	32	2	1	0	1	0	5	0	0	42
<b>99'-03' Counts</b>	<b>3</b>	<b>95</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>20</b>	<b>18</b>	<b>2</b>	<b>158</b>
<b>99'-03' Percentage</b>	<b>1.90%</b>	<b>60.13%</b>	<b>8.86%</b>	<b>0.63%</b>	<b>0.00%</b>	<b>3.16%</b>	<b>0.00%</b>	<b>12.66%</b>	<b>11.39%</b>	<b>1.27%</b>	<b>100.00%</b>
<b>99'-03' Ranking</b>	<b>6</b>	<b>1</b>	<b>4</b>	<b>8</b>	<b>9</b>	<b>5</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>-</b>
2004	1	23	3	4	0	0	2	6	3	4	46
2005	0	28	0	0	0	0	0	6	2	11	47
2006	0	28	7	3	0	0	0	3	2	0	43
2007	2	20	3	7	0	0	1	6	3	2	44
2008	1	25	5	6	0	0	0	3	9	3	52
<b>04'-08' Counts</b>	<b>4</b>	<b>124</b>	<b>18</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>24</b>	<b>19</b>	<b>20</b>	<b>232</b>
<b>04'-08' Percentage</b>	<b>1.72%</b>	<b>53.45%</b>	<b>7.76%</b>	<b>8.62%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.29%</b>	<b>10.34%</b>	<b>8.19%</b>	<b>8.62%</b>	<b>100.00%</b>
<b>04'-08' Ranking</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>-</b>
<b>Total Counts</b>	<b>13</b>	<b>286</b>	<b>49</b>	<b>26</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>68</b>	<b>55</b>	<b>22</b>	<b>532</b>
<b>Overall Percentage</b>	<b>2.44%</b>	<b>53.76%</b>	<b>9.21%</b>	<b>4.89%</b>	<b>0.00%</b>	<b>1.32%</b>	<b>1.13%</b>	<b>12.78%</b>	<b>10.34%</b>	<b>4.14%</b>	<b>100.00%</b>
<b>Overall Ranking</b>	<b>7</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>10</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>-</b>

## Classification Results Summary-School of Thought

<u>C. School of Thought</u>														
<i>Code</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	
Taxon Class Name/Year	Behavioral Hips	Behavioral Other	Statistical Modeling EMH	Statistical Modeling Times Series	Statistical Modeling Information Economics	Statistical Modeling Mathematical Programming	Statistical Modeling Other	Accounting Theory	Accounting History	Institutional	Other	Agency Theory	Expert Systems	Total Articles
1994	3	0	13	2	8	0	8	0	0	0	0	0	0	34
1995	9	0	8	2	8	0	2	0	0	0	0	0	0	29
1996	5	0	14	1	7	0	0	0	0	1	0	0	0	28
1997	6	0	11	0	5	0	4	0	0	1	0	0	0	27
1998	3	5	7	0	5	0	0	3	0	0	0	1	0	24
94'-98' Counts	26	5	53	5	33	0	14	3	0	2	0	1	0	142
94'-98' Percentage	18.31%	3.52%	37.32%	3.52%	23.24%	0.00%	9.86%	2.11%	0.00%	1.41%	0.00%	0.70%	0.00%	100.00%
94'-98' Ranking	3	5	1	5	2	10	4	7	10	8	10	9	10	
1999	3	0	4	1	6	0	0	8	0	0	0	0	0	22
2000	3	4	5	0	0	0	0	5	0	1	1	0	0	19
2001	4	3	7	0	0	0	0	9	1	1	4	0	0	29
2002	1	8	14	0	0	0	0	8	0	0	15	0	0	46
2003	2	4	12	0	3	0	0	0	0	0	17	4	0	42
99'-03' Counts	13	19	42	1	9	0	0	30	1	2	37	4	0	158
99'-03' Percentage	8.23%	12.03%	26.58%	0.63%	5.70%	0.00%	0.00%	18.99%	0.63%	1.27%	23.42%	2.53%	0.00%	100.00%
99'-03' Ranking	5	4	1	9	6	11	11	3	9	8	2	7	11	
2004	19	5	6	1	0	1	8	3	0	0	0	2	1	46
2005	17	5	10	0	1	0	0	0	0	2	3	9	0	47
2006	8	0	6	3	0	0	11	6	0	1	2	6	0	43
2007	3	4	2	0	0	0	14	10	1	4	5	1	0	44
2008	0	8	1	1	0	1	30	3	0	5	2	1	0	52
04'-08' Counts	47	22	25	5	1	2	63	22	1	12	12	19	1	232
04'-08' Percentage	20.26%	9.48%	10.78%	2.16%	0.43%	0.86%	27.16%	9.48%	0.43%	5.17%	5.17%	8.19%	0.43%	100.00%
04'-08' Rank	2	4	3	9	11	10	1	4	11	7	7	6	11	
Total Counts	86	46	120	11	43	2	77	55	2	16	49	24	1	532
Overall Percentage	16.17%	8.65%	22.56%	2.07%	8.08%	0.38%	14.47%	10.34%	0.38%	3.01%	9.21%	4.51%	0.19%	100.00%
Overall Ranking	2	6	1	10	7	11	3	4	11	9	5	8	13	

