

**Audit Firm Concentration and Competition:
Effects of Consolidation Since 1997**

by

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AUDIT FIRM CONCENTRATION AND COMPETITION: EFFECTS OF CONSOLIDATION SINCE 1997

SYNOPSIS: For many years, businesses, government regulators, and the public have expressed concern about the dominance of a few large public accounting firms in the audit market. Recent events have increased concern about the lack of competition in the auditing industry. Using market concentration measures we examine the level of competition among the remaining active audit firms before and after the merger between Price Waterhouse and Coopers & Lybrand and before and after the dissolution of Arthur Andersen. We also segment the audit market by auditor and client size and examine the effects of the consolidating events from these perspectives. We find that concentration did indeed increase after both events but, in most instances, decreased in the years between those two events. However, the remaining Big Four audit firms continue to dominate the market for audits of publicly held companies, particularly audits of large firms. We also find that, while some segments of the audit market are highly concentrated, there are a few segments that are relatively competitive.

Keywords: Audit markets; auditor concentration; audit firm mergers; concentration measures.

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INTRODUCTION

For decades, businesses, government regulators, and the public have expressed concerns about the dominance of a few large public accounting firms in the market for audits. The two most recent consolidating events have increased concerns about the level of competition in the auditing industry. The first event was the merger of Price Waterhouse and Coopers & Lybrand in July of 1998 leaving five large audit firms. Then on August 31, 2002, the firm of Arthur Andersen was dissolved after being convicted on charges related to the Enron accounting scandal. The collapse of one of the “Big” public accounting firms was an unprecedented occurrence. Even though the conviction was later overturned, it was too late to salvage Arthur Andersen. After the dissolution of Andersen, only four “Big” public accounting firms, Ernst & Young, Deloitte & Touche, KPMG Peat Marwick, and PriceWaterhouseCoopers, remained.

When only a few large companies compete for the majority of revenues in an industry, there are a number of potential problems. The dominance of a few large companies in an industry can result in monopolistic pricing. Another issue, which has been exacerbated in the auditing industry by the implementation of the provisions of Sarbanes-Oxley, is the availability of services, especially to certain entities. For example, nonprofit entities, which are generally smaller and often require specialized expertise, have reported difficulty in obtaining audit services at a reasonable cost from a large audit firm.¹ Two other important issues arise from the concentration in the audit industry. The first one is a possible decline in auditor objectivity and independence. For example, when there are only four large audit firms, conflicts of interest, particularly those related to auditing clients that are competitors, are more likely. Additionally, when there are few alternatives available to clients, the threat of losing a client, even a large one, is not as great to an auditor. Consequently, a decline in the quality of audits accompanied by a decrease in the stability of capital markets and in investor confidence may occur.

The other important issue is the potential impact of another large public accounting firm failure. This possibility became more tangible in the years following the dissolution of Andersen. Both KPMG and Ernst & Young were investigated by the Department of Justice for selling schemes to avoid taxes to their clients. Since it was a federal prosecution that led to Andersen’s demise, interested parties around the world expressed concern about the potential consequences of another prosecution of a large audit firm (Buck et al. 2005, 1; Financial Times 2005,

¹ Audrey Williams June wrote in the August 12, 2005 issue of *The Chronicle of Higher Education* that colleges and universities were experiencing difficulty in retaining one of the Big Four audit firms and, when they could, they were being charged more for the services provided.

5). In addition, U.S. regulators raised questions about the knowledge that PriceWaterhouseCoopers had about restatements made by American International Group (AIG), one of its clients (Financial Times 2005, 5). In 2004, Ernst & Young was banned from accepting new audit clients in Japan due to reckless and negligent conduct (The Economist 2006, 16). So it did not take long for what previously was almost unthinkable, the collapse of another large audit firm, to become a fear of many. All three U.S. government reports (GAO 2003, 2008; ACAP 2008) on the auditing industry included a study of the issue of another large audit firm failure.

For decades, it was argued that the competition among the first-tier (Big) auditors was sufficient to maintain auditor independence and quality. Recent events and the current economic and political environment have increased skepticism about the quality of audits and auditors. It is more important than ever that accounting firms perform independent, quality audits and outsiders believe in the integrity of audited financial statements. Evidence of the concern about the audit industry is that the Government Accountability Office (GAO) has conducted two studies in the last six years about consolidation and the level of competition in the public accounting industry. The Department of the Treasury also charged the Advisory Committee on the Auditing Profession (ACAP) with developing recommendations for the auditing profession.

Due to the structural changes in the audit market produced by the recent consolidation events, the potential consequences of these changes, and the important role played by auditing in preserving the integrity of capital markets, we examine the level of competition in the audit market before and after the merger of Price Waterhouse and Coopers & Lybrand and before and after the dissolution of Arthur Andersen. Prior research has found that mergers among the large audit firms have resulted in sharp increases in concentration (Wootton et al. 1994; Wolk et al. 2001; GAO 2003), but most studies have emphasized the largest audit firms and U.S. clients. Therefore, there are two main motivations for our study. First, by examining the changes in concentration in the overall market for audit services we can verify if the results of prior studies hold for the most recent consolidation events. Second, and more importantly, the two most recent consolidating events in the public accounting industry provided opportunities for smaller audit firms to gain market share, particularly in the market for audits of smaller client firms. This perspective has been largely ignored in prior research and provides an opportunity to determine if the smaller firms benefitted from the consolidation events in those markets where they have better opportunities to compete. In addition, the dissolution of Arthur Andersen is a unique event so our examination could provide additional evidence of what might happen if another large public accounting firm would fail.

We believe that the choice of an auditor is a complex one that is influenced by a number of factors. Furthermore, the emphasis of prior studies on the overall market and on the “Big” audit firms disregards the importance of looking at different market niches. We therefore expand our research question to consider if the competitiveness of the audit market significantly changes after the two most recent consolidation events by disaggregating the audit market according to auditor size into three-tier auditor groups. The question is then re-examined by segmenting the audit market according to the size of the client firm.

Consistent with prior studies, we measure the competitiveness of the audit market using four-firm concentration ratios and Herfindahl indices constructed with the market shares of the audit firms based on the number of client firms and based on the square root of client revenues, a proxy for audit fees. We include all audit firms that meet our definition of active² during the years surrounding the two events (1997, 1999, 2001 and 2003). As we discuss in the next section, one of the primary motives for audit firms to merge is to enhance the merged firm’s ability to compete in the provision of global services. We therefore include all U.S. and international client firms.

We find that, for most of our analysis, concentration did indeed increase after the merger and after the dissolution of Arthur Andersen but, in many instances, decreased in the years between those two events³. This is important because it is possible that in the future, the impact of the two most recent consolidating events will weaken and competitiveness will increase. We find that, while some segments of the audit market are highly concentrated, there are a few other segments that are not highly concentrated and, therefore, are relatively competitive among the remaining active public accounting firms. This was particularly true for the smallest audit firms and the smallest clients. However, even in the small client segment, the remaining Big Four audit firms continue to dominate the market. A rather surprising result is that the competitiveness in the second-tier audit firms was lower than in the other tiers.

Our findings about the changes in concentration after the two consolidating events in the overall audit market as well as in client size specializations are consistent with prior research. However, our sample of client firms and audit firms is more complete than the sample used most previous studies. While it was reasonable to expect that smaller audit firms might benefit from the merger and dissolution of Andersen, we find very little

² As explained in the methodology section an active audit firm is an auditor with at least ten clients in at least two years.

³ The increase in concentration after the events, measured by the Herfindahl index is not mechanical or obvious. As will be explained throughout our paper the index is sensitive to both the number of firms in the market and also to how the size (market shares) of the remaining firms change (the ability of the remaining firms to absorb the clients of the prior firms).

evidence that they did. Unless government regulators are willing to aggressively interfere in the market for audit services, it seems unlikely that concentration will decrease, especially in some segments.

Although some of our analyses are similar to the two GAO reports, our study differs from the reports in a number of important ways. First, our detailed assessment of the changes in market shares and concentration after the 1998 merger by segmenting the market by the size of the audit firm and by size of the client is unique to our study. No prior research including the 2003 GAO study provides this perspective. Second, although the GAO 2008 does include a perspective of assessing different segments of the market, our study is more consistent in the computations of the market shares and concentration measures at all levels of analyses. Additionally, we fully report the metrics based on both the number of clients and on the square root of client revenues. This contrasts with the GAO 2008's assessment of the industry, which is less clear in some instances and not consistent with what is normally done in an academic paper in other instances.

The remainder of the paper is organized as follows. The next section summarizes prior research and develops our research questions. The following section describes the methodology used in this study. The third section discusses the results and the last section is concluding remarks.

PRIOR RESEARCH AND RESEARCH QUESTIONS

Effects of Recent Consolidating Events on Overall Competitiveness

Mergers among public accounting firms have been common since the development of auditing as a business. Common reasons for mergers of audit firms include growth through expansion (including outside the U.S.) and diversification. Mergers provide opportunities for returns to scale for the merged firm and specialization in more industries. Until the 1980s, no mergers among the first-tier audit firms had occurred in more than fifty years. In 1986, KPMG merged with Peat Marwick to become the largest accounting firm in the world. The major impetus for this merger was KPMG's desire for a stronger presence in the U.S. The significance of economies of scale was recognized during this time period. There was speculation that some of the smaller remaining "Big" firms would no longer be able to compete effectively with KPMG and Arthur Andersen, which was the second largest accounting firm at the time. The merger of Ernst & Whinney and Arthur Young in 1989 combined firms with complementary strengths, especially geographically. Shortly after this, Deloitte Haskins & Sells merged with Touche Ross for similar reasons.

The merger of Price Waterhouse and Coopers & Lybrand was similar to the mergers that occurred in the 1980s. According to company officials, the primary reason for the 1998 merger was the ability to provide comprehensive services globally to their clients (Wootton et al. 2003). The increasing demand for consulting and technological services was probably also a factor. Prior to the merger, Price Waterhouse was the smallest of the Big Six firms and some observers speculated that the firm might not survive (Wootton et al. 2003). The sudden dissolution of Arthur Andersen in 2002 was a unique and significant event and left only four large public accounting firms.

Prior studies found that mergers among the large audit firms resulted in a sharp increase in concentration. Wootton et al. (1994) found that auditor concentration measures significantly increased after the 1989 mergers. This study focused on the large client market. Although second-tier and third-tier firms were included, only the top eight audit firms were used in calculating concentration measures. Wolk et al. (2001) found an increasing pattern of concentration in the large client market. The increases were particularly large after the 1989 and 1998 mergers. This study also included only the top eight audit firms in calculations and the data for the 1998 merger was pro-forma.

The GAO has issued two reports related to competition in the audit market. The 2003 report found large increases in the Herfindahl index for the audit industry after the two most recent mergers and the dissolution of Andersen. The report studies the time period between 1988 and 2002 (we use the years before and after the events). The 2003 report used data from *Who Audits America*. The metrics included in the GAO reports are not used consistently throughout the study. For example, the trends in concentration using the Herfindahl index are based only on client revenues and are calculated for the overall market. A brief analysis of the Herfindahl index based on client size is presented, but only for 2002. Market shares and four firm concentration ratios are reported, but only for each of the three years (1988, 1997 and 2002).

The 2008 GAO report uses a different sample and a somewhat different perspective but reaches the same basic conclusions regarding concentration and competition in market for audits of public companies. The results from GAO 2008 apply to 2002-2006. The report used data from *Audit Analytics*, a database that covers U.S. and foreign firms trading their shares in the U.S., however the report is unclear as to the inclusion or exclusion of foreign firms. The concentration measures are based solely on client revenues. It is worth noting that although

both reports found increases after the two events in our study and a pattern of increasing concentration over time, both concluded that no government action was needed at this time.

There are two other issues of interest covered in prior research. The first issue is that concentration seems to decrease somewhat after the initial increase due to a merger (Wootton et al. 1994; GAO 2003, 2008). The other issue is that there is evidence that mergers among the large audit firms often do not result in increased market shares or growth rates for the merged firms, especially when only large clients and large audit firms are considered (Wootton et al. 1994; Wolk et al. 2001). This suggests that a more balanced audit market among the largest audit firms could actually increase the level of competition.

Prior research found that concentration in the audit industry has been increasing over time with sharp increases after consolidating events such as mergers. Most prior research has emphasized the largest audit firms and U.S. client firms. We first examine the effects of the two consolidating events on competitiveness of the whole sample. The first research question is:

RQ1: Did competitiveness in the overall audit market significantly change after the two most recent consolidating events?

Based on prior research, we expect the concentration to increase leading to a decrease in the level of competitiveness after each event.

Competitiveness within the Top Three Tiers of Audit Firms

In the late 1970s and early 1980s, several second-tier firms tried to increase market share through mergers but most of those attempts were unsuccessful (Wootton et al., 2003). Geographic coverage, particularly outside of the U.S., was a major motivation for mergers and acquisitions. Of the five firms we classify as second-tier, two were the result of mergers and acquisitions after this time. Grant Thornton became the ninth largest public accounting firm after mergers in 1980 and 1985. In 1999, McGladrey & Pullen became a subsidiary of H&R Block, Inc. One of the second-tier firms, Moore Stephens, originated in the United Kingdom. Pannell Kerr Forster (now known as PKF) was created in 1969 from four firms in Australia, Canada, the U.K. and the U.S.

There were several mergers and acquisitions among the firms we classify as third-tier during the years of our study. In view of the history of the development of the first-tier firms, it is possible that another “Big” firm will emerge partially as a response to the opportunities presented by the consolidating events. However, the two most recent consolidating events offered opportunities immediately for some of the smaller audit firms, particularly the

second-tier firms, to increase market share. Most prior research has focused on the first-tier audit firms. One study that did examine second-tier audit firms separately was Wootton et al. (1994) and they found that the differences between the market shares of the first-tier and second-tier audit firms were greater after the 1989 mergers. The 2008 GAO report also includes separate analysis of the smaller audit firms. The second-tier audit firms are classified based on number of clients, while our approach based on geographic location is consistent with prior research. The 2008 report found that market shares decreased for the largest firms and slightly increased for the midsize and smaller firms from 2002 to 2006.

Assuming that the firms in each tier compete for many of the same clients, we examine the top three tiers separately. We compare concentration before and after the two consolidating events and search for other evidence that second-tier and third-tier firms benefitted from the consolidating events. The second research question is:

RQ2: Did competitiveness in the three tiers of audit firms significantly change after the two most recent consolidating events?

