

THE CLARION BUSINESS AND ECONOMIC REVIEW

**VOLUME 8
NUMBER 1**

SPRING 2009



**BUREAU OF BUSINESS AND ECONOMIC RESEARCH
COLLEGE OF BUSINESS ADMINISTRATION
CLARION UNIVERSITY
CLARION, PA 16214**

CLARION BUSINESS AND ECONOMIC REVIEW

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I would like to thank Joseph P. Grunenwald, President of Clarion University, and Jim Pesek, Dean of the College of Business Administration for their continued support in developing this publication. In addition, I owe a special thanks to David Hartley, Assistant to the Dean of the College of Business Administration at Clarion University, for valuable assistance in developing a vehicle for providing this journal electronically.

It is my hope that the *Clarion Business and Economic Review* will continue to display the fine work of university faculty and businesses. Likewise, I anticipate that our best graduate students, faculty members, and a broader range of researchers will continue to contribute their work. Again, welcome to this edition.

Sincerely,

Rod D. Raehsler, Ph. D.
Director of the Bureau of Business and Economic Research
Editor of the *Clarion Business and Economic Review*

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Spring 2009

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The Treatment of Supply Substitutability in U. S. District Court and FTC Decisions

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ABSTRACT

An ongoing problem in the application of U. S. antitrust law is the delineation of the appropriate product market. Demand and supply substitutability, as measured by the coefficients of cross elasticity of demand and the coefficient of elasticity of supply, respectively, were introduced in the early 1950s as two possible criteria to define product markets. Although the implementation and calculation of both concepts involve similar problems, the courts have been more readily receptive of cross elasticity of demand as a criterion on which to define product markets. Since the author has addressed this issue in a recent work, he confines his attention in the present paper to reviewing and updating the use of the supply substitutability concept as a criterion for product market delineation in U. S. District Court and FTC decisions.

INTRODUCTION

In the early 1950s, the concepts of demand substitutability and supply substitutability were introduced as two criteria, among others, for use in the delineation of relevant product markets. (Bain, 1952, Machlup, 1952). These concepts were specifically articulated through the respective coefficients of cross elasticity of demand and cross elasticity of supply. The former of these coefficients measures substitutability in the eyes of consumers and is determined by dividing the percentage change in the quantity demanded of one product by the percentage change in the price of a different product. A positive sign of this coefficient of cross elasticity of demand suggests the possibility of a substitute relationship. The cross elasticity of supply coefficient, on the other hand, measures substitutability from the viewpoint of suppliers and is similarly determined by dividing the percentage change in the quantity supplied of one product by the percentage change in the price of a different product. Here, however, a negative sign of the coefficient of cross elasticity of supply is suggestive of a substitute relationship between the two goods under examination. That is, if the price of the one product increases (the denominator), suppliers will react by bringing more of it to the market. If they, in turn, decrease the quantity supplied of the other product (the numerator), it may well be that they are viewing these two products as interchangeable in supply and are substituting the now higher-priced product for the one's whose price has remained constant.

The problems associated with the implementation and calculation of cross elasticities of demand and supply has been well documented and discussed. (Armentano, 1990; Bishop, 1961; Clarkson and Miller 1982; Needham, 1969; Shepherd, 1997; and Stocking, 1957). Although these problems are not necessarily any less severe relative to cross elasticity of demand coefficients than for cross elasticity of supply coefficients, courts have generally been more inclined to accept and apply demand substitutability than they have been inclined to do so for supply substitutability in antitrust cases. The author has addressed this issue somewhat in a recent work. (Greco, 2005). Therefore, that issue will not be discussed within this paper. Rather, the paper will review and update the use of the supply substitutability concept as a criterion of product market delineation in the U. S. District Courts. Much of the information relative to the late 1950s through the late 1970s was culled from earlier articles by Karsh and Werden. (Karsh, *Virginia Law Review*, 1979 and Werden, *Marquette Lou Review*, 1992). The present article carries these works forward over time. It examines the forty-three District Court and FTC cases where cross elasticity of supply was a factor.

Early Disfavor of Supply Substitutability in the U. S. District Court and FTC Administrative Decisions

Although the U. S. Supreme Court has only rarely acknowledged supply substitutability, its treatment of the concept in *United States v. Columbia Steel Co.*, (U. S. v. Columbia Steel 1948), introduced it to the body of antitrust law.

This was a sections 1 and 2 Sherman Act case wherein the U. S. Government opposed the acquisition by U. S. Steel and its subsidiaries of the assets of a major independent steel fabricator because it felt that said acquisition would foreclose other producers of rolled steel products used in the fabrication process from selling to the acquired company. The task before the Court was to determine whether the relevant product market being potentially foreclosed should be limited to plates and shapes (which were manufactured by U. S. Steel and its subsidiaries) or should be extended to include all rolled steel products (i. e. plates, shapes and other products). The Court concluded that the producers of rolled steel products could make other such products interchangeable with the shapes and plates supplied by U. S. Steel and its subsidiaries. Consequently, the Court reasoned that the potential foreclosure of the proposed acquisition should not be focused on the acquired company's demand (and hence, supply needs) for just shapes and plates, but rather on its demand for all rolled steel products. (*Virginia Law Review*, 1979). Notice that there was no specific mention of cross elasticities of supply or any such coefficients computed. As stated above, specific coefficients of cross elasticity were not introduced to the economics literature until the early 1950s.

The first significant district court decision regarding supply substitutability was the Bethlehem Steel case of 1958, wherein the United States District Court for the Southern District of New York rejected the supply substitutability rationale of Columbia Steel. (*U. S. v. Bethlehem Steel*, 1958). Whereas Columbia Steel dealt with Sections 1 and 2 of the Sherman Act, Bethlehem Steel dealt with a charge of violating Section 7 of the Clayton Act. In the latter of these cases, defendant Bethlehem Steel had relied on a "production flexibility" argument. The district court rejected this argument contending that any product market definition which ignores buyers and presumably buyer interchangeability in favor of what sellers do or could do, is not meaningful. (*U. S. v. Bethlehem Steel*, 1958). Hence, the court's decision hinged on this Sherman Act – Clayton Act distinction. Even though the Supreme Court essentially overturned the above distinction in Grinnell, courts have often relied on Bethlehem Steel as precedent for discussing supply substitutability arguments.

The immediate impact of the Bethlehem decision is vividly illustrated in the disposition of the Crown Zellerbach Corp. case. Actually this was an FTC administrative decision of 1957 that originally predated the Bethlehem decision. It involved the merger of Crown Zellerbach with another producer of papers. The FTC, after determining that the relevant market was a group of coarse papers in eleven western states, ruled the merger unlawful and ordered divestiture. On appeal to the Ninth Circuit Court, the petitioner argued for a broader market definition on the grounds that the paper-making machines of the second company were capable of producing papers not in the FTC's market. However, the Ninth Circuit, on the basis of Bethlehem Steel, rejected this use of supply substitutability to enhance the product market. (*Crown Zellerbach Corp. v. FTC*, 1961). In the Reynolds Metals Co. case, the petitioner argued that the relevant product market should include decorative foil and florist aluminum foil because the 192 manufacturers of the former could easily convert their production facilities to produce the latter type of foil. The FTC ruled that only decorative foil should be considered as the relevant product. The D. C. Circuit Court rejected the substitutability argument of Reynolds because the other 192 manufacturers were not actually producing florist foil (*Reynolds Metals Co. v. FTC*, 1962). Soon thereafter, the U. S. District Court for the Western District of Pennsylvania employed similar logic in upholding the Government's attempt to block the acquisition of Kendall Refining by Pennzoil, both of whom were producers and refiners of Penn Grade crude oil. Although Pennzoil argued that producers of Penn Grade oil could produce other types of oil as well, the court felt that the fact that such producers were not currently doing so nullified Pennzoil's supply substitutability argument. (*United States v. Pennzoil*, 1965).

In the interim between the Reynolds Metals and Pennzoil cases, the U. S. Supreme Court issued its Brown Shoe decision. (*Brown Shoe v. U. S.*, 1962). In considering the relevant product market in Brown Shoe, the Court accepted the Government's contention that men's, women's, and children's shoes made up three distinct submarkets within the broad category of shoes. The Court viewed these submarkets as distinct lines of commerce. In its attempt to expound upon and elucidate its concept of a submarket, the Supreme Court inadvertently generated some confusion for future courts decisions by enumerating seven factors, one of which was the presence of "unique production facilities", to be used in determining the boundaries of any submarket. The problem generated was that the absence of unique production facilities suggests supply substitutability which, standing alone, is enough to invalidate any definition of a submarket even in the presence of the other six factors mentioned by the Court in Brown Shoe. However, if courts were to view the presence or absence of unique production facilities as only one of the seven factors to be weighed in determining submarket boundaries, they would be diluting the importance of the unique production facilities in determining such boundaries. That is, even in cases where there are no unique

production facilities and supply substitutability is indeed possible, if not easy, courts may settle for product market definitions that are too narrow. (Virginia Law Review, 1979).

For example, in General Foods Corp. v. FTC, the Third Circuit Court of Appeals eventually upheld the FTC's finding that the equipment used in the production of steel wool was distinct and entirely dissimilar from that required to make other cleaning devices, thereby contributing to this court's declaration that household steel wool products constituted a separate submarket (General Foods, Inc. v. FTC, 1967). Also in 1967, the district court for the Northern District of California held that sanitary paper products sold through paper merchants constituted a submarket again after concluding that the facilities requisite to the production of said products were unique. (U. S. v. Kimberly – Clark, 1967). Further, the FTC's contention that the production of aerosol and spray painting equipment differed from that of brushes and rollers was upheld in 1970 by the Seventh Circuit Court of Appeals (Beatrice Foods Co. v. FTC, 1970). Similarly, the Sixth Circuit Court of Appeals upheld the FTC in the Abex case by ruling that the technology appropriate to sintered metal brakes differed entirely from that for organic friction brakes. (Abex Corp. v. FTC, 1970). Yet another FTC decision against the concept of supply substitutability occurred in the L. G. Balfour case of 1971 (L. G. Balfour Co. v. FTC, 1971). Herein the Seventh Circuit Court of Appeals agreed with the FTC that the relevant product market included only insignia – bearing goods for national college fraternities and not all emblematic jewelry (not just fraternity products) as argued by the manufacturers involved in this case.

Further, district courts in California essentially ruled out supply substitutability in favor of more narrow market definitions in two 1972 cases. In the Calnetics case, the district court sided with the plaintiff's contention that the relevant product market consisted of only Volkswagen air conditioners. The defendant, however, had argued that the relevant market should be extended to include all automotive air conditioners on the grounds that the plaintiff's production facilities could readily be shifted from the manufacture of Volkswagen air conditioners to other automotive air conditioners. The Ninth Circuit Court of Appeals did, however, reverse this district court decision. (Calnetics Corp. v. Volkswagen, 1972). Then in the Twin City Sportservice case, the district court again opted for the narrow product market definition of concession services to major league baseball. The baseball team's owner had alleged that the exclusive concession franchise for the team's home games had monopolized these concession services. The Ninth Circuit Court of Appeals, however, remanded the case to the district court suggesting that said court use a supply substitutability analysis in reexamining the case. The Circuit Court felt that the relevant product actually was concession franchises sold by teams, not the services provided by the concessionaires (Twin City Sportservice, Inc. 1972).

The district court for the District of Maryland, in relying on Brown Shoe, also opted for a narrow product market definition in the Black & Decker case of 1976. For therein, the court viewed the distinctiveness of production facilities as but one factor to be weighed under Brown Shoe's test for a submarket rather than as a determinant of supply substitutability in and of itself. It was agreed by both parties that the relevant product market covered all manufacturers and sellers of gasoline-powered chain saws. However, the government asserted that there was a submarket for the production and sale of lightweight, cheaper versions of these tools. Although the defendants argued that the ease of production substitution eliminated any potential market power on their part in making and selling of the cheaper saws, the district court insisted that the other criteria of Brown Shoe outweighed the lack of unique manufacturer capabilities (U. S. v. Black and Decker, 1976).

Initial Judicial Acceptances of Supply Substitutability

Despite the presence of these adverse district court and FTC decisions of the 1960s and 1970 relative to the acceptance of supply substitutability in defining relevant product markets, there was a discernable countervailing trend established at the district court level in the 1970s. For example, an Illinois district court, in ruling for the defendant, agreed that the relevant product market was not merely garden chemicals but also included all products that affect plant or insect life in and around the home. (Science Products Co., 1974). In the same district court, it was also ruled in 1974 that college newspapers and other publications that had the capability of running national ads that could be observed by college students and not just college newspapers constituted the relevant product market (Case Student Advertising, Inc. 1974). Further, an FTC case of 1975 found the relevant product market to include two types of van trailers because of the ease of shifting of production among these two types (Budd Co., 1975).

Although the Third Circuit Court of Appeals fell into the Brown Shoe submarket trap in the Columbia Metal Culvert case of 1978, the district court had ruled that the relevant product market had to at least include the markets for both steel and aluminum culverts because of the ease of shifting production facilities among the production of these two types of culverts (Columbia Metal Culvert, 1978).

Mixed Judicial Acceptance of the 1980s

A number of district court decisions involving supply substitutability were rendered in the 1980s. In a 1980 ruling involving Michelin Tires, the Maryland U. S. District Court concluded that there were three appropriate product markets covering: (1) radial car tires, (2) radial truck tires, and (3) radial off-road vehicles (Donald B. Rice v. Michelin, 1980). The parties to the case had agreed that the product market should be divided according to use. The district court restricted its focus to radial tires after agreeing with testimony that the facilities required to produce said tires were distinct from such facilities for bias and bias-belted tires. In a further determination against the adoption of a broader market definition based on supply substitutability, the district court proclaimed that the production facilities requisite for new and retread tires were totally distinct. (Donald B. Rice v. Michelin Tire, 1980). However, the district court did find that new and retread tires were functionally interchangeable from a buyer's point of view and had a high cross elasticity of demand. Consequently, the court placed new and retread tires in the same product market. Therefore, in this case, the court felt that cross elasticity of demand trumped cross elasticity of supply.

