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HOW ACCOUNTING ACADEMICIANS CAN USE CITATION INDEXING AND ANALYSIS FOR RESEARCH

George O. Gamble
THE UNIVERSITY OF HOUSTON—UNIVERSITY PARK
and
Brian O'Doherty
EAST CAROLINA UNIVERSITY

Abstract: With the rapid increase in the accounting research arena over the past decade there has arisen the need for new tools to facilitate the research process. This paper presents citation indexing and analysis as two such tools. It presents some of the ways in which citation indexing and analysis have been used to perform scholarly research and it shows how citation indexing and analysis can be used for conducting historical research using a simplified accounting example.

The accounting academic arena has grown in leaps and bounds over the past ten years due to a sharp increase in the demand for accountants. Likewise, the number of accounting journals has also increased. For example, in 1974 there were only seven academic accounting journals (in English) and at the end of 1983 there were twenty-one [Dyckman and Zeff, (1984)]. These changes have complicated the task of scholarly research by vastly expanding the knowledge base of accounting. Thus, there is the need for tools that will assist researchers in performing scholarly research. It is our opinion that citation indexing and analysis are two such tools. The objectives of this paper are: (1) to present some of the ways in which citation indexing and analysis have been used to perform scholarly research and (2) to provide a specific example of a use of citation indexing and analysis for conducting historical accounting research.

The concept of citation indexing is simple. Almost all papers, notes, books, monographs, and other publications in accounting contain citations. Each citation generally includes information regarding title, author, and where and when published for the cited document. Documents are normally cited because they support, provide precedent for, illustrate, or elaborate on what the citing author has to say (this point will be illustrated in the section entitled "Data Analysis"). Hence, citations are the formal linkages between papers that have unique points in common. A citation index is structured around these linkages. It lists publications that have been referenced in subsequent papers and identifies the sources of the citations. Citation analysis is concerned with the mathematical manipulation of those citations generated from a citation index.

HISTORICAL DEVELOPMENT OF CITATION INDEXING

The oldest major citation index in existence was started in 1873 by Shepard. Shepard's citations were started to provide the legal profession with a tool for searching legal decisions via "listing the citations to precedents used in the cases decided by federal and state courts and various federal administrative agencies" [Garfield, (1979)]. During the late 1950's and early 1960's a series of elaborate citation indexes were developed that tested the feasibility and utility of the idea more thoroughly. In 1959, the *Journal of American Statistical Association* published a cumulative citation index to its volumes 35 through 50. The annals of Mathematical Statistics did the same thing in 1962 for its first 31 volumes. Also published in 1962 was a citation index to the *Bibliography of Non-Parametric Statistics.* All three of these indexes were one-time efforts that were selective in the references listed. The indexes to the two journals listed only references to the journals; the one to the bibliograph listed only references to other items in the bibliograph [Garfield, (1979)].

With the burgeoning of the scientific enterprise that occurred following the second world war, traditional indexes and abstracts began to be overwhelmed. Weinstock [1981, p. 29] mentions that there were publication delays of six months to several years and that the sudden increase in scientists caused many of the traditional disciplinary boundaries to be breached. The older subject indexes that covered only one field of study were starting to restrict the flow of valuable knowledge from one discipline into another. Besides these problems due to growth, problems of ambiguous classification and inability to assign labels to new concepts also existed. What was needed was a system that was current, could index across disciplines, and did not rely on the intellectual judgments of indexers.

In 1961, under the leadership of Eugene Garfield, the Institute for Scientific Information (ISI) developed the first multidisciplinary data base to the scientific literature—the *Science Citation Index.* Since 1961, the ISI has developed two additional multidisciplinary indexes: The *Social Science Citation Index* (SSCI) [1973] and the *Arts and Humanities Citation Index* [1978]. With regard to the indexes developed by the ISI, the SSCI is the index that is relevant to accounting researchers (the Business, Finance publications used by the SSCI in 1983 are contained in Appendix A).[1]

The SSCI is a quarterly index (with annual and five year accumulations) compiled from the references and bibliographies found in the articles in more than 1,400 source journals (plus some books, mainly annuals). The breadth of coverage is extremely wide: the source journals include virtually all major research oriented journals. The SSCI is organized alphabetically, by first