Due to a lack of prior research related to this question, we did not have expectations about the concentration measures. However, we did expect to find some increases in market shares for the second-tier and third-tier firms.

Competition for Different Sized Client Firms

Prior research has shown that the largest audit firms dominate the market for audits of the largest client firms. The largest audit firms have the resources such as personnel and geographical coverage necessary to perform audits of large companies. The 2003 GAO report found that the Big Four audited 78% of all public companies and 99% of all revenues of public companies. The 2008 GAO report examined differently sized companies separately and found that the market for audits of companies with revenues greater than \$1 billion was highly concentrated in 2006 but decreased as the size of the client companies decreased. The concentration level for audits of companies with revenues less than \$100 million was classified as “Unconcentrated” (a Herfindahl index of less than 0.1000).

We segment the client firms into quartiles according to their revenues and examine the concentration levels in the quartiles separately before and after the consolidating events. Thus the third research question is

RQ3: Did competitiveness among the auditors of the smaller client firms significantly change after the two most recent consolidating events?

We did expect to find some evidence that there was more competition for smaller client firms.

METHODOLOGY

Sample

We gathered data for all available publicly held companies in the *Compustat Research Insight* and *Global Vantage* databases for the years 1997 and 1999 (the years before and after the merger of Price Waterhouse and Coopers & Lybrand) and the years 2001 and 2003 (the years before and after the dissolution of Arthur Andersen). The data items needed were company name, primary SIC code, location, auditor, sales, and total assets. Originally there were 23,012 companies in 1997, 24,395 companies in 1999, 23,017 companies in 2001, and 20,105 companies in 2003. We deleted international firms that were listed in both databases with the same auditor. We also deleted 25 firms that had zero values for both sales and assets in all four of the years examined. We did not include any observations that had zero values for both sales and assets in any of the four years. We also did not include observations with an auditor coded as “Other” by *Compustat* after we manually checked all of those observations for the audit firm on the appropriate 10-K. The final sample is composed of 14,756 firms in 1997 (7,939 U.S. and 6,816 international), 15,340 firms in 1999 (7,685 U.S. and 7,653 international), 13,893 firms in 2001 (6,650 U.S. and 7,242 international), and 11,999 firms in 2003 (5,822 U.S. and 6,175 international).

We included U.S. firms in the *Compustat* database as well as foreign firms from the *Global Vantage* database.⁴ By including international firms, not only is the global reach of the largest U.S. public accounting firms reflected in our analysis, but the resulting sample is larger than that used in prior studies.⁵ We also added auditor codes for firms that are active in the audits of publicly held companies but are classified as “Other” in the *Compustat* database. Our definition of an active audit firm is an auditor with at least ten client firms in at least two years of the sample period.

Concentration Measures

We used two of the most common measures of concentration from industrial economics, the four-firm concentration ratio and the Herfindahl index. The metrics reflect important characteristics of the market structure such as the number of firms and their relative size. Both of these factors are important in competition as they can affect the coordination of prices as well as the leadership behavior of the firms in a market (Mueller and Hamm,

⁴ We repeated the analysis excluding foreign firms and our results are nearly the same.

⁵ The 2003 GAO report cites the February 2003 edition of the *Public Accounting Report* and information provided by foreign regulators that suggests that the market for audits of large companies tend to be as highly concentrated as in the U.S. For example, the Big 4 audited 80 per cent of all public companies in Japan and virtually all major companies in the United Kingdom.

1974, White 2002). The concentration ratios provide information about the relative distribution of market shares between the *largest* firms and the remaining firms indicating in this way the extent of market power and competitiveness of an industry. Concentration ratios are often used for their simplicity. The Herfindahl index is considered by many (e.g., Minyard and Tabor 1991) to be a better measure of concentration than concentration ratios. As shown in our discussion below, the metric is constructed with the market shares of *all* active firms within a market and is sensitive to both the number of active firms, but also to their relative size (their dispersion in terms of market shares) within an industry. We include the two metrics in our analysis as they have both been widely used in prior audit markets studies (Wootton et al. 1994; Wolk et al. 2001). A rule used by many economists is that a four-firm concentration ratio above 0.6000 is indicative of oligopoly (Brux and Cowen 2002). The Herfindahl index has been used by government agencies to assess post-merger competitiveness in an industry. The commonly used guidelines are that a Herfindahl index of less than 0.1000 in an industry indicates a relatively competitive market. An index of above 0.1800 indicates that the industry is highly concentrated and that there is potential for significant market power for the dominant companies in the industry.

Consistent with prior studies, we used market shares based on the number of client firms and based on the square root of client revenues, a proxy for audit fees. Although both, the number of clients and our proxy for audit fees will produce consistent trends in concentration, our proxy for audit fees will display higher values, highlighting the dominance of the Big Four audit firms in the market for audit services. Market shares (X) were calculated by dividing the number of firms (or the total square roots of client revenues) audited by a firm by the total number of firms (or total square roots of client revenues) audited by all active audit firms. Concentration ratios were calculated by adding the market shares of the top four firms (CR_4). Herfindahl indices (HI) were calculated as follows:

$$HI_x = \sum_{i=1}^n X_i^2$$

where X is the market share of the i^{th} audit firm and n is the number of active audit firms.⁶

⁶ In an earlier version of the paper the Herfindahl Index Base was calculated by dividing one by the number of active audit firms. The difference between Herfindahl Index and Herfindahl Index Base was calculated (Minyard and Tabor called this difference an adjustment). The difference represents the relative distance from a perfectly competitive market in which all active audit firms have exactly the same market shares. The assumption is that a market or market segment is competitive if the market shares of all participants are roughly equal. In such a market, power is not concentrated in one firm or small group of firms.

Empirical Analysis

We initially calculated our two concentration measures CR_i and HI for the overall audit market (RQ1). We then calculated separate concentration measures for each of the three tier audit groups (RQ2). The first-tier firms are the six largest international audit firms in 1997, which merged into the Big Five in 1998, and which later become the Big Four after Andersen's dissolution. Consistent with prior research (Francis and Simon 1987; Geiger and Rama 2006), the second-tier firms were defined as the national firms (based on office locations) as: BDO Seidman, Grant Thornton, McGladrey & Pullen, Moore Stephens and Pannell Kerr Forster.⁷ The third-tier firms are the regional firms and include all the remaining active audit firms identified in our study that did not fit our definition of second-tier auditors. We initially considered performing a difference in proportions statistical test to compare our concentration measures before and after the consolidation events, but our data did not comply with the assumptions of the test (Daniel 1990, 58).

RESULTS

Results for RQ1 Changes in the Competitiveness of the Overall Audit Market

The market shares of all active audit firms, based on the total number of client firms (Panel A) and the square root of client revenues (Panel B), appear in Table 1. The market shares are displayed for the individual audit firms, and for the audit firms classified according to their size in three-tier groups. The table also reports concentration measures for the overall sample and for the three tier groups separately. The differences in market shares based on the number of clients and on the square root of client revenues are more pronounced for first-tier audit firms. The totals for number of client firms and for square root of client revenues do not include those companies that have the auditor code "Other".⁸ However, the percentage of companies in the databases that list the auditor as "Other" has increased from 1997 to 2003.⁹

⁷ We searched the websites of the largest audit firms not included among the first-tier and verified the geographical location of their offices. The firms classified as second-tier had offices in most regions of the country whereas the third-tier group had offices concentrated in one or two regions.

⁸ This category includes companies (mostly international) that have not been assigned a specific auditor code in the *Compustat* or *Global Vantage* databases or that are not among the additional sixteen audit firms that we coded ourselves with information from approximately 2,500 SEC filings.

⁹ The percentage increased from 32.48 percent in 1997 to 36.24 percent in 2003. The percentages when measured by our proxy for audit fees, square root of client revenues, actually decreased from 31.42 percent in 1997 to 30.84 percent in 2003.

TABLE 1

**Audit Firm Market Shares and Concentration Measures
All U. S. and International Clients**

Panel A: Number of Client Firms				
Audit Firm	1997	1999	2001	2003
Arthur Andersen	16.30%	16.77%	14.80%	0.00%
Coopers & Lybrand	12.92%	NA	NA	NA
Ernst & Young	19.22%	19.65%	20.98%	26.82%
Deloitte & Touche	13.95%	14.07%	15.14%	19.91%
KPMG Peat Marwick	18.06%	17.75%	17.81%	19.43%
Price Waterhouse (Coopers)	<u>13.38%</u>	<u>24.99%</u>	<u>23.28%</u>	<u>24.88%</u>
SUBTOTAL-First-Tier Firms	13,845	14,302	12,784	10,923
Percentage of Total Client Firms	93.83%	93.23%	92.02%	91.03%
CR₄	0.7197	0.8491	0.8392	1.0000
HI	0.1706	0.2077	0.2064	0.2548
BDO Seidman	2.04%	2.11%	2.20%	2.41%
Grant Thornton	1.99%	2.20%	2.68%	2.93%
McGladrey & Pullen	0.35%	0.29%	0.31%	0.30%
Moore Stephens	0.30%	0.25%	0.32%	0.54%
Pannell Kerr Forster	<u>0.26%</u>	<u>0.30%</u>	<u>0.27%</u>	<u>0.24%</u>
SUBTOTAL-Second-Tier Firms	729	790	802	770
Percentage of Total Client Firms	4.94%	5.15%	5.77%	6.42%
CR₄	0.9465	0.9506	0.9539	0.9623
HI	0.3436	0.3592	0.3690	0.3594
Crowe Chizek	0.03%	0.03%	0.07%	0.08%
J H Cohn	0.04%	0.07%	0.06%	0.16%
Moss Adams	0.07%	0.10%	0.15%	0.10%
Richard A. Eisner	0.26%	0.28%	0.24%	0.29%
Feldman, Sherb & Co.	0.09%	0.10%	0.17%	NA
Ehrhardt Keefe Steiner & Hottman	0.09%	0.11%	0.12%	0.16%
Goldstein Golub Kessler	0.08%	0.12%	0.15%	0.16%
Hansen, Barnett & Maxwell	0.01%	0.05%	0.07%	0.10%
Hein & Associates	0.23%	0.18%	0.19%	0.27%
HJ & Associates	0.03%	0.11%	0.14%	0.15%
Lazar Levine & Felix	0.05%	0.08%	0.08%	0.09%
Malone & Bailey	0.01%	0.02%	0.08%	0.16%
Rosenberg Rich Baker Berman & Co.	0.01%	0.03%	0.06%	0.08%
Singer Lewak Greenbaum & Goldstein	0.07%	0.08%	0.12%	0.14%
Stonefield Josephson Inc.	0.02%	0.05%	0.08%	0.13%
Tanner & Co.	0.07%	0.11%	0.13%	0.13%
Virchow, Krause & Company	0.01%	0.01%	0.09%	0.15%
Weinberg & Company	0.00%	0.02%	0.09%	0.07%
William & Webster, P.S.	0.00%	0.01%	0.05%	0.08%
Wiss & Company LLP	<u>0.05%</u>	<u>0.07%</u>	<u>0.06%</u>	<u>0.07%</u>
SUBTOTAL-Third-Tier Firms	182	248	307	306
Percentage of Total Client Firms	1.23%	1.62%	2.21%	2.55%
CR₄	0.5495	0.4234	0.3420	0.3431
HI	0.1126	0.0800	0.0602	0.0631
TOTAL (Number of Client Firms)	14,756	15,340	13,893	11,999
CR₄	0.6753	0.7917	0.7722	0.9103
HI	0.1510	0.1815	0.1760	0.2127

TABLE 1 (continued)

Panel B: Square Root of Client Revenues				
Audit Firm	1997	1999	2001	2003
Arthur Andersen	16.40%	17.10%	15.83%	0.00%
Coopers & Lybrand	15.11%	NA	NA	NA
Ernst & Young	18.14%	17.75%	19.24%	24.23%
Deloitte & Touche	14.40%	14.91%	16.38%	22.44%
KPMG Peat Marwick	18.57%	18.78%	17.97%	20.45%
Price Waterhouse (Coopers)	<u>15.05%</u>	<u>28.96%</u>	<u>27.63%</u>	<u>29.91%</u>
SUBTOTAL – First-Tier Firms	\$288,146,238	\$298,353,254	\$288,079,739	\$281,557,041
Percentage of Total Square Root of Client Revenues	97.67%	97.50%	97.05%	97.03%
CR_4	0.7197	0.8491	0.8392	1.0000
HI	0.1683	0.2126	0.2097	0.2553
BDO Seidman	0.91%	0.96%	1.27%	1.07%
Grant Thornton	0.90%	1.01%	1.14%	1.23%
McGladrey & Pullen	0.11%	0.09%	0.09%	0.07%
Moore Stephens	0.09%	0.07%	0.07%	0.17%
Pannell Kerr Forster	<u>0.11%</u>	<u>0.13%</u>	<u>0.06%</u>	<u>0.05%</u>
SUBTOTAL-Second-Tier Firms	\$6,260,132	\$6,896,840	\$7,784,540	\$7,546,395
Percentage of Total Square Root of Client Revenues	2.12%	2.25%	2.62%	2.60%
CR_4	0.9590	0.9709	0.9756	0.9800
HI	0.3720	0.3852	0.4228	0.4003
Crowe Chizek	0.02%	0.01%	0.03%	0.04%
J H Cohn	0.01%	0.01%	0.01%	0.01%
Moss Adams	0.02%	0.02%	0.03%	0.03%
Richard A. Eisner	0.05%	0.05%	0.05%	0.05%
Feldman, Sherb & Co.	0.02%	0.01%	0.02%	0.00%
Ehrhardt Keefe Steiner & Hottman	0.02%	0.01%	0.01%	0.02%
Goldstein Golub Kessler	0.01%	0.03%	0.03%	0.03%
Hansen, Barnett & Maxwell	0.00%	0.00%	0.01%	0.01%
Hein & Associates	0.03%	0.03%	0.03%	0.04%
HJ & Associates	0.00%	0.01%	0.01%	0.02%
Lazar Levine & Felix	0.01%	0.02%	0.02%	0.02%
Malone & Bailey	0.00%	0.00%	0.00%	0.01%
Rosenberg Rich Baker Berman & Co.	0.00%	0.00%	0.01%	0.01%
Singer Lewak Greenbaum & Goldstein	0.01%	0.01%	0.01%	0.02%
Stonefield Josephson Inc.	0.01%	0.01%	0.01%	0.02%
Tanner & Co.	0.01%	0.01%	0.02%	0.01%
Virchow, Krause & Company	0.00%	0.00%	0.01%	0.02%
Weinberg & Company	0.00%	0.00%	0.01%	0.01%
William & Webster, P.S.	0.00%	0.00%	0.00%	0.00%
Wiss & Company LLP	<u>0.00%</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.00%</u>
SUBTOTAL-Third-Tier Firms	\$613,083	\$752,182	958,067	\$1,065,566
Percentage of Total Square Root of Client Revenues	0.21%	0.25%	0.32%	0.37%
CR_4	0.5537	0.4947	0.4428	0.4309
HI	0.1142	0.0942	0.0781	0.0756
TOTAL	\$295,019,453	\$306,002,278	\$296,822,346	\$290,169,002
CR_4	0.6822	0.8259	0.8123	0.9703
HI	0.1607	0.2023	0.1978	0.2406

Market Shares (λ) = the number of client firms (or audit fees) audited by a firm during the fiscal year divided by the total number of client firms (or total audit fees) audited by all active audit firms in that fiscal year. Four-firm concentration ration (CR_4) = the sum of the market shares of the largest four active audit firms. Herfindahl Index (HI) = the sum of the square of the market shares of all active audit firms in a fiscal year. Variables were calculated before (1997) and after (1999) the consolidation of Price Waterhouse with Coopers & Lybrand and before (2001) and after (2003) the dissolution of Arthur Andersen. Firms and time subscripts have been omitted for convenience.