In 1981, the U. S. Government brought a case against AT & T and the Bell Operating Companies alleging that the defendants had engaged in an unlawful combination to restrict competition from other telecommunications systems and from manufacturers and suppliers of telecommunications equipment. The government defined the relevant product market in terms of the manufacture and sale of particular technologically related equipment, describing said market in terms of its distinctness among related industries. The defendants, on the other hand, objected to defining the equipment market without elasticity of supply considerations. That is, they believed that the government's definition of the product market ignored the capacity of suppliers, both domestic and foreign, to provide equipment. On this basis, the defendants moved to dismiss the case. However, the U. S. District Court for the District of Columbia denied this motion for dismissal and allowed the government to essentially group submarkets into a broad industry definition, thereby rejecting the cross elasticity of supply argument of the defendants (U. S. v. ATT et. al., 1981).

Yet another district court ruling against the acceptance of a broader market definition based on supply substitutability was rendered in the Southern Pacific Communications decision of late 1982. Plaintiff Southern Pacific alleged that the Bell System violated Section 2 of the Sherman Act in regard to private microwave communications systems. In general, the plaintiffs contended that the relevant market was that for all business and government intercity telecommunications services, nationwide in scope. The defendants, however, argued for a more narrow market definition in terms of services and geography. Plaintiffs provided evidence to substantiate that MTS and NATS services displayed cross elasticity of demand and of supply with private line services (PLS). That is, they argued that since all of the above services were provided on the same network of intercity transmission facilities, suppliers of these services could shift among the provision of these services in response to shifts in consumer demand. (South Pacific Communications Co. v. AT & T, 1982). The District Court for the District of Columbia, while acknowledging that there was some truth to this contention, felt that the evidence presented by the plaintiffs on the degree of cross elasticity of supply was insufficient to support the contention that MTS and WATS were within the same market as private line services. Further, the court maintained that even if the aforementioned evidence had established a reasonable degree of substitutability between the MTS/WATS service and private line services, it still believed that it was appropriate to limit the relevant market to private line services. (Southern Pacific Communications v. AT & T, 1982).

However, the Pennsylvania Dental Association decision of 1983, the U. District Court for the Middle District of Pennsylvania disagreed with the aforementioned plaintiff's contention that the cross elasticities of demand and supply between prepaid service benefit dental programs and commercial prepaid indemnity programs were very low. Plaintiff Pennsylvania Dental Association had argued this in support of its contention that the market for the sale of prepaid dental care and of dental insurance could be viewed as a market made up of the two aforementioned district submarkets. The Dental Association was asserting that Blue Shield and other co-conspirators had virtually fixed the

price of prepaid dental care in Pennsylvania in violation of Section I of the Sherman Act. However, the district court essentially maintained that the plaintiff dental association had not shown that Blue Shield, commercial insurance carriers and other health service corporations did not compete for the business of purchasers of dental insurance. That is, the court felt opted for a broader, more inclusive market definition because it felt that the cross elasticities of demand and supply among these various suppliers of dental insurance were high (Pennsylvania Dental Association v. Medical Service Association of Pennsylvania, 1983).

Then in the National Bankcard decision of 1984, the U. S. District Court for the Southern District of Florida opted for a broader market definition based on an examination of cross elasticities of demand and supply. In this case, plaintiff National Bankcard had claimed that defendant Visa had violated The Sherman Act and thereby caused it (National) injury because its (Visa's) methods of setting and determining an interchange fee for its exchange system involved anticompetitive price fixing. Visa claimed that its fee was reasonable and that their regulations actually encouraged completion.

The district court concluded that the relevant market herein was the nationwide market for payment systems, inclusive of Visa and all payment services used in retail sales. The court, in finding that the plaintiff failed to prove its case, felt that Visa lacked market power in this relevant market and, therefore, could not impose any restraint detrimental to competition. The relevant market definition adopted by the court included, among other things, Visa, Master Card, merchants' proprietary cards, merchants' open book credit, cash, travelers cheques, ATM cards, and checks. After considering the cross elasticities of demand and supply between the various payment services available, the court concluded that these services were sufficiently close substitutes for Visa, and hence, had to be considered part of the same market. (National Bankcard Corp. v. Visa, 1984).

In the Hudson's Bay Co. case of 1986, the U. S. District Court of New Jersey again decided upon a broader product market definition based on cross elasticities of demand and supply. Plaintiff Hudson had alleged that defendant American Legend had illegally restrained trade in the American fur auction market and had co-conspired to monopolize said market. The district court, rather, determined that the relevant product markets were mink pelts produced worldwide and auction houses operating worldwide, not just in the U. S. After considering that cross elasticity of supply was based upon the capability of other production facilities to produce a substitute product, the court concluded that it made no sense to claim that the relevant product market be restricted to domestically-produced pelts. (Hudson's Bay Co. Fur Sales v. American Legend Corp., 1986).

Cross elasticity of supply was again mentioned as a crucial consideration in an examination of the relevant product market in Bhan v. NME Hospitals (1987). In this case, plaintiff Bhan alleged that the defendant hospital's decision to permit only MD anesthesiologists to administer anesthesia to patients violated sections one and two of the Sherman Act. The plaintiffs felt that nurse anesthesiologists could also provide this service and should be considered as viable substitute providers to the MDs. That is, in their view, the cross elasticity of supply between these two groups of professionals was high. However, the U. S. District Court for the Eastern District of California, while identifying the importance of cross elasticity of supply in delineating the relevant product market, declared that the plaintiff had presented no evidence addressing either cross elasticity of supply or cross elasticity of demand. The court concluded that the hospital's decision to exclude the services of nurse anesthesiologists did not undermine competition because under California law such nurses could only administer anesthesia under the supervision of a physician (Bhan v. NME Hospitals, 1987).

Another court acceptance of a broader market definition based partly on cross elasticity of supply occurred in FTC v. Owen-Illinois, 1988. Therein, the FTC was moving for a preliminary injunction to prevent the merger of the second and third largest glass container manufacturers. The FTC was concerned that the proposed merger might substantially lessen competition in the market for "all glass containers. The two defendants argued for a broader market definition to include glass, plastic, metal and paper packaging. The U. S. District Court for the District of Columbia, determined that even the FTC's most favorable evidence on cross elasticity of demand and cross elasticity of supply did not support the narrow market definition supported by the Commission. Rather, the court decided that dynamic intermaterial competition within many of these segments necessitated the much broader market definition of "all rigid-walled containers. Consequently, the court denied the FTC's motion for a preliminary injunction to delay the merger (FTC v. Owens-Illinois, Inc., 1988).

Later in 1988, the FTC found itself arguing for a broader product market definition in the Illinois Cereal Mills case. In this case, the FTC was objecting to the purchase by Illinois Cereal Mills, the operator of industrial dry corn mills in Indiana and Illinois, of some dry corn milling assets of a firm in Kansas. The FTC maintained that the relevant product market was made up of all major products produced by dry corn milling (basically all prime products used by food processors). The U. S. District Court for the Northern District of Illinois, Eastern Division, agreed that the evidence provided by the FTC demonstrated that industrial dry corn mills had the capability of gearing their operations to produce all prime products used by food processors. Even if certain industrial mills were not currently producing all of the prime products, the court reasoned, this did not preclude these firms from being considered in the assessment of the cross elasticity of supply issue so crucial to the proper delineation of the relevant product market. Hence, because of the high cross elasticity of supply capability of the industrial dry corn mills, the courts focused its decision on the likely effect of the proposed acquisition on competition in the market for industrial milled prime products. As a consequence, the court granted the FTC's motion for preliminary injunctive relief (FTC v. Illinois Cereal Mills, Inc. 1988).

In U. S. v. Syufy Enterprises, 1989, the U. S. Government charged that the defendant's planned acquisitions violated section two of the Sherman Act and section seven of the Clayton Act, focusing on first-run exhibits of motion pictures as the relevant product market. The defendant argued for a broader market definition on the basis of technological advancements relative to the distribution of motion pictures. Interestingly, the Government argued that the U. S. District Court for the Northern District of California should only use the cross elasticity of supply to define the relevant product market. The court disagreed noting that many previous antitrust cases had relied solely on the cross elasticity of demand in determining the relevant product market. However, the court pointed out that in the aforementioned Columbia Steel case of 1948, the U. S. Supreme Court at least made reference to the cross elasticity of supply as another possible factor in the determination of the relevant product market. The court, referring the 1984 Merger Guidelines of the DOJ, decided that it had to use cross elasticity of demand as the primary test in the determination of the relevant product market, but that it may also use cross elasticity of supply as a supplement thereto. Further, since the Government was arguing that Syufy's acquisitions had an anticompetitive effect on both the consumer and on the distribution of motion pictures, the court felt that it was appropriate to use both cross elasticity of demand and cross elasticity of supply to determine the relevant product market. The court ultimately broadly defined the relevant product market to include first-run exhibits of pictures, sub-run exhibits of films, and exhibition on home-video, cable television, and pay-per-view television. On the basis of various considerations, the court concluded that there is at least a mild level of cross elasticity of supply between first-run exhibits of motion pictures and distribution to the ancillary markets mentioned above. Having also found that the cross elasticity of demand among first-run films and those other alternative exhibit techniques among consumers was high, the court ruled that the Government had failed to prove its charges relative to the anticompetitive effects of the defendant's acquisitions (U. S. v. Syufy Enterprises, 1989).

The U. S. District Court for the Western District of Michigan, Southern District, relied on the cross elasticity of demand and the cross elasticity of supply in defining the relevant product market in U. S. v. Ivaco (1989). In this case, the U. S. sought to enjoin a proposed joint venture of two producers of automatic tampers, a machine used to place ballast underneath a railroad tie. The Government argued that the appropriate product market was that for automatic tampers. The defendants claimed that the product market should be broadened to include manual tampers and the newer high technology continuous action tamper made exclusively by one company. The District Court agreed with the Government's narrow product market definition of automatic tampers based on the Government's claims that customers were unable to react to price increases in automatic tampers by substituting other products (low cross elasticity of demand), and that other firms could not discipline a price increase in automatic tampers by entering the market with lower-priced products (low cross elasticity of supply). As a result, the court ruled that the defendants had failed to produce sufficient evidence to rebut the Government's case (U. S. v. Ivaco, Inc., 1989).

Two plaintiffs who were being denied access to a supply of food products they wished to distribute filed for injunctive relief in the U. S. District Court for the District of New Jersey in Bascom Food Products v. Reese Finer Foods. The court declared that the availability of supply of interchangeable goods from various suppliers constituted a restraint on the ability of any producer of an item to raise price above the competitive level. Accordingly, the court asserted that the delineation of a relevant market is based upon a determination of available substitutes. The court noted that cross elasticity of supply is based upon the capability of other production facilities to produce a substitute product and that the likelihood of including similar products or production facilities in any relevant market increased directly with the cross elasticity or interchangeability of use of these products or facilities.

However, despite its obvious recognition of the role played by cross elasticity of supply in the determination of the relevant product market, the court found that little evidence was offered in this case to establish the relevant product market(s). In the end, the court did grant the plaintiff's request for injunctive relief after balancing the potential relative hardships to the plaintiffs and defendants of the denial or granting of said request. (Bascom Food Products, 1989).

Continued Judicial Reliance on Cross Elasticity of Supply

A jury had returned a favorable verdict relative to the predatory pricing claim of plaintiff Liggett in a 1990 case. Both parties to this case agreed that the relevant product market was the entire cigarette industry (both branded and generic products) in the United States. The U. S. District Court for Middle District of North Carolina, Durham Division, substantiated that the appropriate product market definition turned on the cross elasticities of demand and supply. The court found that both of these cross elasticities were high between branded and generic cigarettes. Specifically with regard to cross elasticity of supply, the court noted the obvious that the same machines that made branded cigarettes could easily produce generic cigarettes. Since the cross elasticities were so high, the court found no economic justification for analyzing branded and generic cigarettes separately. Hence, the court decided that the average variable cost test used in alleged predatory pricing cases could not be applied. Consequently the court granted the defendant's motion to set aside the jury verdict and entered judgment for the defendant. (Liggett Group v. Brown and Williamson, 1990).

Michael Anthony Jewelers charged Peacock Jewelry, Inc., with unfair competition in a 1992 case before the U. S. District Court for the Southern District of New York. Peacock counterclaimed charges of monopolization and attempted monopolization. Peacock defined the relevant product market narrowly as "diamond-cut gold jewelry." MAJ opted for a broader definition including non-diamond cut gold chains and argued that Peacock's antitrust counterclaims had to be dismissed for failure to allege a plausible market. In attempting to substantiate its claim for the broader market definition, MAJ essentially contended before the court that there was a high cross elasticity of supply between diamond-cut and non-diamond-cut gold chains. The court granted that when the degree of substitutability between products in production was high, the cross elasticity of supply between said products will be high thereby placing these products in the same market. However, the court could not conclude that Peacock's narrow definition of the relevant market was patently implausible on the basis of the information provided to the court. The court maintained that arguments relative to cross elasticity of supply were relevant for motions of summary judgment, but were inappropriate in the consideration of motions to dismiss. On this basis, then, despite its recognition of the importance of cross elasticity of supply in defining relevant markets the court rejected MAJ's motion for dismissal of Peacock's antitrust counterclaims (Michael Anthony Jewelers, Inc. v. Peacock Jewelry, Inc. 1992).