[1]The publications contained in Appendix A represent *one* subject category for source journals. The other business related subject categories are Business, Personnel Management, and Economics. Thus, Appendix A is presented to give the reader an idea of the *accounting journals* that are used by the SSCI as source journals. Therefore, in an attempt not to alter the classification scheme developed by the SSCI, all journals classified in the same subject category as accounting journals are listed

author of items cited in footnotes or bibliographies of a source article. Each citation is followed by a short bibliographic description of the source article which contained the reference. The Source Index gives a complete bibliographic description of each source item processed, and unlike other author indexes, includes the reference list of each item.[2]

SOME USES OF CITATION INDEXING AND ANALYSIS

As the research process becomes more complex and competitive, the need arises for newer evaluative techniques with regard to research quality. Citation indexing and analysis have played a major role in the natural and social sciences for evaluating research quality. Price [1963, p. 75] made the following comments regarding citation counts as a measure of research quality:

> Amount of use seems intuitively to be a better test of quality than our former criterion, amount of productivity. Unfortunately though we now have figures for the utility of journals in terms of their rate of usage by a large population, we have no comparable figures for individual papers. It seems almost inevitable on qualitative grounds alone that the same conditions would apply, and that there would be a Pareto-like distribution linking a hierarchy of most popular papers at the top end of the scale with a low-ranking group used twice, or once, or perhaps never.

The validity of citation counts, as a measure of research quality, has been empirically tested in a number of studies. For example, K. E. Clark [1954] tested the validity of citation counts in the field of psychology by comparing citation counts to the rankings by a panel of experts of people they felt had made the most significant contributions to their specialties. He found that citation counts correlated better with the experts' rankings than did the number of papers published, income, and number and quality of their students. Similar correlation studies by Bayer and Folger [1966] and Orr and Kassab [1965] also found strong correlation between citation counts and peer group judgments. Robinson and Adler's study [1981] was similar to the aforementioned studies except that correlation analysis was not performed, they generated a list of 31 authors based on citation counts and compared their list to the American Marketing Association list of 31 authors generated via a poll of marketing educators. Sixteen marketing scholars appeared on both lists. Finally, a study by the ISI showed that Nobel Prize Winners for the period [1950-1964] had a group citation average over the 15 year period of

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[2]The SSCI is not limited to a Citation Index and a Source Index, but includes a Permuterm Subject Index (PSI) and a Corporate Index (CI). The PSI is used when the researcher knows the subject area he/she wishes to study, but does not know of authors who conducted research in the area. After finding an author's name in the PSI, the researcher can consult the Source Index for the title along with certain of the article's bibliographic data. The CI is used when a researcher is interested in finding out a source article's author organization (e.g., institutional affiliation). It is interesting to note that the CI makes it possible for a researcher to check paper productivity for various accounting departments. In addition to the above, the ISI also has a bibliometric analysis of Social Science journals in its data base.

2,877 as compared to the average cited author's count of only 50 [Garfield, (1979)].[3]

In other disciplines, citation analysis has also been used to evaluate such items as the differences in impact of papers published in different journals [Dieks and Chang, (1976)], the relative impact of journals published [White and White (1977)]; Liebowitz and Palmer [1984]; McMurtray and Ginski [1972]; Garfield [1972], the flow of information between related disciplines [Back, (1974)], growth of professional literature [Holt and Schrank, (1968)] citation practices of doctorates [Stigler and Friedland, (1975)] and the pattern of citation practices [Stigler and Friedland (1979)].

Several papers in accounting have used citation analysis. McRae [1974] focused his research efforts on defining an accounting network based on a citation analysis of the flow of messages between the accounting discipline and other disciplines, and the flow of messages within the accounting discipline. Dyckman and Zeff [1984] used citation analysis to aid them in evaluating the first 20 years of publication of the *Journal of Accounting Research.* Brown and Gardner [1985] used citation analysis to assess the overall impact of major research journals on contemporary accounting research, and to identify those specific articles having the greatest impact on contemporary accounting research.

HISTORICAL RESEARCH USE OF CITATION ANALYSIS

The potential usefulness of references for historical research was suggested by Garfield [1955]. Presently, there are two extensively employed techniques that use references as the focal point for conducting historical research—bibliographic coupling and co-citation analysis. Bibliographic coupling is a technique which uses the number of references a selected pair of papers have in common to measure the similarity of their subject matters [Kessler, (1963)]. On the other hand, co-citation analysis is concerned with the number of papers that have cited a selected pair of documents [Small, (1973)]. Price [1976] made the following comments regarding the two techniques: "It turns out that co-citation is rather more useful in practice than co-referencing counts simply because the former uses any body of recent papers to find relationships in the rather stable and permanent archive, while the latter can explore only this year's crop of papers as it is laid down" [p. 230].