### Classification Results Summary-Accounting Area

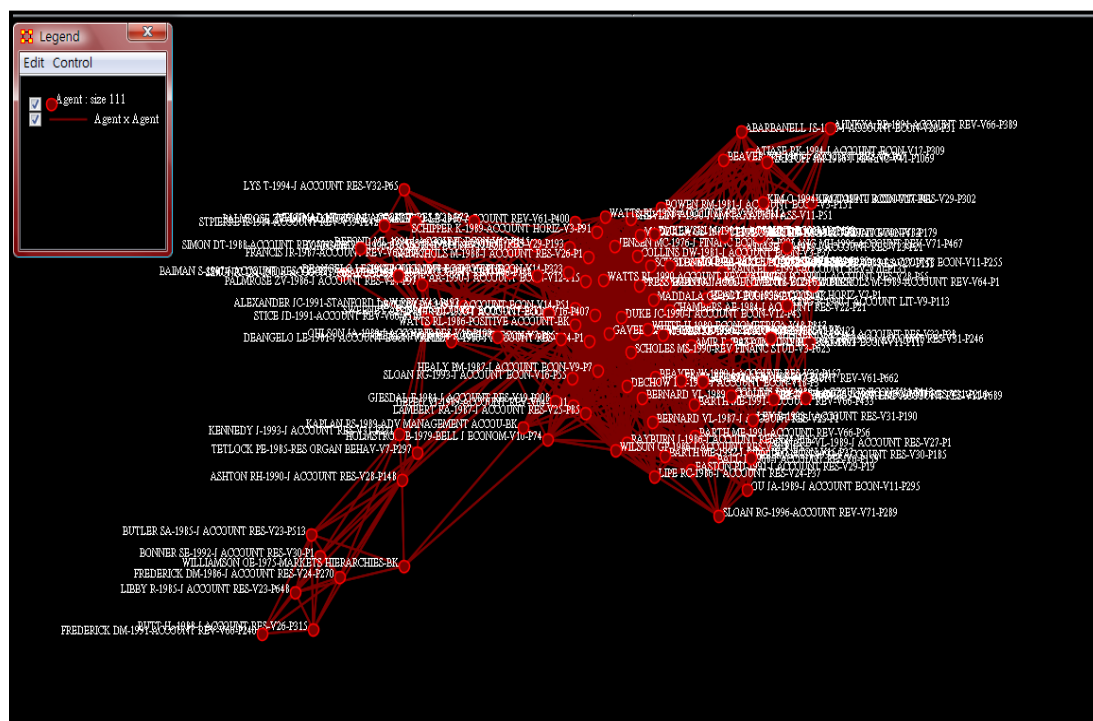
<b>D. Accounting Area</b>							
<i>Code</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	
<b>Taxon Class Name/Year</b>	<b>Tax</b>	<b>Financial</b>	<b>Managerial</b>	<b>Audit</b>	<b>Information Systems</b>	<b>Mixed</b>	<b>Total Articles</b>
1994	2	16	7	9	0	0	34
1995	5	14	3	7	0	0	29
1996	0	19	5	4	0	0	28
1997	1	15	3	6	0	2	27
1998	3	15	1	4	0	1	24
<b>94'-98' Counts</b>	<b>11</b>	<b>79</b>	<b>19</b>	<b>30</b>	<b>0</b>	<b>3</b>	<b>142</b>
<b>94'-98' Percentage</b>	<b>7.75%</b>	<b>55.63%</b>	<b>13.38%</b>	<b>21.13%</b>	<b>0.00%</b>	<b>2.11%</b>	<b>100.00%</b>
<b>94'-98' Ranking</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>5</b>	
1999	2	10	2	7	0	1	22
2000	2	10	3	4	0	0	19
2001	4	13	4	7	0	1	29
2002	2	27	9	7	1	0	46
2003	2	22	6	11	0	1	42
<b>99'-03' Counts</b>	<b>12</b>	<b>82</b>	<b>24</b>	<b>36</b>	<b>1</b>	<b>3</b>	<b>158</b>
<b>99'-03' Percentage</b>	<b>7.59%</b>	<b>51.90%</b>	<b>15.19%</b>	<b>22.78%</b>	<b>0.63%</b>	<b>1.90%</b>	<b>100.00%</b>
<b>99'-03' Ranking</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>5</b>	
2004	4	23	7	10	0	2	46
2005	0	27	9	8	0	3	47
2006	1	24	6	5	0	7	43
2007	1	22	8	6	0	7	44
2008	1	35	7	6	0	3	52
<b>04'-08' Counts</b>	<b>7</b>	<b>131</b>	<b>37</b>	<b>35</b>	<b>0</b>	<b>22</b>	<b>232</b>
<b>04'-08' Percentage</b>	<b>3.02%</b>	<b>56.47%</b>	<b>15.95%</b>	<b>15.09%</b>	<b>0.00%</b>	<b>9.48%</b>	<b>100.00%</b>
<b>04'-08' Ranking</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	
<b>Total Counts</b>	<b>30</b>	<b>292</b>	<b>80</b>	<b>101</b>	<b>1</b>	<b>28</b>	<b>532</b>
<b>Overall Percentage</b>	<b>5.64%</b>	<b>54.89%</b>	<b>15.04%</b>	<b>18.98%</b>	<b>0.19%</b>	<b>5.26%</b>	<b>100.00%</b>
<b>Overall Ranking</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>5</b>	