Both the U. S. Government and private plaintiffs challenged the purchase of a local daily newspaper by a competing newspaper in Northwest, Arkansas in a 1995 case before the U. S. District Court for the Western District of Arkansas. After the court noted that cross elasticity of supply was recognized as an acceptable criterion to use in the determination of a relevant product market, it concluded that the acquiring and acquired newspapers should be included in the same product market since both were poised to become truly regional newspapers. That is, the court felt that there was a great deal of cross elasticity of supply among local daily newspapers in Northwest Arkansas (Community Publishers v. Donreg, Corp. 1995).

In U. S. District Court for the Southern District of New York, plaintiff AD/SAT alleged that the associated press was in violation of Section 2 of the Sherman Act for attempting to monopolize the narrowly defined market of the electronic transmission of advertisements to newspapers. At the time of the case, 1996, the predominant method of transmission ads to newspapers was overnight service provided by such companies as Federal Express. The court declared that the determination of reasonable interchangeability among products or services required the consideration of cross elasticities of demand and supply. In considering cross elasticity of supply, the court referred to the extent to which producers would shift resources from supplying a product or service to supplying a different product or service in response to price changes in that different market. In addition, the court asserted that the determination of cross elasticity of supply also required the consideration of new start-up entrants into the market. Ultimately, the available evidence led the court to conclude that the relevant market was the broadly-defined delivery of ads by any means, electronic as well as non-electronic. The court found ease of entry into this market

and, therefore, that there was high cross elasticity of supply among the various means of delivery ads. Indeed, the court noted that there was evidence that the Bell Companies were possibly going to enter the market. Therefore, the court granted the defendants' motions relative to the antitrust claims of the plaintiff. The latter's motion for reconsideration was denied and the case was dismissed (AD/SAT v. Associated Press, 1996).

Allegations of violations of section 2 of the Sherman Act were levied by plaintiff relative to the markets for rental and property management services in a given area in a 1997 case before the U. S. District Court for the District of Vermont. Said court identified the need to consider cross elasticity of demand and supply in determining the relevant product market. As in the preceding case (AD/SAT), the court noted that, in determining cross elasticity of supply, it had to consider which producers would shift resources from the supply of a product to the supply of a different product in response to price changes in that different market. However, in this case, the court determined that there appeared to be low cross inelasticity of demand and supply in the property management business. To wit, the court asserted that it would be unlikely that a company outside the relevant geographic area of the case under consideration would begin providing property management services in that area in response to a price increase by the defendants in this case. Herein, then, the court opted for a narrow market definition based on consideration of elasticities of demand and supply (Zschaler v. Claneil Enterprise, 1997).

However, in the Davies decision of 1998, the U. S. District Court for the Southern District of Iowa, Davenport Division, did adopt, on the basis of cross elasticities of demand and supply, a broader market definition than urged by plaintiffs in the case. The court felt that the plaintiffs' claims of violations of Section 1 and 2 of the Sherman Act and other violations seemed merely to infer that a portion of their anesthesiology business had been closed to them through the exclusive contract employed by the medical center defendant in this case, as well as by the plaintiff Davies' loss of staff privileges at said center. As a result, the court concluded that the plaintiffs had alleged injury only to themselves and had, therefore, not adequately, pleaded the antitrust injury essential under their antitrust claims. Nor, the court asserted, had the plaintiffs shown that they were even the proper antitrust plaintiffs. The court found that there was a high cross elasticity of demand of cardiac anesthesiology services (the relevant market) provided by the plaintiffs and other alternate anesthesiologists. Further, the court determined that cross elasticity of supply was high in this market because other anesthesiologists could, indeed, supply anesthesiology to cardiac patients. That is, the court threw out the plaintiff's narrow definition of the market based on their claim that other anesthesiologists do not or would not provide anesthesiology services for cardiac surgery. (Davies v. Genesis Medical Center, 1998).

The FTC sought to enjoin the proposed merger of the first and fourth largest, and the second and third largest wholesale distributors of prescription drugs in the U. S. in the U. S. District Court for the District of Columbia. While the FTC argued that the relevant product market should be the \$54 billion wholesale distribution of prescription drugs industry, the defendants claimed that the relevant market was entire the \$94 billion prescription drug industry. In its deliberations, the court relied on Brown Shoe's emphasis on the consideration of cross elasticity of demand and of supply. The court found that the services provided by prescription drug wholesalers did constitute a distinct submarket within the larger market for drug delivery, hence, settling on the more narrow definition offered by the FTC. Defendants had argued that prescription drug customers could replace wholesalers' services with an internally-created delivery system, thereby suggesting a rather elastic cross elasticity of supply. However, the court ruled against this reasoning because it believed that this potential alternative source of supply could not be included in the relevant market with regard to hospitals, independent pharmacies, and non-warehousing retail chains. (FTC v. Cardinal Health, 1998).

PepsiCo initially brought a Sherman Act, section 2 monopolization charge against Coca-Cola in U. S. District Court for the Southern District of New York in 1998. The plaintiff contended that the relevant product market was the market for "fountain-dispensed soft drinks distributed through food service distributors," as distinct from such soft drinks distributed through alternative means. Defendant Coca Cola opted for the broader market definition inclusive of all means of distribution. Although the parties did not initially focus on the cross elasticity of supply, the judge noted that the effect of such cross elasticity on the relevant market definition could be determined. After granting that the allegations in the plaintiff's complaint did describe an economically viable market relevant to its Section 2 claims, the judge declared that the plaintiff had to demonstrate that the alleged market was supported by market realities (Pepsi Co., Inc. v. Coca-Cola, Inc., 1998). In the continuance of this case in 2000, the court reemphasized the importance of cross elasticity of supply in the determination of a relevant product market. Plaintiff PepsiCo did not refute the defendant's claim that the production facilities for fountain syrup distributed through independent food

service distributors were not unique. Hence, the cross elasticity of supply between the production facilities of the various types of distributors of fountain syrup was relatively high. The court, therefore, ruled that PepsiCo's market definition was not sustainable and moved in favor of the defendant's motion for summary judgment (PepsiCo v. Coca-Cola, 2000).

Credit Chequers Information Services alleged that the cross elasticity of supply with regard to triple merge reports was virtually nonexistent in a 1999 case before the U. S. District Court for the Southern District of New York. Such reports consist of data compiled by the big credit reporting agencies which are required by certain businesses to ensure that they have a complete credit profile before making a credit decision. Plaintiff Credit Chequers claimed that it was impossible to purchase such reports if a consumer credit reporting agency could not obtain data from the requisite big three companies. Although the court essentially agreed on the narrow market definition based on the low cross elasticity of supply, it ruled that the plaintiff had failed to plead an adverse impact on competition in the relevant market caused by the practices of the defendants (Credit Chequers Information Services v. CBA, Inc., 1999).

Plaintiff Bepco, Inc., alleged that its sales in the aftermarket (remanufactured) for compressors and valves used in truck airbrake systems declined due to anti-competitive practices of defendant Allied Signal, Inc. Bepco argued for the narrow market definition inclusive of remanufactured Bendix equipment on the basis of its finding that it would be expensive for a consumer with a worn-out Bendix part to replace it with non-Bendix equipment. However, the court declared that the plaintiff had ignored cross elasticity of supply in formulating its product market definition. The court found that entry into the aftermarkets for compressors and valves had occurred by new re-manufacturers and that expansion had occurred by existing competitors. Thus, the court, based upon cross elasticity of supply, found the relevant market to be broader than that contended by the plaintiff. To wit, the court believed the relevant market to be the aftermarket for all replacement compressors and all replacement valves. It ultimately granted the defendants motion for summary judgment regarding the antitrust claims of the plaintiff (Bepco, Inc. and Heavy Duty Recycling Corp. v Allied Signal, Inc. 2000).

In the Continental Airlines case before the U. S. District Court for the Eastern District of Virginia, plaintiff Continental alleged that the defendants' agreement to restrict carry-on baggage size was a per se illegal restraint of trade that was not justified by any legitimate safety or security concerns. The defendants contended that their agreement could not constitute a per se restraint of trade, arguing, first that the per se rule's applicability was limited to certain categories of blatantly anticompetitive conduct. Second, defendants argued against the per se illegality of their agreement by attempting to link it to an industry safety standard. The court declared that the per se rule applied to any agreement restricting competition that had no purpose other than to stifle competition. The court determined that at the present stage of the proceedings, the plaintiff's claim of per se illegality did survive threshold attack and that the development of the factual record on the nature and effects of the restraint in the relevant market would determine if the agreement in question should be treated as a per se violation of Section 1 of the Sherman Act. Further, the court found that the agreement in question was not analogous to an industry-adopted safety standard, thus ruling against the defendants' second argument against the per se illegality of their agreement. The plaintiff herein contended that the relevant market was that for departing commercial airline passengers from Dulles. Defendants, implicitly on the basis of cross elasticity of supply, argued that the relevant market was "city pairs," or all flights from the Washington, D. C. metropolitan area to a particular location. This broader definition obviously brought in other nearby airports. The court disallowed this argument and, thereby, the use of cross elasticity of supply on the grounds that it was too early in the proceedings to decide whether the plaintiff's relevant market was sufficient. In fact, the court noted that if a restraint had obvious anticompetitive effects, a court could proceed directly to weighing its competitive effects even in the absence of a detailed market analysis. After further analysis, the court ruled that arguments concerning substitutability or cross elasticity of supply (such as the aforementioned argument of defendants) were inappropriate in the context of a motion to dismiss. Consequently, the court denied the defendants' said motion (Continental Airlines and Continental Express v. United Air Lines, et al, 2000).

In a 2001 case before the U. S. District Court for the Middle District of Florida, a representative of Vehicle Safety Systems alleged that Honeywell, Inc., had violated an exclusive distributorship contract. The plaintiff sold seat belts and related safety restraints to companies that converted vans for custom uses. Since the plaintiff argued that there is a great degree of difference between seat belts used in the van conversion industry and those used by original equipment manufacturers, it argued that the relevant product market should be narrowly confined to seat belts used in van conversion. However, defendant Honeywell asserted that there was perfect substitutability of both demand

and supply between seat belts sold to original equipment manufacturers and those sold to van converters. That is, the defendants sought a broader market definition based on high cross elasticity of both demand and supply. In reviewing the evidence presented, the court felt that it did not support the broader definition offered by the defendant. The court noted that, due to the difficulty of accurately measuring cross elasticities of demand and supply, other factors could be used as surrogates for such cross elasticities. Hence, the court was stressing the importance of cross elasticity of supply in the determination of the relevant product market. The court felt that its examination of the aforementioned surrogate factors justified its denial of the defendant's motion for summary judgment in this case. (Micahel E. Moecker for VSS v. Honeywell, 2001).

R. J. Reynolds Tobacco sought injunctive and declaratory relief and damages against Philip Morris, Inc., for alleged violations of Section 1 and 2 of the Sherman Act in conjunction with a Morris merchandising program wherein they paid retailers for advantageous display space. The relevant product market was established as the retail sales of cigarettes through retail outlets in the United States. The U. S. District court for the Middle District of North Carolina noted that the industry had recently witnessed the entry of several competitors in response to industry-wide price increases, an induction of high cross elasticity of supply. This consideration led to the establishment of the broad product market definition alluded to previously. Ultimately, the court ruled that the plaintiff had failed to establish an antitrust injury because the merchandising plan of Philip Morris did not foreclose a substantial portion of the relevant market. (R. J. Reynolds Tobacco v. Philip Morris, Inc., 2002).

The U. S. District Court for the Central District of California strongly endorsed the use of cross elasticity of supply in its Independent Ink decision of 2002. Independent Ink, a distributor and supplier of printed ink and ink products, contended that the defendant, Trident, Inc., had engaged in an illegal tying arrangement by requiring original equipment manufacturers to purchase and distribute their Trident ink as a condition for their purchase of Trident's patented print head systems. The court asserted that in defining a product market, one had to determine the cross elasticities of demand and supply. However, in this case, the court declared that the plaintiffs offered no evidence concerning the relevant product market. Instead, the court felt that the plaintiff's proposed product market was derived from a report hastily prepared by the plaintiff's vice-president. Rather, the court continued, a plaintiff must define the product market in a monopolization case based upon a defendant's market share which required an analysis of cross elasticity of supply. The court noted that there were several actual and potential suppliers of ink for Trident's system, suggesting a rather high level of cross elasticity of supply. (Independent Ink v. Trident, Inc. 2002).

Most recently, the U. S. District Court for the District of Colorado emphasized that, in defining the scope of the market, the court used cross elasticity of demand and of supply, with the latter of these measuring the responsiveness of producers to price increases. Both the plaintiff and the defendant agreed that there were two relevant product markets: (1) the market for rock music concert promotions/tickets and (2) the market for rock music air play, that is for advertising and promotional support on rock music radio. The plaintiff argued that there was low or no cross elasticity of supply between the market for rock concert tickets and that for all live music concert tickets. Hence, the plaintiff was stressing a rather narrow market definition based on this low cross elasticity of supply. Specifically, the court noted that the plaintiff had supplied sufficient evidence that the cost of acquiring a radio station or of obtaining a radio license was a significant barrier to entry, that is the court agreed with the plaintiff's assessment of the low cross elasticity of supply. Therefore, it was unlikely that another type of music promoter (such as country and western) would be able to easily enter the rock concert promotion/ticket services business via the acquisition of a rock radio station. Further, the court denied the defendant's summary judgment motion based on the rock radio promotional air time because of the evidence presented by the plaintiff on barriers to entry and other sufficient disputes of material fact. Again, the court was focusing on questions of cross elasticity of supply (Nobody in Particular Presents, Inc. v. Clear Channel Communications, 2004).