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[3]As with any research tool, citation analysis has problems. One of its problems is citation practices. For example, Derek J. de Solla Price might be referenced as D. J. Desollaprice or D. J D. Sollaprice Thus, if one were using the SSCI as his/her source for citation counts, all of the cites made to Derek J. de Solla Price will not be discovered unless the researcher checked all the possible variations on the author's name (including incorrect ones). The SSCI also presents a problem regarding multiple authorship because each paper is listed only under the name of the first author of the paper. Thus, if a person is never a first author his name will never appear in the SSCI (for discussion of this problem see Long, McGinnis and Allison [1980] and Lindsey [1980]). Additional problems associated with citation analysis are located in the "Concluding Observations."

Co-citation analysis has been applied to the natural sciences literature [Small and Griffith, (1974)] and the social and behavioral sciences literature [Griffith, (1976)]. The following comments by Griffith [1976] summarizes the importance of co-citation analysis as an historical research tool:

> . . . . For the first time, it is possible to identify a specialty literature and observe its structure, its relation to other specialized literature and its pattern and rate of change. Size and time dimensions of the product of science can, now, be considered—even if the use of the measure is still at a first, primitive stage.
>
> The primary structural unit which emerges in the natural sciences is the narrow subject matter specialty, in which links among closely related papers are very strong. The promise inherent in the ability to monitor changes in the structure of these specialty clusters is that it will yield new insights into processes of growth and response to scientific discovery. On a broad scale, the mapping of inter-specialty relationship provides a tool for monitoring changes in the structure of the natural sciences as a whole [pp. 254-255].

An example of mapping a specialty cluster with the aid of co-citation analysis is presented in the following section using income smoothing for the years 1952-82.[4]

Data Collection

Before the mapping of a specialty occurs, a source index and a citation index must be compiled. Our source index is the result of an attempt to gather every published article in English that has ever been written on the topic of smoothing of accounting income.[5] Thus, only articles whose primary focus was on the smoothing of accounting income were included. The authors' judgment was used to determine whether an article was a smoothing article or not. Hofstedt [1976] and Dyckman and Zeff [1984] used the same approach in their attempt to evaluate the accounting literature. Generally, the title or abstract was enough to classify an article. Where this did not suffice, the reference list or footnotes were checked to see if other smoothing articles were referenced; if they were, the text of the referencing article was studied to determine the classification. An article was not classified as smoothing if it dealt with smoothing in a passing manner, i.e., more as a possible extension rather than the focus of the paper. Several articles that were concerned with the time-series properties of accounting income did this.

The first step in compiling our index was to locate earlier articles by tracing references backwards from more recent ones. The second way was to search the SSCI data base using the DIALOG on-line searching system. The SSCI data base covers the entire social science spectrum (from 1972 to present) so special care was needed to avoid getting unnecessary articles. The DIALOG

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[4]Small and Griffith [1974] have developed a method for identifying clusters of papers that are linked by specific levels of co-citation strength. The clusters determined by the algorithm are called specialties. However, the actual determination of accounting specialties is beyond the scope of this paper. Thus we are using income smoothing as a specialty.

[5]Working papers have been excluded from our analysis because we are concerned with the co-citation strength between published articles. Furthermore, based upon the references we observed in the smoothing articles we found that a high percentage of the smoothing working papers were subsequently published.

system searches article titles for key words or combinations of words. We searched using the terms *smoothing* and *manipulation*, either of which had to be used with the terms *income* or *accounting*. Furthermore, in an attempt to uncover additional smoothing articles that did not use the above couplet of key words in their title, we also searched for articles using the two words *accounting changes* in their title. A total of 29 articles were discovered using the on-line searching system, 15 of these dealt with *accounting changes*, but only three of the latter were on smoothing. One article with *accounting* and *manipulation* in its title was not a smoothing article.

The *Accountants' Index*, using the on-line computer searching system ORBIT IV, was the third way in which smoothing articles were discovered. It should be noted that the major advantage the SSCI has over the *Accountants' Index* is its multi-disciplinary coverage of subject matters. Because of the narrower disciplinary focus in the *Accountants' Index*, the terms that were searched were *smoothing, manipulation,* and *accounting changes*. The terms *smoothing* and *manipulation* could stand alone and did not have to be linked to either the terms *income* or *accounting*. A useful feature of the ORBIT IV system is that it searches for key terms not only in an article's title but also in the index terms that are assigned to each article. Thus, it is possible to discover articles on smoothing that have titles with no obvious connection with the topic. An article by Brooks and Buckmaster [1980] was discovered this way. It is interesting to note that three articles concerning income smoothing were not classified under that subject term; all three were classified under the specialized industries with which they dealt.