The four-firm (CR_4) concentration ratios and the Herfindahl indices (HI) for the entire sample appear for all years at the bottom of Table 1 (Panels A and B). CR_4 increased from 0.6753 (0.6822, measured by square root of client revenues) in 1997 to 0.9103 (0.9703 measured square root of client revenues) in 2003. A pattern emerges here that is seen throughout our study. CR_4 increased in 1999 after the merger of Coopers & Lybrand and Price Waterhouse in 1998. In 2001 CR_4 decreased somewhat. However, in 2003, after the demise of Andersen, CR_4 increased again. All of these concentration ratios are above the rule of thumb of 0.6000, indicating the oligopolistic nature of the audit market structure and the position of the Big audit firms as the market leaders.

HI shows a similar pattern. HI increased in 1999 (from 0.1510/0.1607) after the merger of Coopers & Lybrand and Price Waterhouse in 1998 and then decreased in 2001. However, in 2003, after the demise of Andersen, HI increased again (to 0.2127/0.2406). Most of the indices are greater than the 0.1800 guideline for highly concentrated markets. Another pattern consistently seen in our data is that the markets are more concentrated when market shares are calculated using the square root of client revenues as a proxy for audit fees. This provides additional evidence that the largest public accounting firms dominate the market for auditing the largest publicly held companies, thereby earning much higher audit fees.

Results for RQ2 Changes in the Competitiveness within the Three Tiers of Audit Firms

The market shares and concentration measures for the first-tier audit firms appear at the top of Table 1 (Panels A and B). The percentage of total client firms audited by the first-tier firms decreased (from 93.83 percent in 1997 to 91.03 percent in 2003). All of the percentages are higher than the 78 percent of all publicly listed firms given in the 2003 GAO report. When market shares are measured by the square root of client revenues (proxy for audit fees), the percentage audited by the first-tier firms shows a smaller decline (97.67 percent in 1997 and 97.03 percent in 2003).

The CR_4 for the first-tier firms examined separately increased in 1999 (from 0.7197/0.6985) after the merger of Coopers & Lybrand and Price Waterhouse in 1998. In 2001 CR_4 decreased. Then, in 2003, after the demise of Andersen, CR_4 increased again to 1.0000 as only four firms remain in the first-tier group. Note that this pattern is similar to the one reported for the full sample analysis and that all of the concentration ratios are above the 0.6000 rule. HI increased (from 0.1706/0.1683) in 1999 and then decreased in 2001. Finally, in 2003, HI increased (to 0.2548/0.2553) for both the number of clients and the square root of client revenues.

The results for the second-tier audit firms are less consistent with the above pattern. The market shares of the second-tier firms have increased consistently from 1997 (4.94/2.12 percent) to 2003 (6.42/2.60 percent). These results suggest that the second-tier firms may have benefitted from the consolidation events. The CR_t for the second-tier firms increased (from 0.9465/0.9590) in 1999. In 2001 CR_t increased and then, in 2003, CR_t increased again (to 0.9623/0.9800). The concentration of the market for the second-tier firms measured by the HI increased (from 0.3436/0.3720) in 1999. HI then shows an increase in 2001. However, in 2003 for this market segment, HI decreased (to 0.3594/0.4003). One somewhat surprising result from analyzing the three tiers of audit firms separately is that, in most instances, the level of concentration among the second-tier audit firms is higher than the concentration among the first-tier firms. That is primarily due to the second-tier market being dominated by BDO Seidman and Grant Thornton.

The market shares for the third-tier audit firms separately are reported in the second-half of Table 1 (Panels A and B). Similar to the second-tier firms, there has been a consistent increase in market shares from 1997 (1.23/0.21 percent) to 2003 (2.55/0.37 percent). The magnitude however is very small, especially when measured by our proxy for audit fees. For these firms CR_t declined (from 0.5495/0.5537) in 1999. Then in 2001 CR_t declined again. However, in 2003 the CR_t increased (to 0.3421/0.4309). The change in HI for this market segment during the sample period is consistent with the pattern in the concentration ratios. The HI decreased (from 0.1126/0.1142) in 1999 and decreased again in 2001. In 2003 the index increased to 0.0631 based on the number of clients, but decreased to 0.0756 based on the square root of clients revenues. Taken together, even with the increase in concentration in 2003 the market for the third-tier audit firms has become more competitive ($CR_t < 0.6000$ and $HI < 0.1800$) after the two major consolidation events. This result differs from the findings in the two largest audit market segments. Unlike prior research (Tonge and Wootton 1991), we do not find that the market shares of the first-tier firms became more equal in size during this period. We also do not find that the differences between the first-tier firms and others became greater as Wootton et al. (1994) did.

Results for RQ3 Changes in the Competitiveness for Different Sized Client Firms¹⁰

The market shares and concentration measures for the audit market segmented according to the size of the client firms appear in Table 2. The market was classified into four size quartiles based on client revenues which were calculated for each of the sample years (Panel A). Panel B reports the market shares and concentration measures based on number of clients. The market shares and concentration measures based on the square root of client revenues appear in Panel C.

The percentage of largest client firms (those with revenues in the top quartile) audited by the first-tier auditors declined very little after the consolidation events (from 98.92/99.03 percent in 1997 to 98.43/98.71 per cent in 2003). During the same period, the second-tier audit firms increased their market shares (from 1.06/0.96 percent to 1.53/1.27 percent). The third-tier firms are barely represented in this market segment. In this segment of the audit market, the concentration measures are highest than in any other segment. CR_t increased (from 0.6902/0.6871) in 1999. CR_t decreased in 2001 and increased substantially (to 0.9843/0.9871) in 2003. The trend of HI is consistent with this pattern. The HI increased (from 0.1645/0.1646) after the 1999 merger. It decreased in 2001 and increased again (to 0.2491/0.2516) in 2003. The increase in HI to a level above the 0.1800 guideline indicates a highly concentrated market for the number of client firms and for the square root of client revenues during the period of the sample. Maybe the smaller audit firms just do not have sufficient resources to perform audits on large clients but another possibility is that they are shut out of this market by the larger firms, perhaps because they do not enjoy the same reputation about the quality of their audit work as the large firms do.

¹⁰ An earlier version of the paper provided an analysis of the audit markets segregated by U.S. exchanges. The results revealed a pattern consistent with the one observed throughout our study. The New York Stock Exchange and "Other" exchange (which included leveraged buyouts and subsidiaries) became less competitive ($CR_t > 0.6000$ and $HI > 0.1800$) while the remaining exchanges remained fairly competitive after the two events.

TABLE 2

Audit Firm Market Shares and Concentration Measures
All U. S. and International Clients by Client Size

Panel A: Client Revenues Quartiles				
	1997	1999	2001	2003
First Quartile	\$529,715,500	\$519,560,000	\$584,468,000	\$797,920,000
Second Quartile	\$128,990,000	\$121,090,000	\$131,421,000	\$179,246,000
Third Quartile	\$32,450,500	\$26,908,000	\$29,104,000	\$38,428,000

Panel B: Number of Clients				
Client Revenues > First Quartile				
	1997	1999	2001	2003
First-Tier Firms	98.92%	98.64%	98.50%	98.43%
Second-Tier Firms	1.06%	1.36%	1.50%	1.53%
Third-Tier Firms	<u>0.03%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Total	3,689	3,835	3,473	2,999
<i>CR₄</i>	0.6902	0.8402	0.8218	0.9843
<i>HI</i>	0.1645	0.2076	0.2044	0.2491

Second Quartile < Client Revenues ≤ First Quartile				
	1997	1999	2001	2003
First-Tier Firms	97.02%	96.77%	96.40%	96.63%
Second-Tier Firms	2.87%	3.02%	3.31%	3.10%
Third-Tier Firms	<u>0.11%</u>	<u>0.21%</u>	<u>0.29%</u>	<u>0.27%</u>
Total	3,688	3,835	3,473	3,000
<i>CR₄</i>	0.6950	0.8190	0.8108	0.9663
<i>HI</i>	0.1604	0.1951	0.1917	0.2370

Third Quartile < Client Revenues ≤ Second Quartile				
	1997	1999	2001	2003
First-Tier Firms	94.15%	92.93%	92.28%	91.20%
Second-Tier Firms	5.26%	6.21%	6.45%	7.63%
Third-Tier Firms	<u>0.60%</u>	<u>0.86%</u>	<u>1.27%</u>	<u>1.17%</u>
Total	3,690	3,835	3,473	3,000
<i>CR₄</i>	0.6867	0.7817	0.7866	0.9120
<i>HI</i>	0.1535	0.1797	0.1779	0.2162

Client Revenues ≤ Third Quartile				
	1997	1999	2001	2003
First-Tier Firms	85.23%	84.59%	80.89%	77.87%
Second-Tier Firms	10.57%	10.01%	11.83%	13.40%
Third-Tier Firms	<u>4.20%</u>	<u>5.40%</u>	<u>7.28%</u>	<u>8.73%</u>
Total	3,689	3,835	3,474	3,000
<i>CR₄</i>	0.6370	0.7257	0.6917	0.7787
<i>HI</i>	0.1311	0.1524	0.1422	0.1697

TABLE 2 (continued)

Panel B: Square Root of Client Revenues				
Client Revenues > First Quartile				
	1997	1999	2001	2003
First-tier	99.03%	98.88%	98.46%	98.71%
Second-tier	0.96%	1.02%	1.54%	1.27%
Third-tier	0.01%	0.00%	0.00%	0.00%
Total	\$192,778,297,810	\$203,415,789,910	\$199,611,921,680	\$192,834,071,900
<i>CR₄</i>	0.6871	0.8384	0.8256	0.9871
<i>HI</i>	0.1646	0.2118	0.2067	0.2516
Second Quartile < Client Revenues ≤ First Quartile				
	1997	1999	2001	2003
First-tier	97.14%	96.92%	96.97%	96.96%
Second-tier	2.76%	2.89%	3.08%	2.81%
Third-tier	0.10%	0.19%	0.25%	0.23%
Total	\$59,888,923,990	\$61,461,051,356	\$58,380,767,934	\$58,596,655,181
<i>CR₄</i>	0.6948	0.8208	0.8113	0.9696
<i>HI</i>	0.1606	0.1963	0.1926	0.2388
Third Quartile < Client Revenues ≤ Second Quartile				
	1997	1999	2001	2003
First-tier	94.26%	93.27%	92.64%	91.42%
Second-tier	5.17%	5.96%	6.22%	7.42%
Third-tier	0.58%	0.77%	1.15%	1.16%
Total	\$30,581,561,681	\$30,081,472,412	\$28,381,311,590	\$28,329,162,838
<i>CR₄</i>	0.6852	0.7842	0.7881	0.9142
<i>HI</i>	0.1533	0.1807	0.1787	0.2168
Client Revenues ≤ Third Quartile				
	1997	1999	2001	2003
First-tier	86.96%	86.79%	84.42%	81.58%
Second-tier	10.07%	9.56%	10.93%	12.94%
Third-tier	2.97%	3.65%	4.65%	5.48%
Total	\$11,770,669,765	\$11,043,964,824	\$10,448,344,540	\$10,409,112,224
<i>CR₄</i>	0.6518	0.7383	0.7202	0.8158
<i>HI</i>	0.1351	0.1588	0.1532	0.1849

Market Shares (λ) = the number of client firms (or the total square root of client revenues) audited by a firm during the fiscal year divided by the total number of firms (or total square root of client revenues) audited by all active audit firms in that fiscal year. Four-firm concentration ratio (CR_4) = the sum of the market shares of the largest four active audit firms. Herfindahl Index (HI) = the sum of the square of the market shares of all active audit firms in a fiscal year. Variables were calculated before (1997) and after (1999) the consolidation of Price Waterhouse with Coopers & Lybrand and before (2001) and after (2003) the dissolution of Arthur Andersen. Firm and time subscripts have been omitted for convenience.

The results for the market segment of clients with revenues in the second quartile are reported next (Panels B and C of Table 2). The market shares of the first-tier firms in this market declined after the consolidation event (from 97.02/97.14 percent in 1997 to 96.77/96.92 percent in 1999). The second-tier audit firms were able to increase their small presence in this market after the merger (from 2.87/2.76 percent in 1997 to 3.02/2.89 percent in 1999) but experienced a decline in their market shares after Anderson's demise (from 3.31/3.08 percent in 2001 to 3.10/2.81 percent in 2003). The pattern of change for the third-tier firms is similar to that of the second-tier auditors although their market shares are still very small ranging from 0.11/0.10 percent in 1997 to 0.27/0.23 percent in 2003. The CR_t in this segment of the audit market increased (from 0.6950/0.6948) in 1999. CR_t decreased in 2001 and increased again (to 0.9663/0.9696) in 2003. Likewise, HI increased (from 0.1604/0.1533) in 1999. HI decreased in 2001 and increased (to 0.2370/0.2388) in 2003. Not surprisingly, in this segment too the largest audit firms dominate the market by auditing 96.63/96.96 percent of the client firms. HI increased above the 0.1800 guideline during the same period. The Big Four audit firms have a virtual monopoly in auditing the largest publicly traded client firms.