Summary and Conclusions

The concepts of demand substitutability (cross elasticity of demand) and supply substitutability (cross elasticity of supply) were introduced as criteria to be used, among others, to determine relevant product markets. Demand substitutability among consumers was more readily accepted than supply substitutability by the judicial system in the delineation of relevant product markets. Eventually, however, courts began to recognize and apply supply substitutability as an important criterion for use in market determination. This paper has examined the forty-three

FTC and District Court cases (the “lower court cases”) from 1957-2004 that the author was able to identify wherein supply substitutability (cross elasticity of supply) was at least somewhat of a factor). The first significant district court case involving supply substitutability was the Bethlehem Steel decision of 1958 rendered in the New York District. Therein, the court rejected the defendant’s product market definition based on its “production flexibility argument contending that any product market definition that ignored buyer (demand) interchangeability in favor of what sellers do or could so was not meaningful. That is, the court, at this point, totally discounted the relevance of supply substitutability in formulating an appropriate product market definition. The impact of this powerful ruling was illustrated in the Crown Zellerbach case originated before the FTC in 1958. In this case, the FTC rejected Crown Zellerbach’s broader market definition in a proposed merger. On appeal, the Ninth Circuit rejected the use of supply substitutability on the basis of the Bethlehem Steel decision.

Despite its outright rejection in these late 1950s cases, the concept of supply substitutability began to be considered as a possible market delineating criterion in cases in the early 1960s, beginning in 1962. In fact, supply substitutability was discussed and pondered in forty-one cases from 1962-2004. The concept was essentially disallowed or thrown out in three of these cases on what might be termed “technical grounds”. In the Bascom case of 1989, the New Jersey District Court strongly advocated the use of cross elasticity of supply as a market-determining criterion. Having said this, however, the court felt that the plaintiff had neglected use of cross elasticity of supply and had, in fact, offered very little evidence of just what the relevant product was. Further in both the Michael Anthony Jewelers case of 1992 before a New York district court and the Continental Airlines case of 2000 before a Virginia district court, the respective courts ruled that it was too early in the proceedings to decide on the relevant product market. That is, these courts asserted that arguments made relative to cross elasticity of supply were inappropriate for considering in motions to dismiss. Therefore, this reduces the number of district court decisions involving supply substitutability considerations to thirty-eight over the 1962-2004 period.

For the first nine of these cases, five of which were FTC cases and three of which were in California district courts, and one of which was in Pennsylvania district court, rulings were rendered in favor of narrow product market definitions. Although these represent cases wherein supply substitutability arguments were unsuccessful, at least the adjudicating bodies involved heard and considered arguments made relative to supply substitutability. Broader market definitions based on supply substitutability arguments were first accepted by the courts in 1974. In fact, in that year the Illinois district court accepted broader product market definitions based on such arguments in both Science Products and Case Student Activities cases. Thereafter, sixteen additional cases from 1975-2004 were characterized by the acceptance of broader market definitions influenced, at least in part, by supply substitutability considerations. Also, from 1976-2004, there were eleven cases wherein narrow product market definitions were adopted again, at least in part, on the basis of supply substitutability analyses. Hence, in two early cases, the consideration of supply substitutability as criterion for determining relevant product markets was totally disallowed. In three other cases, the use of this measure was rejected on technical grounds. Finally, in the remaining thirty-eight cases decided at the lower judicial level from 1962-2004, wherein supply substitutability was clearly used as a market-determining criterion, there has been nearly an even split, with narrow market definition being accepted in twenty cases and broader market definitions being adopted in eighteen cases. However, as suggested above, over the last three decades, the broader market definitions have outnumbered the more narrow definitions by an eighteen to eleven count.

As is indicated in Table I below, the original set of forty-three lower judicial cases addressing supply substitutability (cross elasticity of supply) was comprised of courts in fifteen different districts, as well as the FTC.

Table I
Forty-Three District Court and FTC Cases,
1957-2004, Involving Supply Substitutability

District Court or Agency					
	B	N	R	D	Total
Arkansas	1				1
California	2	4	1*		7
Colorado		1			1
D. C.	1	3			4
Florida	1	1			2
Illinois	3				3
Iowa	1				1
Maryland		2			2
Michigan		1			1
New Jersey	1			1	2
New York	2	1	1	1	5
North Carolina	3				3
Pennsylvania	2	1			3
Vermont		1			1
Virginia				1	1
FTC	1	5			6
TOTAL	18	20	2	3	43

*-Rejected by Ninth Circuit Court
B-Broad Market Definition Adopted
N-Narrow Market Definition Adopted
R-Use of Supply Substitutability Rejected
D-Supply Substitutability Disallowed on Technical Grounds

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A COMPARISON BETWEEN THE NEW AND THE OLD ACCOUNTING STANDARDS FOR BUSINESS COMBINATIONS

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INTRODUCTION

Financial Accounting Standards Board issued Statement No. 141R (FASB No. 141R) to revise the accounting standards for business combinations in December 2007. As compared with the old standards under FASB No. 141, there are major differences in the accounting for the following areas: acquisition-related costs, restructuring charges, acquired in-process research and development, acquired contingencies, goodwill/gain from a bargain purchase and noncontrolling interest, step acquisitions, and contingent considerations. They result in far-reaching consequences on acquisition activities and consolidated financial statements. This paper investigates and presents examples to demonstrate these differences.

ACQUISITION-RELATED COSTS

Under the new standards of FASB No. 141R, stock issue costs such as stock registration fees, stock underwriting fees and stock certificates printing fees continue to be treated as a reduction of paid-in capital. In the case of debt funding, bond issue costs continue to be treated as a contra liability and to be amortized as an expense over the life of the debt. All other acquisition-related costs are now treated as acquisition expenses, which include finder's fees, legal fees, accounting fees, consulting fees and internal management fees.¹ In contrast, under the old standards of FASB No. 141, the finder's fees, legal fees, accounting fees and consulting fees are capitalized as an investment asset, while the rest is expensed when incurred. Due to the fact that direct acquisition-related costs that previously capitalized as part of the costs of the investment asset can no longer be capitalized, acquirer's reported earnings will be negatively affected when it engages in acquisition activities. In addition, goodwill reported from business combinations will also be smaller because of the lower costs of the investment. These can potentially reduce acquisition activities and influence the ways deals are structured. The differences are summarized below:

	ACQUISITION-RELATED COSTS	FASB No. 141R (new)	FASB No. 141 (old)
A	DIRECT COSTS: Stock issue costs.	Dr. Additional paid-in capital (- equity)	Dr. Additional paid-in capital (- equity)
B	DIRECT COSTS: Bond issue costs.	Dr. Bond issue costs (- liability)	Dr. Bond issue costs (- liability)
C	DIRECT COSTS: Finder's fees, legal fees, accounting fees, consulting fees, advisory fees, valuation fees.	Dr. Acquisition expense (+ expense)	Dr. Investment in subsidiary (+ asset)
D	INDIRECT COSTS: Internal management and administrative expenses.	Dr. Acquisition expense (+ expense)	Dr. Acquisition expense (+ expense)

RESTRUCTURING CHARGES

Costs related to the restructuring of the acquiree's operations are now generally expensed when incurred. The only restructuring costs recorded as a liability assumed in an acquisition are those that are obligated (not just expected) to incur on the date of the acquisition. Under the old standards of FASB No. 141, a liability may be established for expected restructuring costs as part of the liabilities assumed by the acquirer in the acquisition and, in general resulting in higher goodwill. Because these restructuring costs are now charged to earnings when incurred in the post-acquisition period, the reported earnings of the combined entity will be negatively impacted by this new requirement. The differences are summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Expected restructuring charges	Expensed when incurred	As a liability assumed in acquisition
B	Obligated restructuring charges	As a liability assumed in acquisition	As a liability assumed in acquisition

ACQUIRED IN-PROCESS RESEARCH AND DEVELOPMENT

In-process research and development acquired in a business combination will no longer be expensed immediately after the acquisition occurs. Instead, under the new standards, they will be capitalized as intangible assets with indefinite lives subject to periodic impairment reviews until completion or abandonment. When the projects are completed, the in-process research and development assets will be amortized. If the projects are abandoned, the in-process research and development assets will be written off. It should be noted that FASB No. 141R does not change the accounting for research and development expenditures that are incurred after an acquisition, including those incurred to complete acquired in-process research and development projects. These expenditures continue to be expensed as incurred.ⁱⁱ As acquired in-process research and development will be capitalized instead of expensing, more identifiable assets will be recognized in the acquisition, in general resulting in lower goodwill. Furthermore, future earnings could be negatively affected because of impairment and/or amortization. The differences are summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Acquired in-process research and development	Capitalized as intangible assets	Expensed
B	Expenditures to complete acquired in-process research and development projects	Expensed	Expensed

ACQUIRED CONTINGENCIES

Under FASB No. 141R, contingencies (e.g., warranties and lawsuits) acquired in a business combination will be recorded at fair value as of the acquisition date (1) if the contingencies are contractual or (2) if the contingencies are not contractual but it is more likely than not that they meet the definition of an asset or a liability. Subsequently, only if new information is available such that the contingent liability (asset) is estimated to be higher (lower) than the original fair value, will the account be adjusted to its new estimated amount. In contrast, under the old standards of FASB No. 141, an acquired contingency is recognized if its occurrence is probable and its amount can be reasonably estimated; and no specific guidance is provided regarding its accounting subsequent to initial recognition. Because of the lower recognition threshold under the new standards, more contingent assets and liabilities will be recognized in an acquisition. The differences are summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Acquired contingencies as of the acquisition date	Recorded as fair value if contractual or noncontractual but more likely than not meet the definition of an asset or a liability	Recognized if probable and estimable
B	Acquired contingencies subsequent to acquisition	Reported at higher (lower) of acquisition-date fair value or subsequent estimated amount for contingent liability (asset)	No specific guidance

MEASUREMENT OF GOODWILL/GAIN FROM A BARGAIN PURCHASE AND NONCONTROLLING INTEREST

In a business combination, under the new standards, if the acquirer's consideration transferred is greater than the fair value of the acquiree's identifiable net assets received, the difference is treated as the acquiree's goodwill, and this goodwill represents both the acquirer's share and the noncontrolling interest's share. However, under the old standards, goodwill represents only the acquirer's share, but not the noncontrolling interest's share. On the other hand, if the acquirer's consideration transferred is less than the fair value of the acquiree's identifiable net assets received, under the new standards, the difference is accounted for as the acquirer's gain from a bargain purchase.ⁱⁱⁱ Under the old standards, the above resulting "gain/negative goodwill" shall be treated as a pro rata reduction of, mostly, the acquired fixed assets.^{iv} This is one of the major departures of the new standards from the old standards. Furthermore, under the new standards, the noncontrolling interest is measured at acquisition-date fair value, which would include not only the acquiree's identifiable net assets but also goodwill/gain,^v and it is now classified as part of the consolidated equity.^{vi} Under the old standards, the noncontrolling interest does not include goodwill/gain, and it may be reported as a liability. The differences are summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Consideration transferred > Net assets acquired	Dr. Goodwill	Dr. Goodwill
B	Consideration transferred < Net assets acquired	Cr. Gain	Cr. Fixed assets
C	Noncontrolling interest = Share of acquiree's	Net assets + Goodwill, reported as an equity	Net assets only, may be reported as a liability

Here are two examples to illustrate the differences.

EXAMPLE 1 – GOODWILL: The carrying amount (equal to the fair value) of the Acquiree’s identifiable net assets is \$80,000. Acquirer acquires 90% of the Acquiree’s outstanding equity share for a cost of \$90,000 in cash. What are the amounts of goodwill and the noncontrolling interest under the new standards and the old standards, respectively?

For simplicity it is assumed that the fair values of Acquiree and the noncontrolling interest can be inferred from Acquirer’s consideration transferred (i.e., there is no “control premium”). Therefore, in this example, the fair value of Acquiree is \$100,000 ($\$90,000 \div 90\%$) as Acquirer pays \$90,000 to acquire 90% of Acquiree and the fair value of the noncontrolling interest is \$10,000 ($\$100,000 \times 10\%$). **Under the new standards**, goodwill is reported at \$20,000, which includes both Acquirer’s share of \$18,000 ($\$90,000 - \$80,000 \times 90\%$) and noncontrolling interest’s share of \$2,000 ($\$10,000 - \$80,000 \times 10\%$). Furthermore, the noncontrolling interest is reported at its fair value of \$10,000, which includes its share of the net assets of Acquiree and its share of the goodwill ($\$10,000 = \$80,000 \times 10\% + \$20,000 \times 10\%$) = \$8,000 + \$2,000.

In contrast, **under the old standards**, goodwill is reported at \$18,000 ($\$90,000 - \$80,000 \times 90\%$) which is just Acquirer’s share of Acquiree’s goodwill. The noncontrolling interest is reported at \$8,000 ($\$80,000 \times 10\%$) and this amount does not include the noncontrolling interest’s share of Acquiree’s goodwill of \$2,000.

EXAMPLE 2 – GAIN FROM A BARGAIN PURCHASE: The same information as EXAMPLE 1 above, except that Acquirer pays only \$63,000. What are the amounts of gain from a bargain purchase and the noncontrolling interest under the new standards and the old standards, respectively?

With the same assumption as in EXAMPLE 1, the fair value of Acquiree is \$70,000 ($\$63,000 \div 90\%$). The gain from a bargain purchase is \$10,000 ($\$80,000 - \$70,000$) and the noncontrolling interest is reported as its fair value of \$7,000 ($\$70,000 \times 10\%$). The amount for the noncontrolling interest includes 10% of Acquiree’s \$80,000 identifiable net assets and 10% of the \$10,000 gain from a bargain purchase.

In contrast, **under the old standards**, Acquirer’s share of “negative goodwill” is \$9,000 ($\$63,000 - \$80,000 \times 90\% = -\$9,000$), which is generally treated as a pro rata reduction of fixed assets. The noncontrolling interest is reported \$8,000 ($\$80,000 \times 10\%$) and this amount does not include the noncontrolling interest’s share of Acquiree’s “negative goodwill.”