The smoothing citation index was compiled from the source index. Each smoothing article was set up as a separate record and a chronological list of citations to the smoothing articles was developed.

Data Analysis

Our search for income smoothing papers lead us to sixty-five papers (see Table 1). Fifty-four percent of the smoothing papers located were published in the *Journal of Accounting Research* and *The Accounting Review;* of that fifty-four percent, the *Journal of Accounting Research* accounted for thirty-one percent and *The Accounting Review* twenty-three percent. Ronen is the most prolific author in the income smoothing area with ten papers (see Table 2). However, these ten papers yielded twenty-three citations as compared to fifty-one citations for four papers by Copeland. Gordon has the highest citation rate per article followed by Copeland.

The information collected on smoothing articles and citations will be used to construct a citation diagram (map).[6] Citation diagrams have been used for diverse purposes. For example, Garfield [1963] suggested that citation indexing and the construction of historical "maps" would be of potential value for historical research. Later, Garfield [1964] investigated the history of the

[6] A citation diagram is constructed based on the assumption that an approximately contemporary set of units of information may be arranged on a plane so that each unit is near to those units to which it relates strongly and far from those relating weakly or not at all. For an extensive discussion of mapping see Price [1965]

Genetic Code, demonstrating the significance of modal papers in a map (network) and the coalescence of protein chemistry, genetics, and nucleic acid chemistry. Price [1965] has discussed the existence of research fronts identified by a tightly knit group of new papers coupled to a small select part of the earlier literature by citation links; a very early stage in the development of such a front is characterized by a small group of inter-citing papers.

Co-citation analysis will be used to formulate the citation diagram for the income smoothing literature. Co-citation analysis is used because:

> this two-dimensional model is very workable, and that is odd because one might have supposed that relationships between items of knowledge and information would be so highly complex that any order would be very multi-dimensional. What seems to be happening is that the first step from one dimension in the ordering of knowledge to two is so radical that higher orders merely yield slight improvement [Price, (1976, pp. 250-251)].

Co-citation analysis commences with the determination of the most cited papers in a specialty. For this illustration, a highly cited paper has been defined as a paper with ten or more citations. Table 3 contains those papers which satisfy the highly cited criterion (Table 4, row one, contains all of the co-citations for the thirteen papers). The next step in performing co-citation analysis is the determination of co-citation strength between pairs of papers. The strength of co-citation between two papers can be easily determined from a source index. Each of the two papers is used to scan the references of each source item, from the source index, to determine the number of identical citing items. An identical citing item is simply an article which has cited both papers earlier; therefore, co-citation is the frequency with which two items of earlier literature are cited together by the later literature. Thus, co-citation strength is a measure of the number of times a pair of papers is jointly cited by a source item. It should be noted that in measuring co-citation strength, we measure the degree of relationship or association between papers as perceived by the population of citing authors [Small, (1973)].

Each of the thirteen articles in Table 3 was paired with every other article to generate twelve pairs for each article. Each of the two papers was used to scan the references of each source item (See the section entitled "Data Collection" for an explanation of how the source documents were selected) to determine the number of identical citing papers. Figure 1 was developed based upon the number of identical citing items for each pair of papers. Thus, Figure 1 is no more than a "Co-citation Network for Frequently Cited Income Smoothing Papers." The below scale was used to select those relationships between papers that would be included in the network and to provide a way to display the co-citation strength between the papers:

Co-citation	Lines
1-5	Not shown
6-10	1
11-15	2
16-20	3

Figure 1 provides some interesting insights. First, Gordon [1966] and Copeland [1968, JAR] have the strongest co-citation strength (frequency) with the other smoothing papers. Second, income smoothing has a research front, in the sense that more recent papers are linked to a small select part of the earlier income smoothing papers.[7] Third, there has been a structural shift in the income smoothing literature. That is, the first few income smoothing papers focused on the formulation of the income smoothing hypothesis and the later ones focused on the testing of that hypothesis. The structural shift in the smoothing literature helps to explain why Hepworth [1953], the first author of an accounting smoothing paper written in English, at least, does not have a strong co-citation link with the other highly cited smoothing papers and Gordon [1966] and Copeland [1968, JAR] do. Fourth, forty-six percent of the papers that appear in the map were published in JAR followed by the AR with thirty-one percent. Figure 1 also suggests a very interesting question: What caused certain papers to have strong co-citation links? The next two paragraphs will provide an answer to that question for those papers with two or more lines in Figure 1.