The results for the market segment with revenues in the third quartile show a small but consistent decline in the market shares of the first-tier audit firms (from 94.15/94.26 percent in 1997 to 91.20/91.42 in 2003). In contrast, the second-tier audit firms appear to have benefitted with gains in market shares from the two consolidation events. For example, the second-tier audit firms increased their market shares from 5.26/5.17 percent (in 1997) to 7.63/7.42 percent (in 2003). Although the third-tier audit firms increased their market shares after the consolidation event, (from 0.60/0.58 percent in 1997 to 0.86/0.77 percent in 1999) they experienced a decline (or little change based on client revenues) after the 2003 demise (from 1.27/1.15 percent in 2001 to 1.17/1.16 percent in 2003). In this market segment CR_t increased from 1997 (0.6867/0.6852) to 2003 (0.9120/0.9142). The changes observed in the HI are similar in that the index increased (from 0.1535/0.1533) after 1999. They differ from CR_t by showing a decrease in 2001. In 2003 the HI increased again (to 0.2162/0.2168).

The results for the smallest client segment, those having revenues smaller than the lower quartile are displayed at the bottom of Table 2 (Panels B and C). Note that the market shares of the first-tier firms are smallest in this segment while the second- and third-tier firms are better represented. The decreasing trend in market shares of the first-tier audit firms (from 85.23/86.96 percent in 1997 to 77.87/81.58 percent in 2003) is consistent but sharper than the one reported in the previous paragraph. It appears that the largest auditors did not benefit from the

two consolidation events in this segment of the market. The second-tier audit firms did not make any gains in market shares after the consolidation event (from 10.57/ 10.07 percent in 1997 to 10.01/9.56 percent in 1999). However, they were able to increase their market shares after the 2003 demise (from 11.83/10.93 percent in 1999 to 13.40/12.94 percent in 2003). The third-tier audit firms display their strongest presence in this segment of the audit market. Their market shares increased steadily after the two consolidation events (from 4.20/2.97 percent in 1997 to 8.73/5.48 percent in 2003). In terms of concentration, this market segment is the least concentrated, but still displays concentration ratios consistent with an oligopoly (higher than 0.6000). The CR_4 increased (from 0.6370/0.6518) in 1999. By 2001 CR_4 declined, but it increased again (to 0.7787/0.8158) in 2003. Even though the concentration ratios are indicative of less competitiveness the HI reports a relatively competitive market segment (below 0.1800) during the sample years. HI increased (from 0.1311/0.1351) in 1999, decreased in 2001 and increased again in 2003 (to 0.1697/0.1849).

The results reported in this section suggest the possibility that the second- and third-tier firms might be making inroads into the smaller client segment of the audit market. Our examination of the market shares of the three auditor groups within each size category reveals a decreasing trend in the market shares of the first-tier firms and an increasing trend in the market shares of the second and third-tier groups. However, the analysis of the composition of the top four market leaders even in the smallest client segment indicates that the first-tier auditors are still the dominant firms.¹¹

CONCLUDING REMARKS

For decades, many have expressed concern about the large public accounting firms dominating the market for auditing publicly held companies. Between 1997 and 2003, two events resulted in the Big Six becoming the Big Four audit firms. We examined the changes in the competitiveness of the audit market after the two events and provide evidence that, in very few markets, there is some degree of competitiveness among the remaining active public accounting firms.

Based on prior research, we expected the level of concentration to increase after both events. We expected that when the market for audits of publicly held companies is segmented into the auditor size and client size,

¹¹ The analysis reported in RQ3 was repeated using the definition for client size from GAO 2008. The report defined as the largest clients those included in the 2006 Fortune 500 list (revenues higher than \$1 billion). Although the magnitudes of the market shares differ, the trends (unreported) are consistent with those reported in Table 2.

concentration levels would vary across the different segments. We wondered if the market shares for the non-first-tier audit firms would increase especially after the dissolution of Arthur Andersen. Our results support the expectation that the levels of concentration for the overall audit market increased after the merger of Price Waterhouse and Coopers & Lybrand and after the dissolution of Andersen. The levels of concentration decreased somewhat two years after the merger between Price Waterhouse and Coopers & Lybrand in 1998. It is possible that concentration levels will decrease again after 2003. However, the implementation of Sarbanes-Oxley Act could very well have a significant impact on competitiveness in the audit market.

When the audit market was segmented by auditor size, concentration levels increased after the two events, although not uniformly for all segments. Concentration increased for the first and second-tier audit firms, but decreased for the third-tier firms. One surprising result we found is that the levels of concentration among the second-tier firms were generally higher than those for the first-tier firms, with Grant Thornton and BDO Seidman dominating the competition.

Finally, when the market was disaggregated by client size, concentration levels increased for all market segments after the two events. However, the level of concentration remained at moderate levels for the smallest client segment of the audit market. While these results suggest that the market for audits of the small client segment appears more competitive, there was really little indication that the smaller audit firms significantly improved their market leadership during this period. Taken together, our results are consistent with prior research in that the four remaining large audit firms still dominate the overall market for audits of publicly held companies, especially the audits of large companies. Besides, the measures of concentration we use indicate a moderate to high level of audit firm concentration in most market segments examined. As was noted before, this may have changed since 2003, especially due to the demands of complying with Sarbanes-Oxley.

Limitations to this study include using market shares based only on audits of publicly held firms and not taking into consideration other changes that occurred in the client firm base (for example, mergers of client firms), the audit industry (for example, divestiture of the consulting services by the public accounting firms), and government regulation. Additionally, this study is primarily descriptive in nature and does not address whether the increase in concentration levels is harmful and, if so, in what ways. For example, future research could examine the impact of increased concentration on audit fees, audit quality or auditor reputation. Despite these limitations, we believe that a contribution of our study is that our sample of audited firms is larger than previous studies, as is the

number of audit firms we include in our analysis. But the major contribution of our study is that it includes the perspective that contracting with an audit firm occurs at different levels and that many factors are considered in the selection. Other papers have measured concentration at the national level and have not analyzed the changes in the competitiveness of the audit market from the perspectives of the different market segments presented in our study.

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**Twenty Code-Based Reasons Why the Tax Law Applicable to S Corporations Should Be Taught In
Corporate Tax Courses Rather Than In Partnership Tax Courses**

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Twenty Code-Based Reasons Why the Tax Law Applicable to S Corporations Should Be Taught In Corporate Tax Courses Rather Than In Partnership Tax Courses

Partnerships and S corporations are both “pass-through” entities for federal income tax purposes. As such, some instructors and students find it appropriate to teach and learn Subchapter S of the Internal Revenue Code in conjunction with Subchapter K. Subchapter S differs from Subchapter K in a significant number of important ways, however. In fact, when Subchapter S does not address an issue, Subchapter C applies and not Subchapter K. Given the differences between Subchapter K and Subchapter S, this article sets forth 20 reasons why the tax law governing S corporations is more appropriately discussed in a corporate tax course rather than in a partnership tax course.

S corporations are interesting statutory creatures. Subchapter S allows taxpayers to operate a business without having to wrestle with the general unfriendliness and ‘double-tax’ nature of Subchapter C, but taxpayers can still benefit from the corporate form of doing business. S corporations are “flow-through” entities and, as such, are not generally taxed at the corporate level, but rather only at the shareholder level. This flow-through feature provided by Subchapter S is similar to that of Subchapter K, which governs the tax treatment of partnerships and partners.

Universities that offer graduate tax and accounting programs typically have a course covering the tax treatment of partnerships (including limited liability companies treated as partnerships for income tax purposes) and a separate course covering the tax treatment of corporations. The law regarding S corporations, however, is typically not taught in a separate, stand-alone course, but rather as part of either the course on partnerships or the course on corporations.

Notwithstanding the similarities that Subchapter S has with Subchapter K, Subchapter S should be taught in conjunction with Subchapter C rather than Subchapter K in graduate level tax courses. This article presents 20 reasons why.

Reason #1. When Subchapter S Is Silent, Subchapter C Applies

Subchapter S is relatively short and concise, at least by Internal Revenue Code standards. But what happens if Subchapter S is silent on a particular issue? Does Subchapter K apply? Does Subchapter C apply? Code Section 1371(a) directly answers this question:

Except as otherwise provided in this title, and except to the extent inconsistent with this subchapter, *subchapter C* shall apply to an S corporation and its shareholders.

Thus, as will be illustrated throughout this article, the statutory scheme of Subchapter C (and *not* Subchapter K) controls in many critical situations where Subchapter S provides no law regarding the treatment of a particular transaction involving an S corporation.

Reason #2. An S Corporation Is, In Most Cases, a Corporation (and Not a Partnership or LLC) for State Business Law Purposes

A graduate student studying taxation should have at least a basic knowledge of business law concepts. Fortunately, most graduate tax students were required to take a business law course in their undergraduate programs. In order to provide future clients with valuable advice, tax students must be familiar with how a corporation is created and how it operates from a non-tax standpoint. At a minimum, students should be aware of the process of filing articles of incorporation with the appropriate state agency, the role of corporate bylaws, and the relative rights, privileges and obligations of the shareholders, board of directors, and officers. The appropriate course to review these legal principles with students and discuss

the attendant tax consequences is in a *corporate* tax class and not in a partnership tax class. After all, the applicable corporate law under state statutes is largely the same – if not identical – for both S corporations and C corporations. The “S” designation is merely a creature of *federal tax law*. Admittedly, with the advent of the check-the-box regulations, partners in a state law partnership or members of a state law LLC can elect to have the entity treated as an S corporation for federal income tax purposes. Notwithstanding the increasing numbers of partnerships and LLCs electing S status, a student is at a disadvantage if the student is unaware of basic corporate law while studying Subchapter S.

Reason #3. Section 351 Applies to the Transfer of Property to S Corporations

Subchapter S is silent regarding the tax consequences of transferring property to a corporation as a capital contribution either upon formation of the corporation or years later. This means the requirements of Section 351—which is in Subchapter C—must be met in order for the transferor(s) to avoid gain or loss recognition on the transfer of property to an S corporation. Specifically, Section 351(a) states:

No gain or loss shall be recognized if property is transferred to a corporation by one or more persons solely in exchange for stock in such corporation and immediately after the exchange such person or persons are in control (as defined in section 368(c)) of the corporation.

Contrast this with Section 721(a), which applies to the transfer of property to a partnership:

No gain or loss shall be recognized to a partnership or to any of its partners in the case of a contribution of property to the partnership in exchange for an interest in the partnership.

The major difference between Section 351(a) and Section 721(a) is the “control” requirement contained in Section 351(a). The significant impact of this requirement should not be overlooked. The Section 351 nonrecognition provision is much more restrictive than the Section 721 nonrecognition provision. The importance of the Section 351/721 distinction is even more apparent in some situations where the property transferred is subject to liabilities. How is a student learning Subchapter S in a partnership course going to understand or appreciate the intricacies of Section 351 if the student has only studied Section 721 as it applies to the transfer of property to a *partnership (or LLC)*?

Reason #4. No “Profits-Only” Interest Is Available for a Transferor of Services to an S Corporation

Neither Section 351 nor Section 721 governs the transfer of *services* to the corporation or partnership in return for an ownership interest. Those sections only allow the nonrecognition of gain or loss on the transfer of *property* to the corporation or partnership. Under general principles set forth by Section 83, the receipt of unrestricted stock in return for services provided to a corporation is a taxable event and the service provider has ordinary income to the extent of the fair market value of the stock received. Although the same principles generally apply to the receipt of a partnership interest in return for services provided, it is possible for a partner to receive an interest in partnership *profits* while receiving no interest in the partnership’s *capital*. In this situation, the IRS has ruled that the service provider does not recognize income on the receipt of the profits interest unless (1) the profits interest relates to a substantially certain and predictable stream of income from partnership assets; (2) the partner disposes of the profits interest within two years of receipt; or (3) the profits interest is a limited partnership interest in a publicly traded partnership.

Since the income tax treatment of receiving stock in an S corporation in return for services is the same as receiving stock in a C corporation in return for services, such a discussion belongs in a corporate tax course rather than mixed in with the tax treatment of receiving a partnership interest in return for services.

Reason #5. No Special Allocations Allowed for S Corporation Shareholders

One of the major restrictions placed on S corporations is that the shareholders cannot make special allocations of items of income, gain, loss, etc. Rather, all allocations must be pro-rata on a per-day, per-share basis. The driving force behind this restriction is Section 1361(b)(1)(D), which provides that an S corporation can have only one class of stock. Any special, non pro-rata allocation to a shareholder is viewed as indirectly creating a second class of stock that causes the S election to terminate immediately.

Subchapter K, in contrast, allows for considerable flexibility when allocating items of income, gain, loss, etc., among partners. Such allocations are generally allowed to the extent that the allocations have substantial economic effect under Section 704(b).

Reason #6. Treatment of Distributions of Property

Subchapter S is largely silent regarding the tax treatment of distributions of property from an S corporation to shareholders. Consequently, Section 311 generally applies and causes the corporation to recognize gain on the distribution of appreciated property to a shareholder. The corporation does not recognize loss, however, on the distribution of property that has a fair market value less than the property's tax basis. The shareholder has a tax basis equal to the *fair market value* of the property received, and has a new holding period in the property. In contrast, a partnership does not recognize gain on the distribution of appreciated property, the partner's tax basis in the property received is generally a *carryover basis*, and the partner's holding period in the property continues on (or "tacks").

Another major difference between S corporations and partnerships relating to distributions is if the S corporation has a C corporation history. If an S corporation has earnings and profits from years in which the S corporation was a C corporation, an accumulated adjustments account (AAA) must be maintained if the corporation still has earnings and profits from those years. No such account is required by Subchapter K.

Reason #7. Entity Level Taxes for S Corporations

Subchapter S imposes three entity-level taxes on an S corporation. First, Section 1374 imposes a tax on corporation attempting to avoid entity-level tax by making an S election for a C corporation immediately before the corporation sells or distributes property that has appreciated in value. Second, Section 1375 imposes the net passive investment income tax, which applies to an S corporation that has earnings and profits from C corporation years and has passive investment income exceeding 25% of its gross receipts. Third, Section 1363(d)(3) requires an S corporation to include a certain "LIFO recapture amount" in gross income upon the switch of inventory methods from FIFO to LIFO. Subchapter K imposes no such entity level income taxes on a partnership.