### Classification Results Summary-Foundation Discipline

<b>E. Foundation Discipline</b>											
<i>Code</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	
<b>Taxon Class Name/Year</b>	<b>Psychology</b>	<b>Sociology, Political Science, Philosophy</b>	<b>Economics &amp; Finance</b>	<b>Engineering, Communications &amp; Computer Science</b>	<b>Mathematics, Decision Sciences, Game Theory</b>	<b>Statistics</b>	<b>Law</b>	<b>Other Mixed</b>	<b>Accounting</b>	<b>Management</b>	<b>Total Articles</b>
1994	0	1	5	0	0	0	0	0	28	0	34
1995	4	0	4	0	1	0	0	0	20	0	29
1996	4	0	4	0	0	3	0	0	17	0	28
1997	5	0	5	0	1	0	0	0	16	0	27
1998	1	0	9	0	3	0	1	0	9	1	24
<b>94'-98' Counts</b>	<b>14</b>	<b>1</b>	<b>27</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>90</b>	<b>1</b>	<b>142</b>
<b>94'-98' Percentage</b>	<b>9.86%</b>	<b>0.70%</b>	<b>19.01%</b>	<b>0.00%</b>	<b>3.52%</b>	<b>2.11%</b>	<b>0.70%</b>	<b>0.00%</b>	<b>63.38%</b>	<b>0.70%</b>	<b>100.00%</b>
<b>94'-98' Ranking</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>9</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>9</b>	<b>1</b>	<b>6</b>	<b>-</b>
1999	1	1	6	0	3	0	0	0	11	0	22
2000	5	2	5	0	0	0	0	0	6	1	19
2001	5	0	9	1	2	0	0	0	12	0	29
2002	5	0	20	1	1	0	0	0	13	6	46
2003	3	2	13	0	6	0	0	0	17	1	42
<b>99'-03' Counts</b>	<b>19</b>	<b>5</b>	<b>53</b>	<b>2</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>8</b>	<b>158</b>
<b>99'-03' Percentage</b>	<b>12.03%</b>	<b>3.16%</b>	<b>33.54%</b>	<b>1.27%</b>	<b>7.59%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>37.34%</b>	<b>5.06%</b>	<b>100.00%</b>
<b>99'-03' Ranking</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>7</b>	<b>4</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>-</b>
2004	5	7	19	1	4	0	2	0	7	1	46
2005	5	5	19	0	2	0	0	0	15	1	47
2006	2	4	16	0	0	0	0	0	18	3	43
2007	4	1	10	0	3	0	0	0	24	2	44
2008	1	0	15	0	0	0	0	3	31	2	52
<b>04'-08' Counts</b>	<b>17</b>	<b>17</b>	<b>79</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>95</b>	<b>9</b>	<b>232</b>
<b>04'-08' Percentage</b>	<b>7.33%</b>	<b>7.33%</b>	<b>34.05%</b>	<b>0.43%</b>	<b>3.88%</b>	<b>0.00%</b>	<b>0.86%</b>	<b>1.29%</b>	<b>40.95%</b>	<b>3.88%</b>	<b>100.00%</b>
<b>04'-08' Ranking</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>9</b>	<b>5</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>1</b>	<b>5</b>	<b>-</b>
<b>Total Counts</b>	<b>13</b>	<b>286</b>	<b>49</b>	<b>26</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>68</b>	<b>55</b>	<b>22</b>	<b>532</b>
<b>Overall Percentage</b>	<b>2.44%</b>	<b>53.76%</b>	<b>9.21%</b>	<b>4.89%</b>	<b>0.00%</b>	<b>1.32%</b>	<b>1.13%</b>	<b>12.78%</b>	<b>10.34%</b>	<b>4.14%</b>	<b>100.00%</b>
<b>Overall Ranking</b>	<b>7</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>10</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>-</b>