The above two examples demonstrate that, under the new standards, the goodwill/gain encompass both Acquirer’s share as well as the noncontrolling interest’s share, while under the old standards, it accounts for only Acquirer’s share, but not the noncontrolling interest’s share. As a consequence, under the new standards, the noncontrolling interest includes goodwill/gain, whereas, under the old standards, it does not. It can be noted from EXAMPLE 1, the goodwill, if any, recognized in a business combination is greater under the new standards than is under the old standards. Furthermore, it can be noted from EXAMPLE 2 that under the new standards, all identifiable net assets of the acquiree will now be recognized at fair value regardless of the amount of consideration transferred.

STEP ACQUISITION

If a business combination is achieved in more than one step, under the new standards, the acquirer’s previously held equity interest in the acquiree and the noncontrolling interest shall be re-measured at the acquisition-date fair value. All equity investments are added together in determining one single amount of goodwill/gain from a bargain purchase.^{vii} The gain/loss from the acquirer’s previously held equity interest in the acquiree shall be measured as if it were sold at its fair value at the acquisition date. FASB No. 141R, paragraph 34 provides for the guidance as follows:

“The acquirer shall recognize goodwill as of the acquisition date, measured as the excess of (a) over (b) below:

a. The aggregate of:

- (1) The consideration transferred measured in accordance with this Statement, which generally requires acquisition-date fair value.
- (2) The fair value of any noncontrolling interest in the acquiree.
- (3) In business combination achieved in stages, the acquisition-date fair value of the acquirer’s previously held equity interest in the acquiree.

b. The net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed measured in accordance with this Statement.”

This provision indicates that the acquiree’s net assets must be measured at the fair value at the acquisition date. The previously held equity interest and the noncontrolling interest must also be remeasured at the acquisition-date fair value. Goodwill/gain from a bargain purchase is the difference between (a) and (b), where (a) is the acquirer’s consideration transferred, noncontrolling interest and the previous equity investment, and (b) is the acquiree’s net assets acquired. Since the fair value of the acquiree encompasses its goodwill/gain on bargain purchase, the noncontrolling interest must also include goodwill/gain from a bargain purchase. The gain/loss from previous equity investment is also remeasured at the acquisition-date fair value that includes goodwill/gain from a bargain purchase. However, under the old standards, goodwill/“negative goodwill” is determined separately at each step of the acquisition. They don’t add together. This is another major departure of the new standards from the old standards. The differences are summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Should all investments be added together?	YES	NO
B	Should goodwill/gain be accounted for separately?	NO	YES
C	Should previous investments be re-measured?	YES	NO

Here is an example to demonstrate the differences:

EXAMPLE 3 – STEP ACQUISITION: On 1-1-Year 1 the carrying value (equal to fair value) of Acquiree’s identifiable net assets is \$500,000 and Acquirer acquires 15% of Acquiree’s outstanding equity shares for \$84,000 in cash. Acquirer adopts the cost method for Investment No. 1. On 12-31-Year 1 Acquiree reports a net income of \$100,000 and declares no dividends in Year 1. Therefore, on 12-31-Year 1 the fair value of the Acquiree’s identifiable net assets is now \$600,000 (\$500,000 + 100,000). On 12-31-Year 1, Acquirer acquires additional 75% of Acquiree’s outstanding equity shares for \$480,000 in cash. Under the new standards, what are the amounts of goodwill, gain on Investment No. 1 for Year 1, and noncontrolling interest at 12-31-Year 1? Under the old standards, what are the amounts of goodwill for investment No. 1 acquired on 1-1-Year 1, goodwill for Investment No. 2 acquired on 12-31-Year 1, noncontrolling interest at 12-31-Year 1, and gain on Investment No. 1 for Year 1, respectively?

For simplicity it is assumed that the fair values of Acquiree, Acquirer's previously held equity interest in Acquiree, and the noncontrolling interest can be inferred from Acquirer's consideration transferred (i.e., there is no "control premium"). **Under the new standards**, the amounts referred in FASB No. 141R, paragraph 34 are as follows (let G = goodwill):

$$\begin{aligned} \text{a(1) consideration transferred} &= \$480,000; \\ \text{a(2) noncontrolling interest} &= (100\% - 15\% - 75\%) \times (\$600,000 + G); \\ \text{a(3) previously held equity interest} &= 15\% \times (\$600,000 + G); \text{ and} \\ \text{b fair value of identifiable net assets} &= \$600,000. \text{ Therefore,} \\ G &= \$480,000 + 10\% \times (\$600,000 + G) + 15\% \times (\$600,000 + G) - \$600,000 \\ G &= \$480,000 + \$90,000 + 0.15G + \$60,000 + 0.10G - \$600,000 \\ 0.75G &= \$30,000 \end{aligned}$$

G = Goodwill = \$40,000

Gain on Investment No. 1 (15%) at 12-31-Year 1:

Cost of investment No. 1 (15%) at 1-1-Year 1		84,000
Fair value of Acquiree's identifiable net assets at 12-31-Year 1	600,000	
+ Goodwill	<u>+40,000</u>	
Fair value of Acquiree at 12-31-Year 1	640,000	
× Investment No. 1 ownership percentage (15%)	<u>× 15%</u>	96,000
Gain on investment No. 1(15%) at 12-31-Year 1 = 96,000 – 84,000		12,000

Noncontrolling interest (10%) at 12-31-Year 1:

Fair value of Acquiree's identifiable net assets at 12-31-Year 1	600,000
+ Goodwill	<u>+40,000</u>
Fair value of Acquiree at 12-31-Year 1	640,000
× Noncontrolling interest ownership percentage (100% – 15% – 75%)	<u>× 10%</u>
Noncontrolling interest (10%) at 12-31-Year 1	64,000

Under the old standards,

Goodwill for Investment No. 1

Cost of investment No. 1 (15%) at 1-1-Year 1	\$84,000
– Acquirer’s share of Acquiree’s identifiable net assets at 1-1-Year 1 = 15% x 500,000	<u>(75,000)</u>
Goodwill for investment No. 1 (15%) = \$84,000 – 75,000	9,000

Goodwill for Investment No. 2

Cost of investment No. 2 (75%) at 12-31-Year 1	\$480,000
– Acquirer’s additional share of Acquiree’s identifiable net assets at 12-31-Year 1 for the additional 75% ownership = 75% x 600,000	<u>(450,000)</u>
Goodwill for investment No. 2 (75%) = \$480,000 – 450,000	30,000

Noncontrolling interest at 12-31-Year 1 = 10% x \$600,000 = **\$60,000**

Gain on Investment No. 1 by 12-31-Year 1 = 15% x \$100,000 = **\$15,000**

This example illustrates that, under the new standards, goodwill is determined at the business combination date of 12-31-Year 1, i.e., \$40,000 for Investment No. 1 and No. 2 together. This amount of goodwill represents Acquirer’s share and the noncontrolling interest’s share of Acquiree’s goodwill at the acquisition date of 12-31-Year 1. However, under the old standards, each investment determines its own goodwill separately, i.e., \$9,000 for Investment No. 1 and \$30,000 for Investment No. 2. These two amounts of goodwill represent the Acquirer’s share of the Acquiree’s goodwill only on the investment dates of 1-1-Year 1 and 12-31-Year 1, respectively. They do not include the noncontrolling interest’s share of Acquiree’s goodwill.

Furthermore, under the new standards, the \$64,000 noncontrolling interest encompasses 10% of not only Acquiree’s \$600,000 identifiable net assets but also the \$40,000 goodwill. In contrast, under the old standards, the \$60,000 noncontrolling interest represents 10% of the \$600,000 Acquiree’s identifiable net assets only, but not the \$40,000 goodwill.

With respect to gain on Investment No. 1 (15%) acquired on 1-1-Year 1, under the new standards, it shares not only the \$600,000 Acquiree’s fair value but also the \$40,000 goodwill, resulting in a fair value of \$96,000 [15% x (\$600,000 + \$40,000)]. The cost of Investment No. 1 is \$84,000, resulting in a gain of \$12,000 (\$96,000 – \$84,000). However, under the old standards, the gain is 15% of the \$100,000 net income of Acquiree in Year 1, i.e., \$15,000 (15% x \$100,000).

As a result of these differences between the new and the old standards, the amounts reported in the consolidated financial statements are quite different. Moreover, under the new standards, the noncontrolling interest is reported as a part of the consolidated equity, whereas, limited guidance existed under the old standards and the noncontrolling interest may be reported as a liability.

CONTINGENT CONSIDERATION

The consideration transferred in a business combination may sometimes involve a contingent consideration depending on future events, such as meeting an earnings requirement or future stock prices. The contingent consideration may include additional cash payment if earnings exceed expectation or issuing additional stock if the stock price falls. If the contingent consideration changes, it concerns whether a gain or a loss should be recognized. It depends whether the contingent consideration is a cash payment or stock issuance. Under the new standards, the amount of contingent consideration is measured at fair value and recognized at the acquisition date. If there is a change in contingent cash payment, a gain or a loss should be recognized. However, if there is a change in stock issuance, no gain or loss shall be recognized. In other words, the reported amount of equity remains the same before and after the change. On the contrary, under the old standards, the contingent consideration is not recognized at the acquisition date. Any change of this contingent consideration, either cash payment or stock issuance, shall not be recognized as a gain or a loss. Instead, it is treated as a post-combination adjustment to the acquisition price. FASB No. 141R, paragraph 65, provides for guidance as follows:

“The acquirer shall account for changes in the fair value of contingent consideration that are not measurement period adjustments as follows:

- a. Contingent consideration classified as equity shall not be remeasured and its subsequent settlement shall be accounted within equity.**
- b. Contingent consideration classified as an asset or a liability is remeasured to fair value at each reporting date until the contingency is resolved. The changes in fair value are recognized in earnings...”**

This provision means that a contingent consideration must be taken into account at the acquisition date and classified as either a contingent cash payment or a stock issuance. The former must be remeasured and a gain or a loss is recognized, whereas, the latter is not. The differences can be summarized below:

		FASB No. 141R (new)	FASB No. 141 (old)
A	Should contingent consideration be measured and recognized at the acquisition date?	YES	NO
B	Should the change in contingent cash payment be recognized as a gain or a loss?	YES	NO
C	Should the change in contingent stock issuance be recognized as a gain or a loss?	NO	NO

Here is an example to illustrate the differences.

EXAMPLE 4 – CONTINGENT CONSIDERATION: On 1-1-Year 1 the carrying value (equal to fair value) of Acquiree’s net assets is \$500,000 (represented by 100,000 shares of \$5 par value per share common stock). On this date Acquirer acquires 100% of Acquiree’s outstanding common stock for the following considerations:

- \$400,000 cash payment on 1-1-Year 1,

- 20,000 shares of Acquirer's \$7 par value per share common stock at a fair value of \$10 per share (20,000 shares x \$10 per share = \$200,000)
- An additional cash payment of \$100,000 on 12-31-Year 2 if Acquiree earns at least \$300,000 operating income in Year 2.
- An additional issuance of Acquirer's common stock on 12-31-Year 2 sufficient to make up the deficiency of Acquirer's stock value at \$200,000 (20,000 shares x \$10 per share) if its stock price drop below \$10 per share on 12-31-Year 2.

Under the new standards, Acquirer is required to estimate the fair value of the contingent cash payment and the contingent stock issuance on acquisition date. Assume that Acquirer estimates their fair values to be \$70,000 and \$36,000 respectively. These fair value estimates of contingent considerations must be taken into account in determining the total considerations transferred in the business combination, i.e., \$706,000 (\$400,000 cash + \$200,000 stock + \$70,000 contingent cash payment + \$36,000 contingent stock issuance). All these numbers can be expressed in the following journal entry prepared by Acquirer:

Investment in Acquiree	706,000
Cash.....	400,000
Common stock (20,000 shares x \$7 par value per share).....	140,000
Additional paid-in capital [20,000 x (\$10 – \$7)].....	60,000
Contingent cash payment	70,000
Additional paid-in capital – Contingent stock issuance	36,000

In Year 1 Acquiree earns \$290,000 operating income and the fair value of the contingent cash payment increases to \$80,000. The \$10,000 (\$80,000 – \$70,000) increase in the fair value of the contingent cash payment is treated as a loss by Acquirer because the contingent cash payment is a liability. These numbers can be expressed in the following journal entry prepared by Acquirer on 12-31-Year 1:

Loss on revaluation of contingent cash payment	10,000
Contingent cash payment	10,000

It should be noted that the contingent stock issuance is not remeasured on 12-31-Year 1 and thus no entry shall be necessary.

In Year 2 Acquiree indeed earns at least \$300,000 operating income. As a consequence, Acquirer pays additional \$100,000 cash to the former Acquiree's stockholders. The \$20,000 (\$100,000 – 80,000) cash payment beyond the \$80,000 estimated fair value of the contingent cash payment on 12-31-Year 1 is also treated as a loss by Acquirer. These numbers can be expressed in the following journal entry prepared by Acquirer on 12-31-Year 2:

Contingent cash payment.....	80,000
Loss on revaluation of contingent cash payment.....	20,000
Cash.....	100,000

Acquirer's stock price indeed drops to \$8 per share on 12-31-Year 2. The deficiency of the Acquirer's stock value is \$40,000 [20,000 shares x (\$10 – \$8)]. Acquirer is now required to issue additional 5,000 shares (\$40,000 ÷ \$8 fair value per share now) to Acquiree's former stockholders. It should be noted that the total equity on 1-1-Year 1 was \$236,000 (\$160,000 common stock + \$40,000 additional paid-in capital + \$36,000 additional paid-in capital for contingent stock issuance). Now when Acquirer issues additional 5,000 shares, the equity should not be changed. It is only to make up the stock deficiency. As a result, no gain or loss should be recognized because it is within equity. All these numbers can be expressed in following journal entry prepared by Acquirer on 12-31-Year 2:

Additional paid-in capital – Contingent stock issuance.....	36,000
Common stock (5,000 shares x \$7 par value per share).....	35,000
Additional paid-in capital.....	1,000

Under the old standards, as these contingent considerations are not determinable at the acquisition date and thus are ignored in the determination of the cost of investment in Acquiree on 1-1-Year 1. No estimation of the fair value of these contingent considerations is required. Therefore, Acquirer's journal entry at the acquisition date on 1-1-Year 1 is as follows:

Investment in Acquiree.....	600,000
Cash.....	400,000
Common stock (20,000 shares x \$7 par value per share)	140,000
Additional paid-in capital [20,000 x (\$10 – \$7)].....	60,000

When Acquirer pays the additional \$100,000 cash payment to Acquiree's former stockholders on 12-31-Year 2, no loss is recognized. It is simply treated as an additional consideration paid in the acquisition of Acquiree, as follows.