Reason #8. Entity-Level Liabilities Are Not Included in an S Corporation Shareholder's Tax Basis

An S corporation shareholder adjusts his or her stock basis for items of income and loss that the S corporation recognizes. This is similar to basis adjustments for partners of partnerships. An important difference exists between Subchapter S and Subchapter K, however. Section 752(a) treats a partner's increase in the partner's "share" of partnership liabilities as a contribution of money to the partnership. Similarly, Section 752(b) treats a partner's decrease in the partner's share of partnership liabilities as a distribution of money from the partnership. A partner's outside basis is adjusted according to shifts in a partner's share of entity-level liabilities. This basis adjustment due to liability balances at the entity level *does not* occur for S corporation shareholders.

Reason #9. S Corporation Shareholders Can Be Treated as Employees for FICA Purposes

Individual general partners of partnerships are treated as self-employed for payroll tax purposes. Consequently, the self-employment tax regime (SETA) applies to them. In contrast, S corporation shareholders that are also employees of the S corporation are treated under the FICA system. As a result, S corporation shareholders can receive a reasonable salary for their services and that salary is subject to

FICA. This allows for an opportunity to save on payroll taxes by lowering the salary paid (as long as the salary paid is still “reasonable”) and classifying remaining profits of the S corporation received by the shareholder as “distributions,” which are not subject to FICA or SETA.

Reason #10. The “Hot” Asset Provisions Applicable to Partnerships

If a partnership has unrealized receivables and/or inventory on the books and the fair market value is greater than the tax basis of those items, then the partnership has what is known as Section 751 assets (or “hot” assets). The presence of these assets can cause a partner to recognize ordinary income on the sale of his or her partnership interest to the extent of the selling partner’s share of the ordinary income that would have been realized by the hypothetical sale of the hot assets. Similarly, ordinary income can be recognized on distributions from the partnership due to the “hot” asset provisions in Subchapter K. Subchapter S has no such “hot” asset equivalent, thus allowing the sale of S corporation stock to be capital gain/loss notwithstanding the presence of ordinary-income producing assets on the S corporation’s books.

Reason #11. Mergers and Acquisitions

Subchapter C’s provisions applicable to mergers and acquisitions also apply to S corporations. Although in many cases the corporation’s “S” status may be lost due to a resulting ineligible shareholder, the corporation can still be involved in the reorganization without disqualifying the transaction from the provisions of Section 368. Conversely, the merger/division/reorganization of partnerships is governed by Section 708, which provides for an entirely different methodology for analyzing merger and division transactions. Consequently, the appropriate place to discuss an S corporation’s involvement in reorganizations is in conjunction with a discussion of C corporation reorganizations.

Reason #12. Different Partnership and S Corporation Return Due Dates

A partnership must file its Form 1065 by April 15 (for calendar year partnerships). An S corporation must file its Form 1120S by March 15 (for calendar year S corporations). The S corporation return filing due date is the same as for C corporations. Moreover, the title of the applicable form illustrates the difference between the partnership return and the S corporation return. The Form 1065 is titled “U.S. Return of Partnership Income.” The Form 1120S is titled “U.S. Income Tax Return for an S Corporation.” The word “tax” is contained in the S corporation return title and not in the partnership return title, thus illustrating the potential for entity-level taxes for S corporations.

Reason #13 Section 704(c) Pre-contribution Gain Allocations

Another related allocation issue is the pre-contribution gain and loss provisions found in Subchapter K, but not in Subchapter S. In particular, Section 704(c) provides that if a partner contributes property with a pre-contribution gain or loss (*i.e.*, the fair market value of the property is greater than or less than the property’s tax basis), that gain or loss is allocated solely to the contributing partner when the partnership later sells the property. This prevents pre-existing gain from being allocated to a partner or partners who did not share in the appreciation of the asset prior to the transfer of the property to the partnership. Section 704(c) gain or loss issues also cause some complexity in the regulations relating to how to handle various situations such as when the partnership recognizes a book loss but a tax gain on the sale of pre-contribution gain property. Subchapter S has no Section 704(c) equivalent. This is yet another reason why an approach of teaching the tax law applicable to S corporations in a partnership tax course may cause the student to have a lack of understanding of the significant differences between the two subchapters.

Reason #14 The Partnership Disguised Sale Provisions

Assume that Partner M contributes property to a partnership and Partner N contributes cash to a partnership. The next day the partnership distributes to Partner N the property that Partner M contributed and the partnership distributes to Partner M the cash contributed by Partner N. Subchapter K will treat this transaction as a “disguised sale” in accordance with Section 707(a)(2)(B). In substance, Partner M sold his

property to Partner N. Subchapter S does not contain a “disguised sale” equivalent. Rather, the contributions and related distributions will be governed by the Subchapter C regime to the extent any other Subchapter S provisions do not apply.

Reason #15 Differences in the Application of Section 108 Exclusions

If an entity is insolvent or in bankruptcy and the entity’s debts are forgiven, Section 108 may provide exclusion of certain amounts of gross income due to cancellation of indebtedness income. The tax treatment differs, however, depending on whether the entity is an S corporation or a partnership. For example, in determining the application of the cancellation of indebtedness rules, Section 108(d)(6) indicates that the bankruptcy/insolvency test is applied at the *partner* level. In contrast, Section 108(d)(7) indicates that in the S corporation context the bankruptcy/insolvency test is applied at the *entity* level.

Reason #16 A Partnership Is Subject to Technical Terminations

When 50% or more of the capital and profits of a partnership is sold or exchanged during a 12-month period, a partnership is deemed to terminate for federal income tax purposes. This could cause short-year filing obligations and new entity-level elections (such as accounting methods, Section 754 elections, etc.). The old partnership is deemed terminated and a new partnership is deemed formed. No such technical termination provisions apply to S corporations.

Reason #17 The Availability of Optional Basis Adjustments

If a partner sells her partnership interest and her tax basis in the interest (*i.e.*, “outside basis”) is different than her indirect share of the partnership’s tax bases in its assets (*i.e.*, “inside basis”), then the partnership may elect to adjust the tax bases of its assets in accordance with Section 743(b) and Section 754. In general, the adjustment is intended to provide the new partner an indirect tax basis in the partnership’s assets equal to the amount the new partner paid for the partnership interest (although the actual application of Section 754 is much more complex than the general explanation here). Basis adjustments to the partnership’s assets can also occur as a result of distributions to partners in accordance with Section 734(b). These optional basis adjustments are meant to preserve the underlying aggregate theory of taxation that applies to the treatment of partnerships. Subchapter S provides no similar provision to allow the S corporation to adjust the basis of its assets upon the sale of stock by a shareholder.

Reason #18 Restrictions on Gifts of Partnership Interests

Partners and shareholders often give a portion of their ownership interest away to family members. For example, the donor may make a gift for income-splitting purposes or estate planning purposes. Subchapter K places some restrictions regarding when a donee will be recognized as a bona fide partner in a partnership. In short, Section 704(e) requires that in order for the donee to be recognized as a partner the donee must own a capital interest in a partnership in which capital is a material income producing factor. Subchapter S does not contain similar provisions for donees of S corporation stock.

Reason #19 Partnership Audit Procedures

Partnerships are subject to special audit procedures contained in Section 6221 through Section 6234. Of importance in these procedures, for example, is the partnership’s appointment of a “tax matters partner.” Such partner is the partner that deals with the IRS under the unified audit procedures. Although S corporations are also pass-through entities, these detailed provisions of the Code do not specifically apply to S corporations.

Reason #20 Availability of Section 1244 to S Corporation Shareholders

The sale of stock in a corporation generally results in a capital gain or loss to the seller. Section 741 provides that the sale of a partnership interest is treated as the sale of a capital asset (except if the “hot” asset provisions of Section 751 apply) also. Section 1244, however, allows the seller of “Section 1244

stock” to recognize an ordinary loss—up to \$50,000 for individuals and \$100,000 for those married filing jointly—instead of a capital loss. Section 1244 is a provision to encourage taxpayers to invest in small corporations. Of course, certain requirements have to be met before stock qualifies as Section 1244 stock, but the benefit of an ordinary loss on the sale of S corporation stock is not available to a partner who sells his or her partnership interest for a loss.

CONCLUSION

Subchapter S and Subchapter K are not as similar as one might expect. Students often view S corporations as being treated nearly identically to partnerships for income tax purposes. This is a misplaced approach to the law applicable to S corporations. Some may argue that the S corporation tax return is similar to a partnership return and the pass-through concept is the same, so it is easier for a student to learn about S corporations in a partnership class. As illustrated in this article, however, there are many significant differences between partnerships and S corporations. Importantly, Subchapter C and *not* Subchapter K applies to S corporations when Subchapter S does not address an issue. Major issues such as property transfers to an S corporation and S corporation liquidations are governed by Subchapter C. Students may lose sight of these important issues due to the misplaced focus on how S corporations and partnerships are similar. Consequently, the tax law applicable to S corporations is best taught as part of a corporate tax course rather than a partnership tax course.

REFERENCES

Internal Revenue Code Section 83. All references are to the Internal Revenue Code of 1986, as amended.

IRC Section 108

IRC Section 311

IRC Section 351

IRC Section 368

IRC Section 704

IRC Section 707

IRC Section 708

IRC Section 721

IRC Section 734

IRC Section 741

IRC Section 743

IRC Section 751

IRC Section 752

IRC Section 754

IRC Section 1244

IRC Section 1361

IRC Section 1363

IRC Section 1371

IRC Section 1374

IRC Section 1375

IRC Section 6221

Comparative Advantage and Resource Costing

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Comparative Advantage and Resource Costing

Abstract

I present a model of the interaction among comparative advantage, learning, pricing, and resource costing. Learning and pricing flexibility facilitate comparative advantage. Learning costs, including research and development, are considered sunk costs in the literature, yet these costs result in important resources for comparative advantage. I expand the literature on comparative advantage to include research and development, learning and resource costs and I expand the literature on resource costing to include the impact of pricing and learning on comparative advantage.

Keywords: Comparative advantage, learning, research and development, resource costing, pricing, product differentiation, commoditization

The resources of a company include all that it has [Barney (1991), Day and Wensley (1988), Hofer and Schendel (1978)]: for example, cash, securities, inventories, land, buildings, machinery, supply chain for materials and energy, workforce, administrative and management organizations, research organization, research results, intellectual property, marketing organization, and market positions. Some resources will appear on the balance sheet as assets, such as cash, materials, land, buildings, equipment, and purchased intellectual property. Other resources do not appear on the balance sheet: for example, workforce, supply chain, administrative organization, or research results.

Resources will have capabilities, which are configured (Lavie, 2006) into routines or protocols that result in products and services. The capabilities of resources will have a comparative advantage or disadvantage for the purpose of making desired products or services that generate revenues (Barney, 1991; Peteraf, 1993; Grant, 1991).

Comparative Advantage. Theories of comparative advantage (e.g., Hunt and Morgan, 1995) explain the heterogeneous demand and supply of products and the diversity of resources in

industries (e.g., Porter, 1980, 1991) and countries¹. Comparative advantage theories focus on maximizing the higher profits that come from disequilibrium and are in contrast to perfect competition theories prevalent in economics textbooks (typically, Gould and Lazear, 1989), which focus on equilibrium and nominal economic profit.² First, in comparative advantage theories, product features are actively changed to improve the functions of products, reliability of delivery and timeliness of service. As a result of new product and service opportunities as well as shifts in culture, customers are in a constant state of changing expectations. Markets do not reach equilibrium because of constant disruptions by companies. Second, companies reconfigure internal capabilities to strive for quality, efficiency, and timeliness of operations in order to survive. Third, resources lose their comparative advantage over time as resource suppliers embed new knowledge. For example, each new generation of commercial aircraft is more fuel efficient with new knowledge of aerodynamics and avionics embedded in the aircraft.

Learning and Research. The bulk of the publications on research and development (R&D) do not address the issue of comparative advantage. For example, Stiglitz (1987) argues that learning is a sunk cost as the research time cannot be recovered. Similarly, Martin (1993) argues that R&D creates the resource knowledge, which is often highly specific to a company, its products and operations—the learning cannot be sold. Tirole (1998) argues that sunk costs, such as learning, have little or no intrinsic value to other firms and often cannot be assigned to other projects in the company. Astebro (2004) examined learning costs associated with the adoption of a new technology in metalworking companies and found that the size of plants, as opposed to company size, best predicts adoption of computerized design and numerical controls. The

¹ Comparative advantage theory related to countries often focuses on an abundant supply of natural resources, such as agriculture, oil, minerals, and lumber or a supply of inexpensive manual labor or technologically trained workers. The advantage comes from abundance of inexpensive resources. See as examples, Dornbush, Fisher, and Samuelson, 1977; Matsuyama, 1992; Krugman and Obstfeld, 1994.

² For other counterpoints to the perfect competition view, see starting with Coase, 1952; Stigler, 1966; Demsetz, 1973; and Williamson, 1989. Similarly, economics textbooks do describe monopolies, duopolies, and other limited competition settings, but generally as less desirable in comparison to the dominant theory of perfect competition, which is viewed as desirable.

competition for learning in technology has been modeled by Kaplan *et al.* (2003), who conclude that higher margin companies will adopt new technology first. The literature of prospects versus incumbents and which survive has been fairly well developed (Christensen & Bower, 1966; Henderson & Clark, 1990; Tripsas, 1997). Czarnitzki and Kraft (2004) examined an innovation competition model with German companies and found that potential entrants into markets invest more in learning (and related R&D) than those following a strategy of holding market share. The learning required to operate, like other sunk costs, may be considered an effective barrier to entry of new competitors [Martin, 2002; Schmalensee, 2004]. In contrast, Hirschey and Weygandt (1985) do support the capitalization and expensing of R&D based on impact on operations and stock value.