Gordon et al. [1966] and Copeland [1968, JAR], Copeland [1968, JAR] and Cushing [1969], and Gordon et al. [1966] and Gordon [1964] are perceived by the population of citing authors to have the strongest relationship or association among the thirteen papers. A content analysis[8] of the above papers reveals the following regarding why these papers are so strongly related:

1) Copeland [1968, JAR] summarized and critically evaluated Gordon et al.'s [1966] empirical test of the income smoothing hypothesis.
2) Cushing [1969] referred to Copeland [1968, JAR] as a summary paper, commented on Copeland's attributes of a perfect smoothing device, and criticized Copeland's research methodology.
3) Gordon et al. [1966] empirically tested Gordon's [1964] hypothesis on income smoothing.

Copeland [1968, JAR] and Dascher [1970], Copeland [1968, JAR] and Archibald [1967], Copeland [1968, JAR] and White [1970], Gordon et al. [1966] and Dascher [1970], Gordon et al. [1966] and Cushing [1969], Gordon et al. [1966] and Archibald [1967], Gordon et al. [1966] and Copeland [1968, AR], Copeland [1968, AR] and Archibald [1967], Archibald [1967] and Cushing [1969], Dascher [1970] and White [1970], and Copeland [1968, JAR] and Copeland [1968, AR], are perceived by the citing authors to have a strong relationship or association among the thirteen papers. A content analysis of the above papers reveals the following regarding why these papers are strongly related:

1) Dascher [1970] mentioned Copeland [1968, JAR] as an empirical study that used a different curve than theirs to measure variation in income. He also

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[7] Price [1965] made the following comments regarding a research front: ". . since only a small part of the earlier literature is knitted together by the new year's crop of papers, we may look upon this small part as a sort of growing tip or epidermal layer, an active research front." [p. 512] In terms of the smoothing literature, the research front is composed of Gordon [1964], Gordon et al. [1966], Copeland [1968], and Cushing [1969].

[8] A content analysis was made to determine whether an author was directly cited by another.

confirmed one of Copeland's observations regarding the time period used to study smoothing practices.

2) Copeland [1968, JAR] summarized Archibald [1967] and critically evaluated his study.
3) White [1970] mentioned that his study was designed to avoid some of the methodological problems discussed by Copeland [1968, JAR].
4) Dascher [1970] mentioned that the results of Gordon et al.'s [1966] test of the income smoothing hypotheses were not conclusive.
5) Cushing [1969] referred to Gordon et al. [1966] as the first empirical study to study the effects of accounting policy decisions on financial reports.
6) Archibald [1967] mentioned that Gordon et al. [1966] tested the income smoothing hypothesis first suggested by Hepworth and extended by Gordon [1964].
7) Copeland [1968, AR] mentioned that Gordon et al. [1966] attempted to support Gordon's [1964] income smoothing hypothesis with empirical data but only achieved inconclusive results.
8) Copeland [1968, AR] did not mention Archibald [1967].[9]
9) Cushing [1969] did not mention Archibald [1967].[10]
10) White [1970] mentions that he has designed his study like Dascher [1970] to avoid some of the methodological problems discussed by Copeland [1968, JAR]
11) Copeland [1968, JAR] summarized Copeland [1968, AR]

Table 4 displays the relationship between bibliographic coupling strength, co-citation strength, and direct citations. As was previously stated, bibliographic coupling is concerned with the sharing of common references by two documents. Thus, the bibliographic coupling strength for pairs of papers in Table 4 was determined by counting their common references. A direct citation is no more than the citing of one paper by another. Hence, the direct citations in Table 4 were determined by reading each of the thirteen highly cited papers.

Notice in Table 4 the absence of any clear relationship between bibliographic coupling strength and co-citation strength. This is especially evident in the case of Copeland [1968, JAR] and Cushing [1969]. These papers have a bibliographic coupling strength of only three and a co-citation strength of sixteen. A reading of Cushing's paper reveals why it came to be so closely associated with Copeland's paper and, furthermore why, in terms of co-citation analysis, it was strongly linked to Gordon et al. [1966] (however, the bibliographic coupling strength is only one). In the first and second paragraphs of his paper, Cushing made the following comments:

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[9]Copeland did not mention Archibald because he focused his attention on the manipulation of income given a particular accounting method. On the other hand, Archibald focused his attention on relating income smoothing to accounting change, i.e , a change from one accounting principle to another Thus, accounting researchers have linked Copeland and Archibald because their central theme was the same

[10]Cushing did not directly cite Archibald because he referred readers to Copeland [1968, JAR] as a review paper for prior empirical research. For example, in footnote 4 the following was stated. "The only recent empirical study not summarized . " However, accounting researchers linked Cushing and Archibald because their empirical efforts were the same, i.e., they were both concerned with accounting change and income smoothing.