Investment in Acquiree.....	100,000
Cash.....	100,000

Further, when Acquirer issues the additional 5,000 shares to Acquiree's former stockholders on 12-31-Year 2, the equity remains the same because it is only to make up the deficiency of the stock value. The increase in the Common Stock account will be offset by the decrease in the Additional Paid-in Capital account as if 25,000 (20,000 initial issuance + 5,000 additional issuance) shares were issued for a value of \$200,000. Therefore, Acquirer's journal entry for the issuance of the 5,000 shares is as follows:

Additional paid-in capital.....	35,000
Common stock (5,000 shares x \$7 par value per share).....	35,000

This example demonstrates that, under the new standards, contingent considerations must be measured at their fair value and recognized as part of the cost of investment. Later as the contingency is resolved, whether the gain or loss should be recognized depends on whether it is a contingent cash payment or a contingent stock issuance. The gain or loss is recognized in the former but not the latter. However, under the old standards, a contingent consideration is recognized when the contingency is resolved, and thus no gain or loss shall be recognized. These changes in the accounting treatments of contingent considerations may potentially reduce the use of contingent considerations that are classified as assets or liabilities in a business combination because of the earnings volatility that can result from the changes in their fair value.

CONCLUSION

This paper investigates the differences between the new and the old accounting standards for business combinations. It points out that, under the new standards, direct acquisition-related costs that previously capitalized as part of the costs of the investment asset (such as finder's fees and legal fees) can no longer be capitalized. They are now immediately charged to expense. In addition, charges related to the restructuring of the acquiree's operations are now generally expensed when incurred. Conversely, acquired in-process research and development will longer be expensed immediately after the acquisition occurs. Instead, they will now be capitalized as intangible assets. Furthermore, because of the lower recognition threshold under the new standards, more contingent assets and liabilities will be recognized in an acquisition.

If the acquirer acquires less than all of an acquiree, under the new standards, goodwill/gain from a bargain purchase must include both the acquirer's share and the noncontrolling interest's share. The noncontrolling interest will be measured at fair value and thus, it includes goodwill/gain from a bargain purchase. However, under the old standards, the goodwill/"negative goodwill" represents only the acquirer's share, but not the noncontrolling interest's share.

In the case of step acquisitions, under the new standards, the previous held equity interest in the acquiree and the noncontrolling interest must all be updated and measured at their fair value at the acquisition date. As a result, the gain/loss from the previous investment is now recognized at the acquisition date. Goodwill/gain from a bargain purchase is also redetermined for all previous and current investments altogether at the acquisition date. In contrast, under the old standards, goodwill/negative "negative goodwill" is measured for each stage of investment separately and not updated.

If the business combination involves contingent considerations, they must be measured at their fair value and added to the cost of investment on acquisition date. If the contingent consideration concerns cash payment in the future, the liability must be recognized and any change in its fair value must be recognized as a gain or a loss. However, if the contingent consideration involves stock issuance in the future, it will not be remeasured. Hence, no gain or loss shall be recognized.

REFERENCES

- ¹. FASB No. 141R, paragraph 59.
- ¹. FASB No. 2, paragraph 12.
- ¹. FASB No. 141R, paragraph 36.
- ¹. FASB No. 141, paragraph 44.
- ¹. FASB No. 141R, paragraph 34.
- ¹. ARB No. 51, paragraph 26, as amended by FASB No. 160.
- ¹. FASB No. 141R, paragraph 34.

KNOWING YOUR X'S AND Y'S: WAYS TO RETAIN YOUNG PUBLIC ACCOUNTANTS

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KNOWING YOUR X'S AND Y'S: WAYS TO RETAIN YOUNG PUBLIC ACCOUNTANTS

Abstract

Leaders have consistently identified retaining qualified staff in public accounting as the key concern in their operations. While many reasons have been given for these staffing issues, the current literature has not examined how generational differences impact retention and turnover in the public accounting industry. The different personality types of four generations in the workplace often cause conflict, misinterpretation, and confusion. Many staffing issues identified in public accounting may originate from these differences. This paper identifies causes of the significant turnover problem in public accounting, describes the four generations working in public accounting today, and offers suggestions to practicing managers on strategies for retaining top talent in the accounting profession.

Introduction

Finding and retaining top workforce talent is important in nearly every industry. The time, effort, and expense in training new workers as well as the experience workers amass over time are very valuable to an organization. The idea of building human capital within an organization is a popular concept in today's business climate. Public accounting is no different, as many leaders in the industry place an emphasis on staffing issues. Leaders have consistently identified retaining qualified staff in public accounting as the key concern in their operations since 1997, according to the American Institute of Certified Public Accountants, (AICPA), (PCPS, 2006). While many reasons have been given for these staffing issues, the current literature has not examined how generational differences impact retention and turnover in the public accounting industry. The different personality types of four generations in the workplace often cause conflict, misinterpretation, and confusion. Many staffing issues identified in public accounting may originate from these differences. Hence, the purpose of this paper is to identify the causes of the significant turnover problem in public accounting, describe the four generations working in public accounting today, and offer suggestions to practicing managers on strategies for retaining top talent in the accounting profession.

Turnover Causes

Public accounting firms have experienced problems retaining qualified employees for many reasons. Stress and burnout, a lack of work/life balance, and other alternatives in the accounting industry are three significant reasons why public accounting firms expect at least 80-85% of their staff to leave in the first three years of employment (Wright, Coleman & Glover, 1998; Glover & Schleifer, 1994). Within these sources of discontent, a survey of public accountants that have left the field shows that working conditions, work/life balance, and a desire for change

ultimately led them to seek other employment (Baldiga, 2005). Turnover in public accounting increases costs through increases in recruiting and training expense as well as lost efficiency (Law, 2005). Turnover can also lead to additional stress for those who remain in the profession. They are forced to take on a larger workload because of increasing demand of public accounting services due to more legislation and regulation. Simply put, demand for accounting services is on the rise, while the ability to retain the workforce needed to satisfy this demand is becoming more and more difficult.

High Stress Industry

Public accounting has traditionally been considered a high stress profession (Lee & Kleinman, 2003; Almer & Kaplan, 2002; Hooks, Thomas & Stout, 1997). Long work hours, travel away from home, and limited schedule flexibility are a few of the hurdles those in the area of public accounting may view as stressors. Some of the negative effects of job stress include job dissatisfaction, employee turnover, and substandard work. Reactions to this stress can come in the form of job-related tension and a desire to leave the firm (Lee & Kleinman, 2003).

Traditional Lack of Work/Life Balance

More than ever, work/life balance is a concern and a source of discontent for accounting professionals (Baldiga, 2005). An increasing number of accounting professionals want to give attention to commitments they have outside the office. Most notable in the literature are family responsibilities. With a larger percentage of single parent households and households with both parents in the workforce, less time is available to take care of issues in the home. Prior generations were accustomed to having one of the parents stay at home. Couple this reduction in available time with the increasing commitments children face in today's society, and it is no surprise that life outside of the office can take focus away from what is happening in the office. This can cause accounting professionals significant stress, and in fact, has been linked to high turnover within the area of public accounting (Almer & Kaplan, 2002; Hooks *et al.*, 1997). Even accountants who are given schedule flexibility face stress due to strong perceptions that those with significant family responsibilities are less committed to their firm or profession than their counterparts (Scheurermann, S., Finch, Lecky & Scheurermann, L., 1998; Allen & Meyer, 1990). Those who require added work flexibility may also be viewed as less of a team player and feel that their opportunities to advance in the firm are diminished (Almer & Kaplan, 2002). This "weakness" of having commitments that supersede those at work, whether perception or reality, has been found to cause stress in public accountants throughout the industry.

Alternative Career Options for Public Accountants

There are many alternatives to public accounting for accounting professionals in today's business climate. If an accounting student feels that becoming a Certified Public Accountant (CPA) is not attractive, they can choose to become a Certified Management Accountant (CMA), a Certified Internal Auditor (CIA), or other professional designation(s). The Occupational Outlook Handbook by the United States Department of Labor states that CPAs should have an excellent job outlook in the coming years because many accounting graduates are choosing other professional designations.

It is rare today to find a young worker that stays with one company for an extended period of time. This may be a direct result of generational differences in the workplace. Accounting professionals may begin their career at a firm to become a CPA, and then move to another public accounting firm that promises more money or other benefits. In a recent study of those in public accounting, fifty one percent of women and thirty nine percent of men believe that there are no or limited opportunities for advancement within their firm (Baldiga, 2005). This feeling that opportunity is scarce at their current job could lead to turnover if it is perceived that there are other opportunities outside the organization. Anytime a young public accountant is turned over, other firms realize the benefits of the recruiting and training costs the initial firm invested in the employee (Law, 2005). Some accountants are even choosing careers outside of accounting to increase their compensation and avoid outdated management styles in the

industry (Wright *et al.*, 1998). With all of these different alternatives for the potential CPA, it has become easier to leave public accounting, move from firm to firm, or avoid the area altogether.

Inflexible Business Climate

Public accounting is a mature industry. This industry has stood the test of time, and many top-ranking leaders within it feel that doing things the way they have always been done, with little modification, is the best way to secure what has been accomplished over time. Some would argue the turnover problem in public accounting has stemmed, in part, from this inflexibility. Although evidence exists that the usual management culture in public accounting fails to meet the needs of the current employee base, there is a strong resistance to change in the top ranks of firms (Wright *et al.*, 1998). Many current leaders started their career at a time when lifestyle habits and expectations in the workplace were much different. Their personalities and values are also much different than the accounting graduates of today. These differences will be discussed more in the following sections.

Generational Differences in the Workplace

New employees entering the workforce today have a number of differences relative to previous generations that currently hold leadership roles in mature businesses such as public accounting. These new employees are commonly categorized as Generation Y, while many of the current senior-level leaders are considered Baby Boomers. Those in between are from Generation X. Some from this generation may be in lower to mid-level leadership roles, but in most cases have not made it into the top echelon of leadership within public accounting. The breakdown of each generational work group by percentage in the workforce and the years these individuals were born are shown in Table 1.

Table 1 – Estimated U.S.A. Civilian Noninstitutional Workforce by Generation

ESTIMATED U.S.A. CIVILIAN NONINSTITUTIONAL WORKFORCE BY GENERATION		
	Number (in millions)	Percentage
Generation Y (born 1978-1990)	33.75	22.50%
Generation X (1965-77)	44.25	29.50%
Baby Boomers (1946-64)	62.25	41.50%
Schwarzkopf Generation (born before 1946)	9.75	6.50%
TOTAL	150	100%

Source: Martin & Tulgan (2006)

Veterans (Schwarzkopf Generation)

Veterans were the children of the Great Depression and both World Wars. These experiences of hardship and sacrifice are what made this generation who they are today. They are very patriotic and value family. Consistency is important to this group, and they prefer a top-down management style. Veterans convey information on a need-to-know basis, and expect feedback in the same fashion. They are very hard working, respect authority figures, and adhere to the rules in the work setting. Some describe this generation as a “work before fun” group that place any duty or responsibility above their own personal comfort or happiness (Martin, 2006).

Baby Boomers

Baby Boomers are well known for growing up in the 1960's, a time that was much easier than what their Veteran parents experienced. Many describe Baby Boomers as the original "Me Generation", because of their reputation as the most spoiled, self-indulgent generation in U.S. history (Martin, 2006). Many Boomers rebelled against their parents and ignored parental requests to get a good job and settle down when the time came. By the end of the 1960's, many of the Boomers were becoming older and decided to do what their parents intended by taking on more conservative job roles. The individuals who make up the Baby Boomers can be classified as "workaholics." They created the 70 hour work week and have a strong need for achievement (Zemke, Raines & Filipczak, 2000). These long hours helped affirm the Boomers self-worth after they discovered that they could not be successful in bringing a "social revolution" (Martin, 2002).

Generation X

Individuals from Generation X (Xers) were brought up in the most anti-child phase in U.S. history (Martin, 2002). Their Boomer parents had the highest divorce rates of any previous generation. Many from Generation X grew up in households where both parents worked. Because of these things, Xers learned to take care of themselves, and they bring this attitude to the work setting. This self-sufficiency was tested in the late 1980's, when many from this generation were entering the workforce doing jobs for which they were overqualified because of corporate downsizing and restructuring (Martin, 2006). The American culture conditioned the Xers to value immediate gratification. Xers are accustomed to instantaneous results due to new technology popularized during their formative years such as remote controls, pagers, ATMs, microwave ovens, and the birth of the Internet. Because of this technological rise, Xers desire quick, efficient, and direct communication (Caudron, 1997). These self sufficient, technologically-savvy workers are often in high demand.

Generation Y

Members of Generation Y have many of the same qualities as Xers, but with a few key differences. First, they are very proficient with technology, even more so than Xers. They often help their teachers and bosses with the very technology being used to teach them, which helps them shape how they learn (Martin, 2002). This same technology has made them conscious of global issues, as they can access information from and interact with people around the world with the click of a mouse, unlike any previous generation. They also have high self-esteem and a sense of empowerment given to them by their Boomer and Xer parents. Generation Y has a desire and propensity to learn unlike any other generation, as well. Technology has allowed this generation to learn anywhere, anytime, and they intend to do so. A key to keeping this generation at a job for a period of time is providing direction and learning opportunities (Lancaster & Stillman, 2002). With technology skills, a desire to learn, and high self-esteem, this group will require a great deal of maintenance, but could also be an invaluable asset to the corporate world as they continue to emerge into the workplace.