There is a developed literature on the stock valuation of R&D activity (Jaffe, 1986; Chaney and Devinney, 1992; Hall, 1993; Lev and Souginannis, 1996; Clancy and Johnson, 1999; Eberhart, Maxwell, and Siddique, 2004; Oswald and Zarowin, 2007). In general, there are significant R&D effects on stock value for technology related industries, especially when patents are involved (Hall, Jaffe, and Trajtenberg, 2005). For example, Martin and Kensinger (1990) found that R&D announcements by high technology firms resulted in positive abnormal stock returns and similar announcements by low technology firms resulted in negative stock returns. Similarly, Cockburn and Griliches (1988) found that the relationship between R&D and stock value had an industry moderating effect. In contrast, Chan, Lakonishok, and Sougiannis (2001) found mixed results on R&D intensity with stronger results on stock volatility than on stock returns. From the R&D expenditure impact on stock value, it might be inferred that R&D results in competitive advantage for technology-based companies.

Resource Costs and Product Costs. There are different views as to whether and how the costs of technology and capacity should influence product costing and decisions. The traditional dichotomy is between including both fixed and variable production costs as part of product costs (termed "full costing") or that only variable costs should be included (termed "variable costing"). Brieley, Cowton and Drury (2001) present evidence that European companies use both methods for decision making with roughly half using full costing and half using variable costing at least part

of the time. Full product costs were commonly used in product pricing. There are different approaches to the definition of capacity [DeBruine and Sopariwalo, 1994; Dilton-Hill and Glad, 1994; McNair, 1994; Maguire and Heath, 1997]. Whether the capacity is normal production, budgeted production, practical production given the usual maintenance and downtime, or ideal production in perfect settings. The results generally support that budgeted production is the commonly used allocation base for assigning capacity costs to products. In a laboratory study, Buchheit (2004) found that increased reported fixed costs affected pricing decisions, specifically increased prices avoided reported losses.

Resources are primarily held by companies to provide capability to produce a mix of products or services.³ The activity load experienced will vary from high to low during each day, season, and stage of the business cycle. There are risks related to the capability of resources to perform. As time passes, there is also a risk that resources held will become obsolete because they cannot be adapted to new knowledge.

There is a difference, termed "idle" capacity, between the practical capacity of resources and the capacity budgeted and used. In the CAMI model (CAMI, 1996; Ansari, *et al.* 1997) the costs associated with idle capacities are non-value added costs to consumers and should not be charged to products. There is also the concept that the costs of idle capacity should not be commingled with other costs as this causes errors in performance evaluation, product decisions, evaluation of markets, and decisions on facilities. First, companies with too much capacity charged to products or services will have lower sales growth because their prices will be relatively high resulting in reluctance to enter markets or start new products. Second, companies with high unit costs for capacity will drop products that appear to have high costs or move them off shore to lower total production costs. Finally, the inclusion of idle capacity costs in product costs will hide these costs from management scrutiny and action.

³ Other reasons why a company might hold resources include: to speculate on future activities or value, to keep them away from competitors, or out of inertia.

The purpose of this paper is to study the interactions among comparative advantage, R&D, learning, resource costs, capacities, and pricing. This study extends the literature on comparative advantage to include the assessment of comparative demand with learning and resource and research costs. The literature on product costing is extended to include comparative advantage, pricing, and learning. This study sheds new light on the competitive position of companies using differentiation strategies and the impact of cost attribution on the viability of differentiation. Managers may apply the results of this study to reconsider pricing policies, product costing policies, product differentiation, and R&D budgets.

Revenues, Costs, and Comparative Advantage

As represented by equations (1) and (2), the total income before taxes is the sum of revenues for all products i with features j at time t less the sum of all variable costs of resources k for products i with features j at time t , less the sum of fixed costs across the k resources at t and less all other expenses and losses, including the disposal of resources.

(1) Income before tax = Total Revenues - Total Variable Costs – Total Fixed Costs – Other Expenses or Losses

(2) Income before taxes: $\pi_t = \sum_{ij} p_{ijt} * D_{ijt} - \sum_{ijk} c_{ijkt} * D_{ijt} - \sum_k (c_{00kt} * Q_{kt}) - \Psi_t$

Where, p_{ijt} is the price set for product i with features j at time t ,

D_{ijt} is the demand in units for product i with features j at time t ,

c_{ijkt} is the variable cost of resource k of producing an additional unit of product i with features j at time t ,

c_{00kt} is the fixed cost per unit of resource k when zero products or services are produced at time t ,

Q_{kt} is the quantity of resource k held at time t ,

Ψ_t are all other expenses and losses.

Substituting $\eta_{ijt} = (p_{ijt} - \sum_k c_{ijkt})$ into Equation (2) as the contribution margin results in equation (3).

$$(3) \text{ Income before taxes}^4: \pi_t = \sum_{ij} \eta_{ijt} * D_{ijt} - \sum_k (C_{00kt} \times Q_{kt}) - \Psi_t$$

Equation (4) reflects the basic demand resulting from product prices and expected features plus the comparative demand⁵, based on sensitivity to comparisons on price and the expected features of other companies, plus a share of random impacts on demand through time.

$$(4) \text{ Demand: } D_{ijt} = \alpha_{ijt}(p_{ijt}, {}^eF_{ijt}) + \beta_{ijt}(p'_{ijt}, {}^eF'_{ijt}) + v_{it}$$

Where p'_{ijt} is the comparative price advantage of product i with features j at time t ; ${}^eF_{ijt}$ is the expected set of features j that product i will demonstrate at time t ; ${}^eF'_{ijt}$ is the expected comparative advantage of feature package j of product i at time t . The α_{ijt} term is the direct demand as a result of prices and features and the β_{ijt} term is the sensitivity of demand to comparative price and product or service features. The random drift term in Equation (4), v_{it} , should be correlated with the general economic conditions. Customers will form the expectations on ${}^eF'_{ijt}$ based on observed features in the prior period and all other information sources, including for example the internet, *Consumer Reports*, personal experiences, and advertising the emphasizes the p'_{ijt} and ${}^eF'_{ijt}$. However, customers will have bounded rationality and limit their search for information based on personal capacities and the cost of information.

Companies seeking a differentiation strategy (Dickson and Ginter, 1987; Mosakowski, 1993; Porter, 1991) should change prices and features to keep $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$ positive enough to cover the costs of differentiation. New features require a new design coming from R&D and from

⁴ Substituting in the weighted average of the contribution margins, ${}^{wa}\eta_{ijt}$ and the desired profits at time t , ${}^d\pi_t$, and solving for required total unit volume, $\sum_{ij} {}^{Req}D_{ijt} = [\sum_k C_{00kt} Q_{kt} + \Psi_t + {}^d\pi_t] / {}^{wa}\eta_{ijt}$. Since the numerator in this formulation will be fixed with respect to volume, the required volume will hinge on the weighted average margins. As the mix of products and/or features change, the ${}^{wa}\eta_{ijt}$ will change and this will change the required total unit volume. This is a variation of the traditional required volume formula.

⁵ The total demand is dichotomized here for the purpose of illustrating demand sources and the impact of customer preferences. Comparative demand may drop to zero when there are no real differences among the product features of companies—the product becomes a commodity. Thus, comparative demand is the crucial factor in determining the success of management strategy—differentiation vs. commoditization.

experimentation with customer preferences. The new features will require that the capabilities of existing and, perhaps, new resources be configured into new protocols, which then must be learned. Old protocols must be unlearned.

A combination of higher prices with significant demand can result from new services which have distinctive differential features that include high quality. Based on comparative advantage theory, progress is made when companies are rewarded with high comparative demand from a new and imaginative ${}^eF'_{ijt}$ that are priced at an attractive p'_{ijt} relative to competing products. The high β_{ijt} will be enhanced by emphasis of the ${}^eF'_{ijt}$ in advertisements and promotional materials. For example, at introduction the I-Phone by Apple, Inc. was innovative in its features and as a result Apple and AT&T were rewarded with high comparative demand after a reduction in the initial asking price. Advertisements helped sensitize consumers to the differential features of the product. A positive differential demand, $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$, should be created for each time period as competitors, if they can, will copy or eclipse the prior period's features. Thus, the comparative demand for a time period relates to R&D costs expended previously for features that have comparative advantage. It is the nature of the comparative demand that defines the relative success of product differentiation and commoditization strategies.

In contrast, companies that apply a strategy of commoditization standardize their products and have high efficiency and good quality. If and when customers cease to sufficiently reward differentiation as a comparative advantage, then the commoditization strategies will dominate. Thus, in those industries for which the $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$ approaches zero, features of products will tend to become stable because there is minimal reward for new differential product features. In these industries, R&D does not result in significant features that customers want. A commoditization strategy seeks the reliability in delivery, manages the risks from variation of sales due to the economy, and manages the supply chain to achieve minimal cost. As an example, vehicle fuel appears to have a low $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$ as customers react primarily to price for a given octane. There are modest discernible differences among the ${}^eF'_{ijt}$ of motor fuel sold in developed countries. Many petroleum companies have sold their gas stations because there are low margins and instead have focused on finding efficient and effective sources of fuel supply.

The relative success of commoditization and differentiation strategies depends on the size of the comparative demand in relation to the applicable R&D costs in the following inequality:

$$(5) \quad \eta_{ijt} \times \beta_{ijt} (p'_{ijt}, {}^e F'_{ijt}) - \ell_{ijt} \times R\&D_{ijt} > 0,$$

where the cost of R&D applied to current sales will vary inversely on the expected years that the current R&D will result in sales. For example, consider hypothetical products A and B in Exhibit 1. The R&D costs for product A have increased and the comparative sales attributable to the research and margins are declining such that at time t the R&D is not worthwhile. Product B is declining, but the comparative sales from the R&D generate sufficient margins to cover the research costs. In order to assess the success of R&D, similar to Exhibit 1, the R&D costs must be traceable to products. In concept, when inequality (5) becomes negative, then product R&D should cease and the remaining R&D budget should be reduced and refocused on improved protocols.

Exhibit 1
Analysis of Product Margins from Comparative Demand
Attributable to R&D⁶

	Unit Sales (thousands)	% Attributable To Comparative Demand from R&D	$R\&D \beta_{jit}(p'_{jit}, eF'_{jit})$	Contribution Margin per unit η_{jit}	Differential Margin	Product Research Costs	Differential Margin After R&D Cost
Product A							
t-2	100,000	40%	40,000	\$30	\$1,200,000	\$200,000	\$1,000,000
t-1	80,000	30%	24,000	\$25	\$600,000	\$350,000	\$250,000
t	76,000	25%	19,000	\$22	\$418,000	\$500,000	(\$82,000)
Product B							
t-2	100,000	40%	40,000	\$30	\$1,200,000	\$200,000	\$1,000,000
t-1	90,000	35%	31,500	\$30	\$945,000	\$250,000	\$695,000
t	80,000	30%	24,000	\$35	\$840,000	\$300,000	\$540,000

⁶ This analysis assumes that the prior period's features have been copied by competitors and R&D has value for only the current period (i.e., $\epsilon_{jit}=1.0$ for each period).

Cost Based Pricing. As discussed previously, prices are often set as a function of full costs based on budgeted capacity. The prices, p_{ijt} , are a marketed up full cost per unit as in (6):

$$(6) \quad p_{ijt} = (1 + \text{MU}\%) \times [\sum_k C_{ijk} + (\sum_k C_{00k} \times Q_{kt}) / \text{BC}]$$

where MU% is the markup percentage and BC is the budgeted capacity in units⁷.

The prospect of differential demand based on the combination of differential prices and product features will be diminished by a cost-based pricing policy because the prices are less flexible. Under this policy, the p_{ijt} and the p'_{ijt} would be changed by either becoming more efficient on variable costs, by increasing the budgeted volume, or by changing the predetermined markup rate. Thus, cost-based pricing will play a role in dampening the responsiveness of comparative demand to changes in prices. Companies could benefit from reviewing the flexibility of their pricing policies. Specifically, by flexing the p_{ijt} up or down in comparison to the prices of competitors for similar products.

Idle Capacity Costs. Products and services rendered are made possible by resources that have capacities to produce each time period. In equation (7) an input-output model is represented:

$$(7) \quad \text{Equivalent units of resources used: } U_{kt} = \sum_{ij} (D_{ijt} / u_{ijk}) \leq Q_{kt} \text{ for each resource } k \text{ at time } t.$$

Where u_{ijk} = units of product i with features j that could be produced in time period t with one unit of resource k . Again, Q_{kt} is the quantity of resource k available at time t . For example, if the demand in a restaurant were 100 meals per hour and each chef could make up to 10 meals per hour, then the equivalent of 10 chefs are needed (100 divided by 10). If 12 chefs were available then the restaurant is less efficient than possible by 2 chefs, but the demand would be fulfilled and the patrons delighted. However, if the demand were for 180 meals in a given hour, then 18 chefs would be needed, and if only 12 were available, then the restaurant would be inefficient, but demand would not be fulfilled.⁸

⁷ The budgeted capacity in units requires a process that equates all products across a common dimension, such as labor dollars, machine hours, filled beds in hospitals, filled seat miles in airplanes, etc.

⁸ There is a shortfall of 60 meals during that hour. The clientele could be given a reservation for a meal at a different hour. While there are other possible options, they may not be good ones. With pre-made meals the demand could be fulfilled, but this would be a different service package j that will not be as well received by the clientele. Similarly, if it were practical to share resources with

Equation (8) represents the idle capacity at time t for each resource k and is the quantity of resource k held minus the units of resource required to meet the demand:⁹

$$(8) \text{ Idle capacity of resource } k \text{ at time } t: I_{kt} = Q_{kt} - U_{kt}$$

The portion of fixed costs that relate to idle capacity is represented in equation (9):

$$(9) \text{ Cost of idle capacity: } \Omega_t = \sum_k (I_{kt}/Q_{kt}) * C_{00kt}$$

At peak loads the U_{kt} will approach Q_{kt} and Ω_t on tight or binding resources will approach zero.

During times when demand is low, Ω_t will approach the total of fixed costs, $\sum_k Q_{kt} * C_{00kt}$.

There will be intangible resources k for which the $u_{ijkt} \rightarrow \infty$. For example, a recipe or patented product may be started any number of times at any one time and is primarily limited in quantity by tangible resources such as workspace and workforce. For these unbounded resources, the U_{kt} will be zero. Thus, for intangible resources where capacity is near infinite, $I_{kt} = Q_{kt}$ and the cost of idle capacity will be approach $\sum_k C_{00kt}$. The cost of these resources should be related to the demand created by the resource rather than the capacity used.

Holding Capacity

Fixed costs and the risk of financial loss are proportional to capacities held. Why might a company hold idle or excess capacity?