> . . . . Gordon, Horwitz, and Myers first used a smoothing criterion for assessing these effects. Other more recent empirical studies in which this criterion was adopted have been summarized and evaluated by Copeland . . . . This paper is also a report of a study of the effects of changes in accounting policy on the reported earnings . . . . Emphasis was on the income smoothing effects of such changes . . [pp. 196-197].

Thus, two papers which were strongly linked by co-citation were only weakly tied by bibliographic coupling, although they were clearly related in content. Table 4 also reveals that direct citation does not predict all strong co-citation linkages between papers in a field (see, for example, Archibald [1967] and Cushing [1969]. However, it more closely parallels co-citation linkages than does bibliographic coupling. That is, of the 13 cases with eleven or more co-citations, eleven had a direct citation and none had a comparable bibliographic coupling and co-citation strength.

SUMMARY

Since the development of citation indexes by the Institute for Scientific Information (ISI), citation indexing and analysis have been extensively used to perform scholarly research in the areas of the natural, behavioral, and social sciences. Citation analysis is an up and coming research tool in accounting, because of the tremendous increase in the number of accounting professors, journals, and publications. Thus, it will prove to be of immense value as the accounting profession attempts to evaluate its many dimensions, i.e., accounting researchers, journals, doctoral programs, the impact of other disciplines on accounting, the impact of accounting on other disciplines, etc. As with any research tool, citation analysis has its problems.

One major problem associated with citation analysis is why a particular document is cited, i.e., was it cited to refute, support, apply, compare, or simply make note of a concept. Thus, a citation context analysis must be performed on papers to determine their scholarly merit. The clientele effect is also a problem with citation analysis. Some authors wish to make a friend look better or to flatter a superior [Garfield, (1979, pg. 63)]. Some authors tend to cite articles in their respective journals with greater frequency than authors in other journals (see for example Dyckman and Zeff [1984, p. 265]). There is also a problem with invisible colleges, i.e., a small group of researchers who are in a growth area and frequently cite each other (see, for example Crane [1972]). Thus, subfield growth must be considered. Menard [1971] demonstrates, using three hypothetical growth patterns: fast, normal, and slow, that "a paper in a rapidly doubling subfield has five times as much chance of being cited as in a slowly expanding one" [p. 21]. Finally, why certain papers are not cited is also a problem. That is, some papers are not cited because they are before their time. Others are not cited because their concepts have been around for such a long time that they become general

knowledge, e.g., Einstein's Theory of Relativity (for a discussion of these problems see Garfield [1983]).

The above problems were only presented so that future researchers can take them into consideration when formulating their research methodology. For as Garfield [1979] points out:

> ". . . the discussion is that none of the criticisms are unfounded. Most of them are based on facets of citation analysis that pose either theoretical or real problems in using the technique to evaluate people. Citation data is subtle stuff. Those using it to evaluate research performance at any level, but particularly at the level of individuals, must understand both its subtleties and its limitations . . . . the problems associated with it can be solved satisfactorily with a reasonable amount of methodological and interpretive effort [p. 241].

Thus the above problems should not be interpreted as reasons against using citation analysis as a research tool. As was presented in the paper, citation analysis has been extensively used in other areas.

The specific accounting example presented in this paper was simplified to bring out the point that once a specialty map is determined some valuable insights emerge. Even though the specialty area was predetermined by us, citation analysis could have been used to determine it [Garfield, (1979, pp. 114-145)]. The specialty was predetermined so that more emphasis could be placed on the construction of the index (which encompasses many man hours). Furthermore, additional analysis could have been performed on the citations and papers themselves (see for example Brown and Gardner [1985]).