### Network of Influential Citations in TAR: 1994-1998 Period











References- First Author	Yr	Jr	Ref. Title	Research Method	Mode of Reasoning	School of Thought	Information	Treatment	Accounting Area	Foundation Discipline
Group 1- Accruals Anomaly, Earnings Management, and Cost of Capital				Summary						
Sub-group 1-1			The Effect of Earnings Management on Firm Performance	Archival- Primary/ Secondary	Quantitative- Regression	Statistical Modeling/ Accounting Theory	Security Prices & Returns	Financial Accounting/ Information Structure	Financial Accounting	Accounting
Sweeney	1994	JAE	DEBT-COVENANT VIOLATIONS AND MANAGERS' ACCOUNTING RESPONSES							
Rangan (Core)	1998	JFE	EARNINGS MANAGEMENT AND PERFORMANCE OF SEASONED EQUITY OFFERINGS							
Teoh	1998	JFE	EARNINGS MANAGEMENT AND UNDERPERFORMANCE OF SEASONED EQUITY OFFERINGS							
Teoh	1998	JF	EARNINGS MANAGEMENT AND THE LONG-RUN MARKET PERFORMANCE OF INITIAL PUBLIC OFFERINGS							
Shivakumar	2000	JAE	DO FIRMS MISLEAD INVESTORS BY OVERSTATING EARNINGS BEFORE SEASONS EQUITY OFFERINGS?							
Sub-group 1-2			The Roles of Discretionary Accruals & Earnings Management							
Fama	1973	JPE	RISK, RETURN, AND EQUILIBRIUM: EMPIRICAL TESTS							
Jones (Core)	1991	JAR	EARNINGS MANAGEMENT DURING IMPORT RELIEF INVESTIGATIONS							
Fama	1993	JFE	COMMON RISK FACTORS IN THE RETURNS ON STOCKS AND BONDS							
Defond	1994	JAE	DEBT COVENANT VIOLATION AND MANIPULATION OF ACCRUALS							
Dechow (Core)	1995	TAR	DETECTING EARNINGS MANAGEMENT							
Sloan	1996	TAR	DO STOCK PRICES FULLY REFLECT INFORMATION IN ACCRUALS AND CASH FLOWS ABOUT FUTURE EARNINGS?							
Defond	1998	JAE	AUDITOR CHANGES AND DISCRETIONARY ACCRUALS							
Aboody	2000	JAE	CEO STOCK OPTION AWARDS AND THE TIMING OF CORPORATE VOLUNTARY DISCLOSURES							
Dechow	2000	AH	EARNINGS MANAGEMENT: RECONCILING THE VIEWS OF ACCOUNTING ACADEMICS, PRACTITIONERS AND REGULATORS							
McNicholas	2000	JAPP	RESEARCH DESIGN ISSUES IN EARNINGS MANAGEMENT STUDIES							
Xie	2001	TAR	THE MISPRICING OF ABNORMAL ACCRUALS							