Demand Variation. First, the demand for products and services will vary. There are slow times of the day and night, slow seasons of the year, and low points in the business cycle. During these low demand periods, Ω_t will be high. Predicting peaks and valleys in demand is less than

another restaurant and 6 chefs could be shared, then the demand could also be fulfilled, provided there is sufficient space for food preparation. However, then the recipes would also be shared, which would involve the loss of crucial trade secrets.

⁹ This definition embeds the "practical" capacity concept into the cost of idle capacity. A normalized capacity concept would substitute a ${}^nU_{kt}$, normal capacity of resource k , for the Q_{kt} in both equations (8) and (9). For example, a company might expect 85% of practical capacity to be their normal capacity. Above the 85% level operations become congested on too much of the time and the congestion affects customer relationships and the quality of service delivery. Thus, while it might be possible to run a facility 8,760 hours per year, allowances for daily peak demand results in a hours available of 7,446. In these circumstances, ${}^nU_{kt} = .85 * Q_{kt}$.

perfect. When demand is somewhat predictable, then advertising, promotional activities, and pricing policies can be used to even out operations.

Some variation in demand is due to predictable factors. As an example, a particular retail store may expect peak demand 5:30 PM to 7:30 PM Monday through Friday and Saturday all day until 5:00 PM with low steady demand at other times. The work schedule is arranged accordingly. Other variation in demand is unpredictable. For example, weather can suddenly affect the demand positively or negatively. A light rain on a Saturday might increase shopping as outdoor activities are cancelled. On the other hand, a severe storm will reduce volume as people stay home.

Part of the company's strategy may involve providing extra capacity for premium services. High reliability and availability are typical features of premium services. Thus, the premium service strategy results in idle capacity that is inefficient, but is necessary for "never running out". Similarly, government regulations that provide for meeting peak demand will exacerbate idle capacity costs during slow periods. For example, when an electric power company is required to provide for peak summer power demands, additional generating units will be required along with contracts for purchases of electricity on the power grid. The additional generating units will be idle during the slower seasons of the year.

Resource Variation. There is variation in the reliability of units of resources; for example, there are times when delivery vans break down or drivers report in ill. As a result, extra vans and drivers (similarly, airplanes and pilots, computers and service operators, design space and architects) are supported for those times when resources are unreliable. The lower the reliability of resources, the higher the idle capacity necessary to support the expected demand. Next, there will be variation within the productivity of resources, u_{ijkt} , and it would be normal to have I_{kt} available to handle the variation. The higher the variance in u_{ijkt} , the larger the I_{kt} needed to support a given demand.

When opportunity costs from unreliable resources are particularly high, then keeping idle capacity can be useful. The units of Q_{kt} held will be related to the lost opportunities from unreliable resources as in Equation (10):

(10) Opportunity cost from insufficient capacity of resource k at t : $\varphi_{kt} = \sum_{ijk} \eta_{ijt} (D_{ijt} - Q_{kt} u_{ijkt})$, but only when $(\sum_{ij} D_{ijt} / u_{ijkt} > Q_{kt})$ for at least one resource k at time t .

The opportunity cost will continue to occur until the demand decreases from dissatisfaction, expressed as a decline in $\beta_{ijt}(p'_{ijt}, {}^e F'_{ijt})$, or Q_{kt} is increased.

Important features in a premium service package for which there will be a high η_{ijt} generally include the reliable and timely delivery of the service. When Q_{kt} is in short supply, then the lost opportunity of providing the premium feature package will be high. Finally, when it takes a long time at high expense to dispose of a resource and there is some risk that the resource will have to be reacquired at high expense, it would be reasonable to keep some idle capacity that appears to be inefficient during the current time period. As an example, assume that a company owns a currently idle storage pit that cost \$10 million to dig and costs \$1 million in costs per year to keep insured and maintained. Further, it might cost \$5 million to refill the pit. If there were a reasonable chance that the hole will be needed over the next few years and then the pit must be re-dug at a cost of \$5 million, it would not be unreasonable to wait and see if the storage pit is needed rather than fill it in now.

Knowledge. Finally, idle resources may be kept to retain the knowledge that has accumulated with those resources. However, when resources are kept idle, the accumulated learning will decay. Thus, the start up after extended down time will not be efficient as time will be required for relearning processes.

Idle Capacity Cost Attributions. Cost attribution is assigning costs to products, functions, structures, or individuals. There is normally a causal or responsibility aspect to attribution. Exhibit 2 summarizes the sources of idle capacity and makes reasonable attributions of idle capacity costs.

Exhibit 2
Plausible Attributions of Idle Capacity Costs

<i>Source of the Idle Capacity</i>	<i>Idle Capacity Costs Attributable to</i>
Idle capacity due to variation in demand	Marketing
Capacity set by policy for peak demand to provide for premium product	Premium Product Cost
Capacity set for peak demand as a result of government regulation	Regulated Product cost
Idle capacity due to variation in the reliability of resources	Operating Manager
Idle capacity due to variation in productivity of resources	Operating Manager
Idle capacity due to the long cycle time and cost for disposal and replacement, which relates to the nature of the resources	General Manager
Idle capacity retained to maintain a knowledge base	General Manager

For premium services and government regulation of utilities, idle capacity appears attributable to product costs. A typical company charges the entire idle capacity costs to products and hence impact impacting prices and differential demand. Thus, it could be valuable in terms of comparative demand generation for companies to separately identify idle capacity costs.

Idle Capacity Impact on Costs and Prices. Since the practical or maximum capacity will generally be greater than the budgeted capacity, there will be a portion of the idle capacity cost impounded in prices for many companies. The formula would be:

$$(11) \quad \text{Price Impact} = (1 + \text{MU}\%) \times [(\sum_k C_{00kt} \times Q_{kt}) / \text{BC} - (\sum_k C_{00kt} \times Q_{kt}) / \text{PC}],$$

where PC is the maximum practical capacity in units. Since $\text{PC} > \text{BC}$ in equation (11), the price impact will be positive and the impact on demand from higher prices in equation (4) will be negative. Exhibit 3 illustrates a hypothetical weekly budget and pricing plan.

Exhibit 3
Example of the Impact of Including Idle Capacity Costs
on Pricing and Earnings per Week

	<i>Pricing Cost Allocation Base</i>	<i>Cost Based Budget Capacity</i>	<i>Cost Based Maximum Capacity</i>	<i>Flexible Price Maximum Capacity</i>
Fixed Costs		\$400,000	\$400,000	\$400,000
Allocation Base		5,000	10,000	10,000
Fixed Cost Unitized		\$80	\$40	\$40
Variable Cost per unit		\$40	\$40	\$40
Total Cost per unit		\$120	\$80	\$80
1 + Markup %		125%	125%	
Possible Price		\$150	\$100	\$125
Volume Sold		5,000	10,000	10,000
Revenues		\$750,000	\$1,000,000	\$1,250,000
Variable Costs		-200,000	-400,000	-400,000
Fixed Costs		-400,000	-400,000	-400,000
Income before taxes		<u>\$150,000</u>	<u>\$200,000</u>	<u>\$450,000</u>

Notice that the difference between budgeted capacity and maximum capacity has an impact in the total cost per unit and prices charged. Keeping the old markup rate with maximum capacity as a base could very well send the demand above the maximum capacity. One reason why budgeted capacity is less than maximum capacity is the result of prices that are high and the impact of a high prices on the volume sold. The circular process of planned capacity utilization and overpricing will reduce actual and planned volumes as time periods pass. If the planned volume in Exhibit 3 were to fall to 1,000 units, then the price would be \$550 ($125\% \times (\$400,000 / 1,000 + \$40)$) and little or no sales would occur and most of the units produced will go into inventory. This is normally the point at which the facility is closed. Before this dead end happens, the company management should figure out what is wrong and correct the costing and pricing. Finally, allowing the price to be flexible on estimated market demand could increase the profits substantially as demonstrated in the right hand column of Exhibit 3. The comparative demand should increase as prices are reduced¹⁰.

¹⁰ However, some competitors will respond with price cuts in subsequent periods and this will depend on how stuck they are on their cost-based pricing policies. Some companies will exit the market because their demand falls. The total volume for all companies should increase if many companies cut prices and consumers allocate more spending to this type of product or service.

R&D and Idle Capacity Costs. The knowledge created by research may be applied to an indefinitely large unit volume, hence knowledge capacity may be considered predominantly idle and not reflected in unit costs. Instead, research costs may be attributed to units of demand, rather than units of output. For example, if it takes \$200,000 in research cost to result in product features that have 20,000 units of comparative demand, then the price that is charged for that demand should reflect the \$10 per unit required (\$200,000 divided by 20,000 units). However, if only 10,000 of productive capacity are available, then either (1) the research should be reduced, (2) more productive capacity should be purchased, (3) the price should be increased to reduce the demand, or (4) some of the production should be outsourced.

Learning Impact on Costs

The use of resources causes learning across time:

$$(12) \quad \delta_{ijkt} = U_{ijkt+1}/U_{ijkt} - 1.0$$

Learning is desirable and important¹¹. When δ_{ijkt} is positive, then learning is occurring; when negative, then unlearning (forgetting) is occurring; when equal to zero, then no learning is occurring. When resource k is in use for product i and features j there should be learning with respect to that product. By analogy, when a resource k has *not* been used for a particular product, then unlearning (forgetting) will occur. For example, aircraft pilots become better with experience at producing a good landing at a particular airport, say New York LaGuardia, in varying weather conditions. If an extended period of time passes for a particular pilot without landing at LaGuardia in bad weather, then the next such landing will be of lower quality¹².

¹¹ Human resources are the primary learners in a company. Computer software can be made that mimics human learning. Other resources are more or less adaptable to new knowledge. Some δ_{ijkt} will be noise due to random variation in the productivity of units of resource. Hence, the δ_{ijkt} of interest is the expected amount.

¹² Similarly, a cargo ship at anchor for several years may not be seaworthy because of corrosion, unreliability of systems, and crew displacement. The whole ship will need general inspection and repairs, commissioning of all systems and training of new crew. If the ship sets too long, salvage could be the best option.

Learning and unlearning play a key role in comparative advantage, $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$. As new services or features are created, new protocols resulting in $u_{i+1j+1kt}$ must be learned. The higher the δ_{ijkt} , then the faster the $u_{i+1j+1kt}$ will approach the desired quality, output will increase, capacity increases, and unit costs fall. The newly created demand from marketing the new advantageous features will be rewarded faster with good margins. The higher the δ_{ijkt} , the lower the variable costs should be--as quality improves, fewer materials and less power are needed to produce each unit. Finally, the old protocols for each product must be forgotten and not hinder the new protocols for new features.

There will be variation in δ_{ijkt} across units of resource k . For example, some employees will learn more quickly than others and some computer software will be more adaptable than others to change. In general, maintaining a high $\beta_{ijt}(p'_{ijt}, {}^eF'_{ijt})$ will require adaptable resources that learn quickly.

When a unit of resource k is disposed of, the accumulated learning that is unique to that unit is lost to the company. If the units are identical, no learning should be lost. On the other hand, if the units are very different, then learning how to maintain and use the resource will be lost with the disposal. For example, if an airline had 50 Boeing 747s and then sold 20 of them, little if any learning would be lost. On the other hand, an airline that sold its last 747 would lose access to the accumulated learning related to 747s: parts, operating manuals, mechanics, ancillary software, and trained pilots.

Summary and Conclusions

Comparative advantage theory hypothesizes that the markets faced by companies are heterogeneous and do not approach equilibrium, but instead they are constantly changing because of disruptions by competitors. Companies focus in product differentiation with new features and prices to attain comparative demand. Learning and research, pricing flexibility, and the exclusion of idle capacity costs from product costs are important to support and evaluate comparative demand creation. However, without customer response to differentiated product features, a commoditization strategy will dominate and product R&D ceases to be important. Instead, R&D should focus on process improvements and protocols.

Managers following a differentiation strategy should reconsider strict cost-based pricing policies as comparative demand is based on both price and features in relation to competitive products. R&D is necessary for developing new services and products with new features. R&D should be traced to the comparative demand generated for purposes of management assessment. Further, comparative demand creation requires the reconfiguration of the capabilities of resources into new protocols. These new protocols require relatively rapid learning to achieve quality and efficiency. Old, but similar, protocols will need to be unlearned so that they do not get in the way of the new protocol performance. Management is involved with the process of configuring protocols and with the necessary learning of new protocols and the unlearning of old protocols.

Additional research is needed regarding comparative demand as this is the crucial factor that distinguishes the effectiveness of differentiated product strategy from commoditization. Further, there is a question related to decay factors for research knowledge—value decay is assumed to be 100% for financial reporting in the USA and is assumed to be lower in other countries under specific conditions. As US companies comply with international financial reporting standards over the next few years, they will need reasonable estimates of R&D value decay rates. Also critical for management evaluation of differentiation strategy is the tracing of product R&D so that both the products and the R&D may be evaluated. Finally, there is the basic question as to whether research knowledge builds value over time or whether it becomes an impediment to incumbents in learning new protocols--new entrants do not need to unlearn old protocols and knowledge.

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Equity Income: Do Investors Perceive It as a Component of Earnings?

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ABSTRACT

Equity investments are classified as significant influence investments when the investor owns between 20-50 percent of the outstanding stock of another publicly trade firm. In such instances the investment must be accounted for under the equity method according to Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 323 “Investments—Equity Method and Joint Ventures.” and International Accounting Standard 27 (revised), Consolidated and Separate Financial Statements (International Accounting Standards Board, 2008). As such, a proportionate share of investee reported earnings is recognized in investor earnings, referred to as equity income. However, equity income is a non-cash amount at the time it is recognized and is not necessarily to be later realized in cash. Equity income is a material component of earnings for a large number of firms. This paper proposes a methodology for determining if equity income, in spite of its non-cash nature, is perceived by investors as a positive and significant explanatory variable in determining the market value of the investor firm’s equity.