TABLE 1

DOCUMENTS IN WHICH SMOOTHING PAPERS APPEARED*

Journal of Accounting Research	20
The Accounting Review	15
The Journal of Finance	2
Financial Analysts Journal	3
The Accounting Journal	3
American Accounting Association Monograph	3
Journal of Accounting, Auditing & Finance	2
Abacus	2
The Journal of Business	1
Management Accounting	1
Journal of Business Finance & Accounting	1
Hospital Financial Management	1
MSU Business Topics	1
Journal of Financial & Quantitative Analysis	1
CPA Journal	1
Quarterly Review of Economics and Business	1
Southern Economic Journal	1
Accounting, Organizations and Society	1
Risk Management	1
Accounting and Business Research	1
Journal of Bank Research	1
Harvard Business Review	1
Accounting and Finance	1
Total	65

*For complete bibliographic references see Appendix B.

TABLE 2

AUTHORS WITH TWO OR MORE SMOOTHING PAPERS*

	Articles	Citations[1]	Citation Per Article
Copeland, R. M.	4	51	12.75
Ball, R. R.	2	21	10.50
Ronen, J.	10	23	2.30
Gordon, M. J.	3	49	16.33
Imhoff, E. A.	3	3	1
Brooks, L.	2	1	.50
Barnea, A. J., Ronen, J.	3	12	4
Schiff, M.	2	8	4
White, Gary E.	2	16	8
Beidleman, C. R.	2	3	1.50
Myers, J. H.	2	3	1.50
Sadan, S.	7	21	3
Kamin, J.	2	0	0
Moore, M.	2	2	1
Horwitz, B. N.	2	26	13
Hepworth, S. R.	2	11	5.50

*For the most part only the name of the first author per article is presented. However, in limited situations co-authors are separately presented if they have written additional papers by themselves or with other co-authors. For complete bibliographic references see Appendix B.

[1]Self-citations have been excluded.

TABLE 3

SMOOTHING PAPERS WITH 10 OR MORE CITATIONS*

First Author	Year	Citations
Archibald, T. R.	1967	22
Copeland, R. M.	1968—JAR	27
Cushing, B. E.	1969	21
Ball, R.	1972	20
Dascher, P.	1970	14
Copeland, R. M.	1968-AR	14
Beidleman, C. R.	1973	11
Gagnon, J. M.	1967	11
Gonedes, N. J.	1972	12
Gordon, M. J.	1966—AAA monograph	26
Gordon, M. J.	1964—AR	20
Hepworth, S. R.	1953	11
White, Gary	1970	14

*Only the name of the first author is presented. For complete bibliographic references see Appendix B.