Impact of Generational Differences in Public Accounting

These generational differences have caused public accounting firms to try new approaches in order to retain talent. The following discussion offers suggestions for retaining key personnel in the accounting profession.

Work Load/Schedule Flexibility

As previously mentioned, stress caused from inflexibility in several areas of the public accounting environment are a contributing factor to employee turnover. In response to this problem, some accounting firms have introduced programs that allow employees to take advantage of flexible work arrangements (Baldiga, 2005). While some firms have started hiring more part-time professionals who work fewer hours than traditional full-time employees, others

have allowed employees to carry overtime hours into slower times of the year and use them as vacation time. Another way to increase flexibility is to allow professionals to work from home a certain number of hours per week. With technology advances such as laptop computers, high-speed Internet connections, web cameras, and audio capabilities over the Internet, those workers who choose to stay home can be nearly as connected to the office as those who are physically present (PCPS, 2006). This arrangement may actually increase flexibility without sacrificing productivity, and would look very attractive to those in Generations X and Y. When utilized, flexible work programs have been found to reduce stress related to work/life balance and emotional exhaustion, as well as increase an employee's intention to stay with their firm. In addition, it has been found that simply offering these flexibility programs to employees in public accounting can improve job satisfaction, even if the employee does not take advantage of it (Almer & Kaplan, 2002).

Relationship Building

Learning about an employee on a personal level can help build strong workplace commitment. That additional commitment may help staff members overcome difficult work scenarios more easily than they would otherwise. It has been found that employers who develop strong relationships with their new staff keep them as much as fourteen months longer than firms that only focus on output (Tarasco & Damato, 2006). This type of personal communication can build a family-like environment, again tying into workplace commitment. Whether it is a fifteen minute conversation at the water cooler about a weekend trip or a breakfast/lunch appointment with a staff member outside the office, any level of employee can help build these relationships. Organizing social activities outside the office environment can help new staff members see the personal side of their colleagues, further helping build this rapport. Those in Generation X and Y may become frustrated being limited to a traditional hierarchical management system where the chain of command is the only acceptable means of communication.

This rapport building can be accomplished in a more formal way by assigning a mentor to new staff additions. Although a mentor can help a new hire through technical questions that arise, another important function is to create a comfortable relationship through which questions can be answered about firm culture and personalities (Best, 2005). Rather than letting new employees figure out the details of their new environment on their own, this mentor can help alleviate some of the uncertainty in the learning process.

Progressive Career Development Strategies

Career growth opportunity was found to be the most important attribute for top accounting talent in a recent AICPA survey (PCPS, 2006). Similar surveys rank this attribute among the top motivators of public accountants. There are many ways a firm and its leaders can facilitate the professional growth of its employees.

Continuing professional education (CPE) is a big part of career development in public accounting. Accounting standards and rules are created and modified on a regular basis, and public accountants must be knowledgeable in these areas of change. Although CPE is a requirement in public accounting, firms can use CPE in creative ways as an advantage to help retain their talent. One idea is to give staff members a CPE budget each year that they can use to pursue any type of business-related training they desire, on top of required curriculum (Tarasco & Damato, 2006; PCPS, 2006). Topics such as sales, marketing, management, and leadership can provide great benefits to the individual opting to take these courses, and ultimately, the firm for which they work. Giving employees this type of autonomy can invigorate them, foster new ideas to improve the working environment, and help retain them. Generation Y employees love to learn, and they will seek out these educational opportunities wherever they exist.

It may also be beneficial to expose employees from Generation X and Y to meetings where firm decisions are made. Talented employees want opportunities to interact with top leaders in order to gain insight on the challenges they face (Baldiga, 2005). Exposing employees to leadership and decision making meetings can make employees feel valued and help them think in terms of the big picture, not just their immediate responsibilities.

Whenever staff members gain new expertise through these training programs or other avenues, firm leaders should allow them to show off their new expertise. Giving staff members the outlets to share what they know and help lead others in the firm can increase feelings of workplace commitment. Encouraging and facilitating this interaction is a

key component in retaining quality employees in public accounting (Best, 2005). During this knowledge sharing, it is important to recognize the contribution of the staff member and how it is appreciated. It is also important to mention other areas of accomplishment any time the opportunity presents itself. Showing employees that their contributions are noticed is an easy way to help retain talent, and is a valuable source of feedback that those in Generation X and Y look for in the workplace.

The creation of a comprehensive development plan is an effective tool in the review process. Using the review process as a constructive tool to assess performance helps retain employees by clarifying expectations (Best, 2005). When employees know what is expected of them, both presently and in their future development, this alleviates role ambiguity, a factor in job dissatisfaction and propensity to leave a firm (Lee & Kleinman, 2003). Firm leaders who use this formal review process may have better success in retaining quality accountants. Although previous generations may not have placed such an emphasis on feedback and assumed no news is good news, those in Generation X and Y often desire feedback on their performance.

Many of these career development suggestions are the basis of formal, comprehensive career development strategies (Baldiga, 2005). Firms are starting to recognize that employees in Generation X and Y require this type of planning in order to feel satisfied with their career path and direction within the firm. While some firms are becoming proactive in this area, many others do not have a formal plan in place.

Conclusion

Despite the availability of new ideas and an understanding of what new employees look for in a career in public accounting, partners and other firm leaders have been slow to implement these programs (Best, 2005; PCPS, 2006). These leaders must recognize that the time to act on these generational shifts is now. Young accountants will soon have to fill public accounting leadership gaps with the retirement of the Boomer leadership class. The work and lifestyle values of this new generation of public accountants seem to clash with current leadership expectations. Current firm leaders were expected to work long of hours and put their profession among the top of their life priorities in order to advance and be successful when they first entered public accounting. The desire for flexible work arrangements, comprehensive career development, and increased responsibility by younger accountants could be causing resentment in firm leadership. If this is the case, dialog and education should be initiated in public accounting to bridge this gap. It seems firm leaders that embrace these generational differences and adapt their organizations around them may be able to recruit and retain the best talent more readily than the competition, creating a competitive advantage.

Firms should begin training their staff on recognizing and appreciating generational differences in the workplace. Gen X staff members could learn to appreciate what the Veterans bring to the workforce. Baby Boomers could learn why they are so much different than Gen Y accountants, and what benefits these young people can bring to the table in the years ahead. Beyond personality issues, firm policy makers could use this education to restructure their employment and benefits packages to attract more of the top talent in the industry.

Knowing and understanding generational differences in public accounting are the first steps in gaining the ability to provide a competitive, productive, and pleasant workplace in which every generation will enjoy working.

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A COMPARISON OF THE FINANCIAL CHARACTERISTICS OF U.S., EU, AND JAPANESE CHEMICAL FIRMS

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ABSTRACT

In this study, we use the Multivariate Analysis of Variance (MANOVA) technique to compare the financial characteristics of U.S., EU, and Japanese chemical firms with data for the December 31, 2001-December 31, 2005 period. The multivariate test statistics indicate that the overall financial characteristics of U.S., EU, and Japanese chemical firms are significantly different. The univariate test statistics indicate that U.S. firms have significantly higher liquidity, inventory turnover, and equity ratios compared with EU and Japanese firms. We conclude that, because of their higher liquidity and lower debt ratios, U.S. firms are generally less risky than EU and Japanese firms. EU firms have significantly higher total-assets turnover and net-profit-margin ratios. Therefore, they have significantly higher asset returns compared with U.S. and Japanese firms. Because they have significantly higher asset returns and they use significantly more debt financing (i.e., financial leverage), EU firms also have significantly higher equity returns compared with their U.S. and Japanese counterparts.

I. INTRODUCTION

There is fierce competition between U.S., EU, and Japanese firms to capture a greater market share in each other's local markets and in the world's other markets. Knowing how the financial characteristics of firms compare in the U.S., the EU, and Japan would be helpful to corporate managers in managerial decision making. Financial ratios can be a useful tool in determining the financial strengths and weaknesses of firms. This study compares the financial characteristics of U.S., EU, and Japanese chemical firms with financial ratios to determine their relative financial strengths and weaknesses.

U.S. investors have substantial portfolio investments in the EU and Japan. Knowing how the financial characteristics of U.S., EU, and Japanese firms compare would be helpful to U.S. investors in their investment decision making. This study provides useful information to U.S. investors about the comparative financial characteristics of U.S., EU, and Japanese chemical firms in terms of liquidity, asset management, financial leverage, profitability and risk.

II. A BRIEF COMPARISON OF THE U.S., EU, AND JAPANESE ECONOMIES

The EU and Japan are two major trading partners of the U.S. During 2002-2005, U.S. exports to the EU have increased 26.4% and U.S. exports to Japan 7.7%. During the same time period, U.S. imports from the EU increased 32.2% and from Japan 13.7% (see: U.S. International Trade Commission, 2007). In 2005, the EU was the most important trading partner of the U.S. outside of North America, in both merchandise exports and merchandise imports. Japan was second in merchandise exports and third by merchandise imports (see: WTO International Trade Statistics, 2006). Table 1 provides a fuller picture of the importance of trade among the U.S., the EU, and Japan.

U.S. investors have substantial portfolio investments in France, Germany, the U.K. and Japan. U.S. portfolio investments in France, Germany, and the U.K. have increased from 5.32% of U.S. GDP at the end of 2001 to 7.09% at the end of 2005, and in Japan, correspondingly, from 1.69% to 3.30% (see: Abaroa, 2004; Nguyen, 2005, 2006; U.S. Department of Commerce, Bureau of Economic Analysis, 2007).

Table-1: Importance of the U.S., the EU, and Japan as Trading Partners (*)

	% of U.S. Trade with	% of E.U. Trade with	% of Japanese Trade with
U.S.	-	18.3	18.1
EU	19.1	-	13.2
Japan	7.5	5.2	-

(*) Source: WTO International Trade Statistics, 2006.

For most of the period of the study, there were 15 members of the EU. In 2004, membership increased to 25. The three countries included in this study are the three largest EU members by both population and GDP. Thus, France, Germany and the U.K. produced 55.6% of the EU-15 GDP, and had 52.9% of the total EU-15 population. Japan, another country included in the study, has the second largest GDP in the world. Table 2 provides statistical comparisons of these four countries, as well as the U.S.

Table 3 provides some evidence of the significance of international trade in the four countries and the U.S. The ratio of total trade (exports plus imports) to the GDP of a country is known as the index of openness. The values of this index increased over this period, most rapidly in Japan, which had the lowest index of openness, and least rapidly in France and the

Table-2: Comparisons of Constant Dollar GDP, Population and GDP Per Capita (*)

Country	GDP in 1990 Prices (in Billions of \$US)			Population (in Millions)			Per Capita GDP (in Thousands of \$US)		
	2001	2005	% Change	2001	2005	% Change	2001	2005	% Change
France	1,554	1,643	5.7	61.2	62.3	1.8	25.4	26.4	3.9
Germany	2,128	2,181	2.5	82.4	82.7	0.4	25.8	26.4	2.3
U.K.	1,288	1,415	9.9	58.9	59.7	1.4	20.8	23.4	13.9
Japan	3,386	3,623	7.0	127.3	128.1	0.6	26.4	28.3	7.2
U.S.	8,029	9,016	12.3	287.0	298.2	3.9	28.0	30.2	7.9

(*) Source: United Nations Statistics Division National Accounts Main Aggregates Database, 2007.

Table-3: Index of Openness: (Exports + Imports) as a Percentage of

GDP

(*)

Country	2001	2002	2003	2004	2005	% Change 2001-2005
France	68.8	69.2	68.4	70.3	72.7	5.7
Germany	77.0	78.1	81.1	86.4	90.5	13.5
U.K.	73.0	73.4	72.7	74.5	77.2	5.8
Japan	25.5	26.6	27.9	30.4	31.6	23.9
U.S.	31.5	31.3	31.5	33.2	34.2	8.6

(*) Source: United Nations Statistics Division National Accounts Main Aggregates Database, 2007.

U.K. The index grew more in Germany than in the other two EU countries, although it had the highest index of openness.

Chemicals constitute a significant proportion of total imports and exports in the U.S., the EU, and Japan. As shown in Table 4, chemicals are most significant in EU trade, and least, although still of considerable importance, in Japan.

Table-4: Chemicals Exports and Imports as Per Cent of Total Merchandise Exports and Imports (2005) (*)

United States		European Union		Japan	
Exports	Imports	Exports	Imports	Exports	Imports
13.3	7.6	15.5	12.6	8.8	7.3

(*) Source: WTO International Trade Statistics, 2006.

III. DATA AND METHODOLOGY

The data for the study were drawn from the DISCLOSURE database in July 2006. The research sample includes 139 U.S. firms, 74 EU firms, and 187 Japanese firms from the Chemicals and Allied Products Industry (SIC 28) with no missing financial information for the December 31, 2001-December 31, 2005 period. The EU sample consists of 25 French firms, 23 German firms, and 26 UK firms.

The financial characteristics of U.S., EU, and Japanese firms are compared by using eight well-known financial ratios. Financial ratio values may fluctuate from one year to the next. Financial ratios computed with data for a single year may be influenced by some temporary unusual circumstances occurring in that year and may not represent the true long-term financial characteristics of firms. Therefore, financial ratios used in this study are 5-year averages for the December 31, 2001-December 31, 2005 period computed with data from the year-end financial statements of the firms. The financial ratios used in the comparisons are presented in Table 5.