INTRODUCTION:

When a publicly traded entity owns between 20-50 percent of the outstanding stock of another publicly traded entity, the investor firm is presumed to have attained “significant influence” over the investee firm. As such, the investor must account for the investment under the “equity method” stipulated by Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 323 “Investments—Equity Method and Joint Ventures.”¹

A similar method of accounting exists under international accounting standards, known as International Financial Reporting Standard (IFRS). Under IFRS’s, the investment over which the investor has a 20-50 percent ownership is referred to “an associate” (International Accounting Standard 27 (revised), Consolidated and Separate Financial Statements, International Accounting Standards Board, 2008). Publicly traded U.S. companies are expected to begin a phased adoption of IFRS starting in 2014 (AICPA 2008). So, the equity method of accounting is relevant to both U.S. accounting and international accounting. Even if the U.S. adopts IFRS, the equity method will still be used by U.S. firms in accounting for significant influence investments.

Accounting rules for significant influence investments are based on the premise that an investor-firm need not control more than 50 percent of an investee’s outstanding common stock in order to exercise significant influence over the investee. “By voting those shares as a block, decisions [by the investee] can be swayed in the direction the investor desires” (Spiceland, et.al. 2009). The standard criterion used to determine if significant influence exists, even in the absence of control, is if an investor holds between 20 – 50 percent of the shares of the investee’s common stock. “An investment (direct or indirect) of 20 percent or more of the voting stock of an investee shall lead to a presumption that in the absence of predominant evidence to the contrary an investor has the ability to exercise significant influence over an investee. Conversely, an investment of less than 20 percent of the voting stock of an investee shall lead to a presumption that an investor does not have the ability to exercise significant influence unless such ability can be demonstrated.” (FASB ASC 323-10-15-8).

This ownership criterion is usually simple enough to measure. However, there are exceptions to which the 20-50 percent ownership does not constitute significant influence, and instances in which significant influence can be construed to exist even at less than 20 percent ownership (FASB ASC 323-10-15-3 through 11). However, such circumstances are beyond the scope of this paper.

The equity method of accounting falls short of the accounting requirements of consolidation, but requires more extensive recognition and measurement than an available-for-sale investment that is less than 20 percent ownership of the stock of another corporation. There are several aspects of the equity method that can be examined. This paper focuses on the treatment of dividends and income recognition under the equity method.

DIVIDENDS RECEIVED UNDER THE EQUITY METHOD - NO INCOME RECOGNIZED:

The equity method requires unique treatment of dividends received by the investor. For equity investments which are less than 20 percent of the outstanding stock of the investee, such as available-for-sale securities, the amount of cash dividends actually received is recognized as 'dividend income,' a component of traditional net income. In contrast, under the equity method for a 20-50 percent significant influence investment, cash dividends received by the investor are not recognized as income on the books of the investor. Instead, the carrying value of the investment is reduced on the books of the investor by the amount of cash dividends received by the investor. The amount of cash on the books of the investor, of course, is increased, but another asset account, the significant influence investment accounted for under the equity method, is reduced by an equal amount.

So, under the equity method, recognizing dividends received by an investor from an investee as income is not allowed. The reasoning behind this can be explained by the circumstance in which an investee reports a loss, but the investor coerces or pressures the investee into paying a substantial dividend, which the investor would be in a position to accomplish due to the significant influence it has over the investee by way of 20-50 percent ownership of investee stock. In such an instance, using dividends received to recognize income on the books of the investor would be antithetical to the actual economic circumstance of the investee (Warfield et al. 2008).

The rationale for this unique treatment is that since the investor has significant influence over the investee, it could pressure investee management to issue prohibitively large dividends to the investor that would inflate the investor's net income, but likely strain the investee. The inflated earnings of the investor would not be the result of an increase in investor-generated operating earnings, but merely a large dividend coerced from the investee, likely to the long-term detriment of the investee. Thus, the elimination of dividend income under the equity method also eliminates a potential source of inflated investor earnings and reduces the incentive of the investor to pressure an investee for an exorbitant dividend payment.

While recognizing dividends received as income may seem logical or intuitive, the rationale for the exclusion of dividends from income to avoid abusive dividends policies imposed on the investee has some merit.

EQUITY INCOME - NON-CASH EARNINGS:

The equity method also requires a special recognition and measurement of income. The investor records as income a theoretical share of the net income reported by the investee based on the proportion of the investee's stock owned by the investor. For example, assume investor A holds 30 percent of the outstanding voting shares of the stock of investee B. If investee B reports net income of \$1,000,000, investor A will include \$300,000 of equity income in its earnings.

The justification for an investor recognizing equity income is that since the investor possesses significant influence, it should recognize a proportionate share of the investee's net income. "The equity method is an appropriate means of recognizing increases or decreases measured by generally accepted accounting principles (GAAP) in the economic resources underlying the investments. Furthermore, the equity method of accounting more closely meets the objectives of accrual accounting than does the cost method because the investor recognizes its share of the earnings and losses of the investee in the periods in which they are reflected in the accounts of the investee." (FASB ASC 323-10-05-04).

The authoritative accounting source underscores this point again. "The equity method tends to be most appropriate if an investment enables the investor to influence the operating or financial decisions of the investee. The investor then has a degree of responsibility for the return on its investment, and it is appropriate to include in the results of operations of the investor its share of the earnings or losses of the investee." (FASB ASC 323-10-05-05).

The equity income recognized on the books of the investor is not necessarily related to a current or future receipt of cash. Instead, it is an accounting measure and accrual recorded on the books of the investor not resulting from a direct exchange of value between investor and investee. However, given the "accrual" nature of equity income and the fact that there is not necessarily a subsequent cash receipt to the investor equal or approximate to the equity income recognized, an issue can be raised as to how substantive in economic terms is equity income? Of particular interest is the market perception of equity income as a value-relevant component of reported earnings. Is equity income similar to other components of investor earnings, such as operating income?

The relevance of equity income would not be an issue except for the fact that for some investor-firms the amount of equity income relative to the investor's total net income is a material amount. Consider, for example, Chevron Corporation. For 2008 its equity income was \$5,366 billion out of a total of \$23,931 billion. Equity income represents 22.4 percent of Chevron's net income. Its earnings per share are clearly boosted by recognition of equity income. A search of the Compustat database for 2007 indicates that 15,985 companies report equity income in excess of \$1 million (or 1,704 firms report equity income over \$100 million) and 16,481 companies report equity income in excess of 5 percent of net income, using 5 percent as an arbitrary materiality threshold. So, the number of firms reporting material amounts of equity income is substantial.

The rationale for recognizing equity income discussed above has some logic in its defense. However, it is not without its shortcomings. Equity income is recorded on the books of an investor in accordance with generally accepted accounting principles. In bookkeeping terms, the investment account, an asset, is debited and an income account is credited. However, equity income is not a measure of the investor's operating performance resulting from the revenue earned in the course of the primary business activity of the investor. Instead, it is the result of the investor's acquisition of between 20-50 percent ownership in the outstanding stock of an investee.

Revenue earned by the investor in the ordinary course of business activity is collected in cash usually at the same time or shortly after the date the revenue is recognized. That is, most accounts receivables are collected within 30 or 60 days. Aside from uncollectible accounts, revenue recognized from ordinary sales revenue represents approximately the same amount of cash collected related to those sales.

Even for some accrued revenue that is not operating revenue, such as accrued interest income, the amount is expected to be collected in cash at some identifiable time in the near future. Even for accrued or accreted interest related to a zero-coupon bond, an amount of cash interest will eventually be collected equating to the interest revenue recognized during the life of the zero-coupon bond.

Equity income, on the other hand, does not represent revenue that will eventually be collected in cash, partially or in full. Most investees either pay negligible dividends due to a corporate policy of a low payout ratio pay no dividends at all. The median payout ratio during fiscal year 2007 was 0.0 percent with only 2,654 firms paying dividends out of 7,001 with data reported in Compustat. The empirical work of other studies indicates this. A study by Fama and French (2001) found that the proportion of firms paying regular cash dividends declined during 1978 to 1999 from 66.5 percent to 20.8 percent, a clear indication that fewer firms are paying dividends. A

separate study showed that the use of special dividends as a part of firms' payout policy, once widely used, are now rarely used (DeAngelo, DeAngelo and Skinner 2000). More recently, Skinner (2008) found that firms increasingly use share repurchases in place of dividends.

So, a reasonable presumption is that equity income is usually derived from an investee that pays little or no dividends. The equity income recognized on the books of investors will not be matched by a similar amount of cash dividends received and is thus primarily non-cash accrual income. Accordingly, equity income recognized on the books of the investor would appear to be a largely non-cash theoretical measure with a tenuous link to economic value.

Therefore, a valid research issue is to test if reported amounts of equity income by itself is value relevant and a second research question is how does the market perceive equity income relative to other components of earnings in valuing a firm's equity. We describe how such a study could be approached in the next section.

EXAMINING/MEASURING THE USEFULNESS OF EQUITY INCOME:

The justification for the equity method found in the FASB Codification was presented earlier in this paper. Whatever reasoning is used in defending the equity method, particularly the recognition of equity income, the equity markets are not obliged to value equity income simply because it is recognized by authoritative accounting standards. Equity income is distinct from other components of earnings since the amount of equity income recognized by the investor does not represent an amount that is expected to be collected in cash in the near future. In addition, equity income also is a material component of earnings on the books of investors. These two features of equity income raise an issue as to how equity income is perceived by those who invest in the firms that recognize equity income as a component of its earnings.

Few prior studies have addressed this issue. Graham and Lefanowicz (1996) examine the differences in the valuation of passive investments where income is recognized from dividends and changes in market value and nonpassive investments where the investor recognizes a percentage of the investees reported earnings. Correlations between investor and investee returns at the announcement dates of the investee's dividends and earnings corresponding to revenue recognition procedures for equity investments suggest a relation between passive and nonpassive investor valuation and investee dividends and earnings announcements.

Davis and Largay (1999) analyze the reporting, analysis and managerial perspectives of significant influence equity in six ways. They conclude that managers should favor alternative ways to the equity method when accounting for investments where significant influence exists. Davis and Largay (1999) favor the Proportionate Consolidation method and the Expanded Equity method to the Equity method. They conclude that both of these alternatives provide more information to the users of the financial statements than the single investment account on the balance sheet and single line item on the income statement provided by the Equity method.

However, there appears to be a limited amount of econometric research examining equity income recognized on the books of the investor. Thus, it appears that a study examining equity income would contribute to the research literature. The next section offers a suggested research design for examining the relevance of equity income.

A RESEARCH DESIGN FOR EXPLORING EQUITY INCOME:

A study examining the value relevance of equity income as a component of reported earnings by an investor firm can use a research design which measures equity income as contributing to the market value of the firms' equity. Reported amounts of equity income (ESUB) are reported on Compustat dating back twenty years. Data for other variables that would reasonably be used in the construction of a value-relevance model would also be readily available.

Ideally, a variable to capture the non-cash equity income would consist of the difference between equity income recognized by the investor and the investee dividends received by the investor. While a variable exists on Compustat that reports equity income, there is not a variable that reports dividend income. So the amount of cash dividends received is not available for a large sample of firms. It would be ideal for research design purposes to have both the amount of dividends received and equity income recognized so a variable could be constructed of the difference, i.e., equity income less cash dividends received. However, it is not feasible to include the amount of investee dividends received by the investor in a model to test the value relevance of purely the portion of equity income in excess of cash dividends received

Previous academic work has established a regression model as a valid test of the value relevance of financial statement elements to the market value of a firm's equity. An early study by Landsman (1986) uses balance sheet items to explain the market value of stockholders' equity. If ASSET is the market value of a firm's

assets and LIAB is the market value of a firm's liabilities, then the market value of stockholders' equity, MVE is given by:

$$MVE = \beta_1 ASSET + \beta_2 LIAB + \varepsilon \quad (1)$$

where ε is the residual term. Since market values of assets and liabilities are unobservable, Landsman used reported book values of assets and liabilities.

The above model, however, considers only the balance sheet in trying to explain the market value of a firm. In a different study, Barth, Beaver, and Landsman (1992), include only income statement items in their model. Their study tested the market valuation of pension costs reported in the income statement. They established the following model in their study :

$$MVE = \beta_1 NI + v \quad (2)$$

where $\beta_1 = 1/r$ and r is a discount rate. Barth et al. (1992) separate the net income amount (NI) into several income statement components.

According to Ohlson (1995), the market value of a firm's equity might be explained better by a model that includes both parts of financial accounting: a stock concept of value (book value) and a flow concept of value (earnings adjusted for dividends or 'clean surplus').

Some relatively recent studies have employed this methodology examining the value relevance of financial reporting elements. For example, more recent studies have been published examining other issues employing the methodology used in this study, including Ahmed et al. (2006), Henning et al. (2000) and Hughes (2000).

Since equity income is classified as an earnings component, it theoretically should be a relevant variable used by the market in determining the stock price of a firm. Thus, a model can be estimated that isolates equity income within the models designed and successfully tested in previous studies:

$$MVE = \beta_1 ASSET + \beta_2 LIAB + \beta_3 NI + \beta_4 EQUITYINCOME + \lambda \quad (3)$$

where

MVE = market value of equity of the investor firm

ASSET = book value of assets

LIAB = book value of liabilities

NI = operating income before taxes, exclusive of equity income

EQUITYINCOME = equity income reported under the 'equity method'.

Operating income before taxes, exclusive of equity income, is used as the non-equity income variable in order to set this variable on the same tax footing as the equity income variable, which is reported on Compustat on a “before tax” basis.

Based on existing accounting rules, an ex ante expectation should be that equity income, as a component of earnings, should be a positive and significant explanatory variable associated with the market value of a firm. In prior value relevance studies employing this research design, the ASSET and NI variables have been positive and significant, and the LIAB variable was negative and significant.

SUMMARY AND IMPLICATIONS FOR ACCOUNTING STANDARDS:

What would the findings of such a study have for U.S. and IFRS accounting standards? One possible outcome, a significant and positive coefficient, would confirm the relevance of current accounting rules. On the other hand, a finding of insignificance in regard to equity income would raise some question as to whether equity income as a component of earnings is relevant, a primary ingredient of accounting information. Thus, the finding of a study addressing the value relevance of equity income should be of interest to the financial reporting community.

FOOTNOTES

1. At the time of this writing the Financial Accounting Standards Board (FASB) had deemed that effective July 1, 2009 the FASB's Accounting Standards Codification™ (ASC) would be the primary authoritative source for financial accounting standards. Thus, this paper cites paragraphs in the FASB ASC 323 "Investments-Equity Method and Joint Ventures," as authoritative sources for accounting under the equity method. The FASB web site (www.fasb.org) contains the link to the Accounting Standards Codification™, which is available free of charge.

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