Dechow	2002	TAR	THE QUALITY OF ACCRUALS AND EARNINGS: THE ROLE OF ACCRUAL ESTIMATION ERRORS							
Hribar (Core)	2002	JAR	ERRORS IN ESTIMATING ACCRUALS: IMPLICATIONS FOR EMPIRICAL RESEARCH							
Chung	2003	TAR	CLIENT IMPORTANCE, NONAUDIT SERVICES, AND ABNORMAL ACCRUALS							
Kothari	2005	JAE	PERFORMANCE MATCHED DISCRETIONARY ACCRUAL MEASURES							
Sub-group 1-3			The Relationship between Earnings Management, Auditing & Corporate Governance							
Feroz	1991	JAR	THE FINANCIAL AND MARKET EFFECTS OF THE SEC'S ACCOUNTING AND AUDITING ENFORCEMENT RELEASES							
Beasley (Core)	1996	TAR	AN EMPIRICAL ANALYSIS OF THE RELATION BETWEEN THE BOARD OF DIRECTOR COMPOSITION AND FINANCIAL STATEMENT FRAUD							
Dechow	1996	CAR	CAUSES AND CONSEQUENCES OF EARNINGS MANIPULATION: AN ANALYSIS OF FIRMS SUBJECT TO ENFORCEMENT ACTIONS BY THE SEC							
Becker	1998	CAR	THE EFFECT OF AUDIT QUALITY ON EARNINGS MANAGEMENT							
Benish	1999	TAR	INCENTIVES AND PENALTIES RELATED TO EARNINGS OVERSTATEMENTS THAT VIOLATE GAAP							
Francis	1999	AUD	THE ROLE OF BIG 6 AUDITORS IN THE CREDIBLE REPORTING OF ACCRUALS							
Frankel	2002	TAR	THE RELATION BETWEEN AUDITORS' FEES FOR NONAUDIT SERVICES AND EARNINGS MANAGEMENT							
Klein (Core)	2002	JAE	AUDIT COMMITTEE, BOARD OF DIRECTORS CHARACTERISTICS AND EARNINGS MANAGEMENT							
Sub-group 1-4			Disclosure Level & Cost of Equity Capital							
Fama	1992	JF	THE CROSS-SECTION OF EXPECTED STOCK RETURNS							
Botosan (Core)	1997	TAR	DISCLOSURE LEVEL AND THE COST OF EQUITY CAPITAL							
Claus	2001	JF	EQUITY PREMIA AS LOW AS THREE PERCENT-EVIDENCE FROM ANALYSTS EARNINGS FORECASTS FOR DOMESTIC AND INTERNATIONAL STOCK MARKETS							
Gebhardt (Core)	2001	JAR	TOWARD AN IMPLIED COST OF CAPITAL							
Botosan	2002	JAR	A REEXAMINATION OF DISCLOSURE LEVEL AND THE EXPECTED COST OF EQUITY CAPITAL							
Gode	2003	RAS	INFERRING THE COST OF CAPITAL USING THE OHLSON-JUETTNER MODEL							
Easton	2004	TAR	PER RATIOS, PEG RATIOS, AND ESTIMATING THE IMPLIED EXPECTED RATE OF RETURN ON EQUITY CAPITAL							