Figure 1
Co-Citation Network for Frequently Cited Income Smoothing Papers

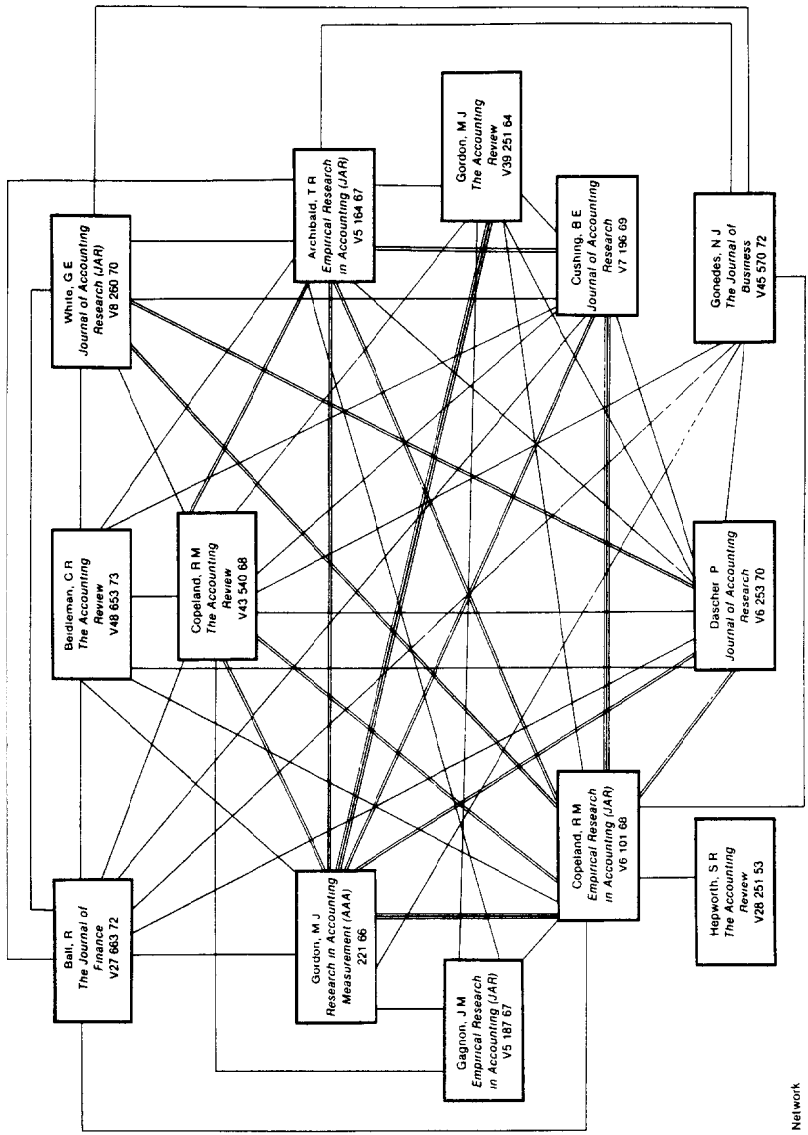

TABLE 4: CO-CITATIONS, BIBLIOGRAPHIC COUPLING, AND DIRECT CITATION BETWEEN PAIRS OF PAPERS

	Copeland—JAR	Cushing	Ball	Dascher	Copeland—AR	Beidleman	Gagnon	Gonedes	Gordon—AAA	Gordon—AR	Hepworth	White	
Archibald	14	11	9	10	11	6	7	6	14	8	4	10	Co-Citation
	3	3	4	2	3	2	3	3	4	0	0	3	Bib. Coupling
	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Direct Citation
Copeland—JAR		16	10	14	14	8	8	8	19	10	7	12	
		3	6	7	3	4	3	6	1	0	0	4	
		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	
Cushing			7	9	7	6	5	4	12	7	3	9	
			4	5	2	3	2	4	1	0	0	3	
			No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	
Ball				6	6	7	2	7	7	3	4	7	
				6	2	4	3	11	2	0	0	3	
				No	Yes	No	Yes	Yes	Yes	No	Yes	No	

TABLE 4: CONTINUED

	Copeland—JAR	Cushing	Ball	Dascher	Copeland—AR	Beidleman	Gagnon	Gonedes	Gordon—AAA	Gordon—AR	Hepworth	White	
Dascher					10	6	4	7	12	7	5	12	Co-Citation
					2	6	2	8	2	0	0	4	Bib. Coupling
					Yes	Yes	Yes	Yes	Yes	Yes	No	No	Direct Citation
Copeland—AR						6	6	6	13	7	4	9	
						2	2	2	2	0	0	2	
						Yes	No	Yes	Yes	Yes	No	No	
Beidleman							2	4	6	2	3	6	
							2	8	1	0	0	3	
							No	No	Yes	Yes	No	Yes	
Gagnon								2	9	6	4	4	
								3	2	0	0	2	
								Yes	Yes	Yes	Yes	No	

TABLE 4: CONTINUED

	Copeland—JAR		Cushing		Ball		Dascher		Copeland—AR		Beidleman		Gagnon		Gonedes		Gordon—AAA		Gordon—AR		Hepworth		White	
Gonedes																	6		1		4		6	Co-Citation
																	1		0		0		4	Bib. Coupling
																	Yes		Yes		Yes		Yes	Direct Citation
Gordon—AAA																			17		5		10	
																			1		1		1	
																			Yes		Yes		Yes	
Gordon—AR																					5		4	
																					0		0	
																					No		Yes	
Hepworth																							5	
																							0	
																							No	

APPENDIX A

Business, Finance Journals used by the SSCI in 1983

Abacus
Accounting, Organizations and Society
The Accounting Review
Banking Law Journal
Barclay's Review
Bulletin for International Fiscal Documentation
Finance and Trade Review
Financial Management
Institutional Investor
International Monetary Fund Staff Papers
Journal of Accountancy
Journal of Accounting and Economics
Journal of Accounting Research
Journal of Corporate Taxation
Journal of Economics and Business
The Journal of Finance
Journal of Financial and Quantitative Analysis
Journal of Financial Economics
Journal of Futures Markets
Journal of Industrial Economics
Journal of Monetary Economics
The Journal of Money Credit and Banking
Journal of Real Estate Taxation
Journal of Risk and Insurance
Journal of Taxation
Lloyds Bank Review
Managerial Finance
National Tax Journal
Public Finance
Public Finance Quarterly
Quarterly Review of Economics and Business
Review of Business and Economic Research
Taxes—The Tax Magazine
Three Banks Review
World Economy
Journal of Marketing
Journal of Marketing Research
The Journal of Business

APPENDIX B

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