## **APPENDIX III**

### **Continuous Auditing Literature Directory**

Appendix III can be located at the following link on Rutgers Accounting Web:

[http://raw.rutgers.edu/docs/vc/appendix\\_iii.pdf](http://raw.rutgers.edu/docs/vc/appendix_iii.pdf)

## APPENDIX IV

### Citation and Co-Citation Analysis Statistics

Network Measurements	Emerging Period: 1983-1999	Developing Period I: 2000-2007	Developing Period II: 2008-2011
Reference Size in Total	155	1763	1574
References Size Cited Three Times & More	0	293	209
Unique References	155	58	46
Link Count	1480	1252	884
Network Density	0.123	0.372	0.417
Co-Citation Threshold Applied to Network	0	0.38	0.31
Number of Top Co-Cited Pairs	1	123	58
Research Clusters Identified	0	3	3

## **APPENDIX V**

### **Behavioral Research in Accounting Taxonomy**

Appendix V can be located at the following link on Rutgers Accounting Web:

[http://raw.rutgers.edu/docs/vc/appendix\\_v.pdf](http://raw.rutgers.edu/docs/vc/appendix_v.pdf)

## **APPENDIX VI**

### **Characteristics Index of Behavioral Research in Accounting**

Appendix VI can be located at the following link on Rutgers Accounting Web:

[http://raw.rutgers.edu/docs/vc/appendix\\_vi.pdf](http://raw.rutgers.edu/docs/vc/appendix_vi.pdf)

## **APPENDIX VII**

### **Cross Comparison of Topical Focus and Subtopical Component**

Appendix VII can be located at the following link on Rutgers Accounting Web:

[http://raw.rutgers.edu/docs/vc/appendix\\_vii.pdf](http://raw.rutgers.edu/docs/vc/appendix_vii.pdf)

## CURRICULUM VITAE

### VICTORIA CHIU

Jun 26, 1986	Born in New Jersey, USA.
Sep 2001 - May 2004	Stella Matutina Girls' High School, Taichung, Taiwan.
Sep 2004 - May 2008	B.S. in Management (Major: Accounting), National Changhua University of Education, Taiwan. Recipient of the Academic Excellence Scholarship Award (1st ranked).
Jun 2008 - Jul 2008	Internship at Horwath Accounting Firm, Taichung, Taiwan.
Sep 2008	Joined Ph.D. program at Rutgers Business School.
Jun 2009 - Jun 2010	Part-time Research Assistant to Professor Miklos Vasarhelyi, Rutgers Business School.
Jun 2010	Ph.D. Candidate in Accounting, Rutgers Business School.
May 2011 - Jul 2011	Part-time Instructor (Summer), Rutgers Business School.
Jun 2011	Fellow at the AAA Doctoral Consortium, Lake Tahoe, CA.
Sep 2011 - May 2012	Full-time Instructor, Rutgers Business School.
Sep 2012 - May 2012	Dean's Distinguished Graduate Instructorship, Rutgers Business School.
Oct 2013	Ph.D. in Accounting, Rutgers University, Newark, NJ. Dissertation: Accounting Bibliometrics: The Development and Intellectual Structure of Accounting Research Dissertation Chair: Professor Miklos A. Vasarhelyi