Using financial ratios to compare the financial characteristics of different groups of firms has long been a widely used research methodology in finance. A number of studies use financial ratios to compare the financial characteristics of bankrupt and non-bankrupt firms (see, e.g., Altman, 1968; Deakin, 1972). Rege (1984) uses financial ratios to compare the financial characteristics of firms which have been take-over targets with the financial characteristics of firms which have not been take-over targets. Hutchinson, Meric and Meric (1988) use financial ratios to compare the financial characteristics of UK listed and unlisted companies. Meric and Meric (1994) use financial ratios to compare the financial characteristics of U.S. and Japanese manufacturing firms.

Multiple Discriminant Analysis (MDA) and Multivariate Analysis of Variance (MANOVA) are the two multivariate statistical techniques most widely used in previous studies to compare the financial characteristics of different groups of firms with financial ratios. A detailed description of these multivariate techniques is available in Marascuilo and Levin (1983). The MANOVA technique is used in this study to compare the financial characteristics of U.S., EU, and Japanese chemical firms.

The financial statements and accounting practices of U.S., EU, and Japanese firms are quite similar and there is a great deal of commonality between the U.S., the EU, and Japan in terms of basic accounting principles and conventions [see: Coopers and Lybrand (1993) and Brown, Soybel, and Stickney (1993)]. This allows are to make meaningful comparisons with financial ratios between the U.S., the E.U., and Japan..

IV. MULTIVARIATE ANALYSES OF VARIANCE (MANOVA)

U.S. Firms vs. EU Firms

The MANOVA test statistics for the U.S. and EU firms are presented in Table 6. The multivariate F-value statistic is 10.36, which is significant at the one-percent level. It indicates that the overall financial characteristics of U.S. and EU chemical firms, as measured by the eight financial ratios used in the study, are significantly different.

Table-5: Financial Ratios Used in the Study as Measures of Financial Characteristics(*)

Financial Ratio Name	Financial Ratio Definition*
<i>Liquidity Ratios</i>	
Current Ratio (CUR)	Current Assets / Current Liabilities
Quick Ratio (QUR)	(Current Assets - Inventories) / Current Liabilities
<i>Turnover Ratios</i>	
Inventory Turnover (ITR)	Sales / Inventory
Total Assets Turnover (TAT)	Sales / Total Assets
<i>Financial Leverage</i>	
Equity Ratio (EQR)	Common Equity / Total Assets
<i>Profitability Ratios</i>	
Net Profit Margin (NPM)	Net Income / Sales
Return on Assets (ROA)	Net Income / Total Assets
Return on Equity (ROE)	Net Income / Common Equity

(*) All ratios are five year averages for the December 2001-December 2005 period.

Table-6: MANOVA Results: U.S. Firms vs. EU Firms

Financial Ratios	Means and Std. Deviations ⁽¹⁾		Univariate Statistics	
	U.S.	EU	F-value	P-value
<i>Liquidity Ratios</i>				
Current Ratio	3.00 (1.99)	1.86 (1.14)	20.57(*)	0.000
Quick Ratio	1.98 (1.72)	1.17 (0.69)	14.89(*)	0.000
<i>Turnover Ratios</i>				
Inventory Turnover	8.27 (4.88)	4.55 (3.62)	33.31(*)	0.000
Total Assets Turnover	0.92 (0.42)	1.07 (0.58)	4.64(**)	0.032
<i>Financial Leverage</i>				
Equity Ratio	55.7% (17.6%)	44.3% (16.5%)	21.16(*)	0.000
<i>Profitability Ratios</i>				
Net Profit Margin	4.6% (8.7%)	6.3% (9.4%)	1.74	0.188
Return on Assets	3.7% (6.4%)	5.5% (5.2%)	4.51(**)	0.035
Return on Equity	6.2% (11.0%)	11.0% (10.3%)	9.74(*)	0.002
Multivariate Statistics:			10.36(*)	0.000

⁽¹⁾ The figures in parentheses are the standard deviations.

(*) Significant at the one-percent level.

(**) Significant at the five-percent level.

(***) Significant at the ten-percent level.

The univariate test statistics indicate that U.S. firms have more liquidity compared with EU firms. Both liquidity ratios are significantly higher in U.S. firms than in EU firms at the one-percent significance level. The liquidity ratios measure the ability if a firm to meet its maturing obligations. Therefore, these results indicate that U.S. firms have less liquidity risk (i.e., U.S. firms are better able to meet their maturing obligations) compared with EU firms. However, if the liquidity ratios are too high, it can adversely affect the firm's profitability. In fact, later in this section, we will see that asset and equity returns are significantly higher in EU firms than in U.S. firms. One possible cause for this may be that U.S. firms have too much liquidity compared with EU firms.

The U.S. inventory-turnover ratio is significantly higher than the EU inventory-turnover ratio at the one-percent level. However, the EU total-assets-turnover ratio is significantly higher than the U.S. total-assets-turnover ratio at the five-percent level. This result implies that the turnover rate of non-inventory assets in U.S. firms is not as high as it is in EU firms. The low total assets turnover appears to affect asset profitability adversely in U.S. firms. The low inventory turnover in EU firms implies that EU firms have a higher average inventory level compared with U.S. firms. This should affect asset profitability adversely in EU firms. However, EU firms appear to be able to overcome this deficiency by achieving a higher total assets turnover and a higher net profit margin.

The equity ratio is significantly higher in U.S. firms than in EU firms at the one-percent level. This indicates that EU firms use significantly higher financial leverage (i.e., debt financing) compared with U.S. firms. If the financial leverage is

too high, it can increase the bankruptcy risk of a firm. However, financial leverage can also help the firm to boost its return on equity. In fact, as we will see in the next paragraph, the significantly higher EU return-on-equity ratio is partially due to the significantly higher EU financial leverage compared with U.S. firms.

The average net profit margin is higher in EU firms than in U.S. firms. However, the difference is not statistically significant mainly because the standard deviation of net profit margin (i.e., variability of net profit margin among firms) is very high both in the U.S. and in the EU. The return-on-assets ratio is significantly higher in EU firms than in U.S. firms at the five-percent level. According to the well-known basic DuPont equation, the higher return-on-assets ratio in EU firms is due to their higher total-assets-turnover and net-profit-margin ratios compared with U.S. firms. The return-on-equity ratio is also significantly higher in EU firms than in U.S. firms at the one-percent level. According to the well-known extended DuPont equation, the higher return-on-equity ratio in EU firms, compared with U.S. firms, is due to their higher return-on-assets ratios and lower equity ratios (i.e., higher financial leverage).

U.S. Firms vs. Japanese Firms

The MANOVA test statistics for the U.S. and Japanese firms are presented in Table 7. The multivariate F-value statistic is 51.50, which is significant at the one-percent level. It indicates that the overall financial characteristics of U.S. and Japanese chemical firms, as measured by the eight financial ratios used in the study, are significantly different.

Both U.S. liquidity ratios are significantly higher than the Japanese liquidity ratios at the one-percent level. It implies that U.S. firms are better able to meet their maturing obligations (i.e., U.S. firms have less liquidity risk) compared with Japanese firms.

Both turnover ratios are significantly higher in U.S. firms than in Japanese firms (inventory turnover at the one-percent level and total assets turnover at the ten-percent level).

Table-7: MANOVA Results: U.S. Firms vs. Japanese Firms

Financial Ratios	Means and Std. Deviations ⁽¹⁾		Univariate Statistics	
	U.S.	Japan	F-value	P-value
<i>Liquidity Ratios</i>				
Current Ratio	3.00 (1.99)	2.10 (1.23)	25.26(*)	0.000
Quick Ratio	1.98 (1.72)	1.57 (1.06)	6.84(*)	0.009
<i>Turnover Ratios</i>				
Inventory Turnover	8.27 (4.88)	5.16 (3.26)	47.68(*)	0.000
Total Assets Turnover	0.92 (0.42)	0.85 (0.28)	3.41(***)	0.066
<i>Financial Leverage</i>				
Equity Ratio	55.7% (17.6%)	52.2% (20.3%)	2.67(***)	0.103
<i>Profitability Ratios</i>				
Net Profit Margin	4.6% (8.7%)	3.4% (4.2%)	2.73(***)	0.099
Return on Assets	3.7% (6.4%)	2.6% (2.8%)	4.57(**)	0.033
Return on Equity	6.2% (11.0%)	4.2% (5.2%)	4.68(**)	0.031
Multivariate Statistics:			51.50(*)	0.000

⁽¹⁾ The figures in parentheses are the standard deviations.

(*) Significant at the one-percent level.

(**) Significant at the five-percent level.

(***) Significant at the ten-percent level.

The low turnover ratios in Japanese firms would affect their profitability adversely. In fact all three profitability ratios are lower in Japanese firms than in U.S. firms.

The U.S. equity ratio is slightly higher than the Japanese equity ratio. The difference is significant at the ten-percent level. This result implies that Japanese firms use more financial leverage (i.e., debt financing) to boost their returns on equity compared with U.S. firms. A high debt ratio increases the bankruptcy risk of a firm. Therefore, we can conclude that Japanese firms have more bankruptcy risk compared with U.S. firms.

U.S. firms appear to be more profitable compared with Japanese firms. All three profitability ratios are significantly higher in the U.S. than in Japan. U.S. net profit margin ratio is significantly higher than the Japanese net profit margin ratio at the ten-percent level. U.S. return-on-assets and return-on-equity ratios are significantly higher than the Japanese ratios at the five-percent level. Since U.S. firms have higher profitability and lower liquidity and bankruptcy risks, we can conclude that U.S. firms are likely to have more favorable market valuation vis-à-vis their Japanese counterparts.

EU Firms vs. Japanese Firms

The MANOVA test statistics for the EU and Japanese firms are presented in Table 8. The multivariate F-value statistic is 14.00, which is significant at the one-percent level. It indicates that the overall financial characteristics of EU and Japanese chemical firms, as measured by the eight financial ratios used in the study, are significantly different.

The Japanese quick ratio is significantly higher than the EU quick ratio at the one-percent level. The Japanese current ratio also appears to be higher than the EU current ratio. However, the difference is not statistically significant. The fact that the EU and Japanese quick ratios are significantly different but the current ratios are not implies that Japanese firms have smaller inventories compared with their EU counterparts. A comparison of the EU and Japanese inventory turnover ratios confirms this conclusion.

The Japanese inventory turnover ratio is higher than the EU inventory-turnover ratio. It implies that EU firms tend to have larger inventory levels compared with Japanese firms. However, the difference is not statistically significant. The EU total-assets-turnover ratio is

Table-8: MANOVA Results: EU Firms vs. Japanese Firms

Financial Ratios	Means and Std. Deviations ⁽¹⁾		Univariate Statistics	
	U.S.	Japan	F-value	P-value
<i>Liquidity Ratios</i>				
Current Ratio	1.86 (1.14)	2.10 (1.23)	2.11	0.147
Quick Ratio	1.17 (0.69)	1.57 (1.06)	9.11(*)	0.003
<i>Turnover Ratios</i>				
Inventory Turnover	4.55 (3.62)	5.16 (3.26)	1.73	0.190
Total Assets Turnover	1.07 (0.58)	0.85 (0.28)	17.36(*)	0.000
<i>Financial Leverage</i>				
Equity Ratio	44.3% (16.5%)	52.2% (20.3%)	8.84(*)	0.003
<i>Profitability Ratios</i>				
Net Profit Margin	6.3% (9.4%)	3.4% (4.2%)	12.01(*)	0.001
Return on Assets	5.5% (5.2%)	2.6% (2.8%)	34.44(*)	0.000
Return on Equity	11.0% (10.3%)	4.2% (5.2%)	49.63(*)	0.000
Multivariate Statistics:			14.00(*)	0.000

⁽¹⁾ The figures in parentheses are the standard deviations.

(*) Significant at the one-percent level.

(**) Significant at the five-percent level.

(***) Significant at the ten-percent level.

significantly higher than the Japanese total-assets-turnover ratio at the one-percent level. High total assets turnover rates would affect asset returns favorably in EU firms.

The equity ratio is significantly lower in EU firms than in Japanese firms at the one-percent level. It indicates that EU firm use significantly more financial leverage (i.e., debt financing) compared with Japanese firms. High financial leverage would increase the bankruptcy risk in EU firms. However, it would also boost the returns on equity.

All three profitability ratios are significantly higher in EU firms than in Japanese firms at the one-percent level. The high net-profit-margin ratio appears to be a key determinant of the high asset and equity returns in EU firms. In competitive world markets, it would be very difficult to increase the profit margin by increasing product prices. Therefore, the higher net profit margin in EU firms appears to be due to their achieving lower production costs compared with Japanese firms. Using the basic DuPont methodology, the significantly higher EU return-on-assets ratio appears to be the result of their significantly higher net-profit-margin and total-assets-turnover ratios compared with Japanese firms. Using the extended DuPont equation, the significantly higher EU return-on-equity ratio appears to be the result of their significantly higher return-on-assets ratio and financial leverage compared with Japanese firms.

V. SUMMARY AND CONCLUSIONS

In this study, we have compared the financial characteristics of U.S., EU, and Japanese chemical firms with the Multivariate Analysis of Variance (MANOVA) technique. The research sample consists of 139 U.S. firms, 74 EU firms, and 187 Japanese firms with no missing financial data in the DISCLOSUR database for the December 31, 2001-December 31, 2005 period. The multivariate test statistics indicate that the overall financial characteristics of U.S., EU, and Japanese chemical firms are significantly different. The univariate test statistics show that there are significant differences in terms of individual financial ratios.

The liquidity ratios are the highest in U.S. firms and the lowest in EU firms. This implies that U.S. firms are better able to meet their short-term obligations compared with EU and Japanese firms. The equity ratio is also the highest in U.S. firms and the lowest in EU firms. It indicates that U.S. firms use less financial leverage (i.e., debt financing) compared with their EU and Japanese counterparts. If we combine the results from the liquidity and equity ratios, we can conclude that U.S. firms have the lowest and EU firms have the highest bankruptcy risk.

U.S. firms have the highest and EU firms have the lowest inventory turnover. It indicates that EU firms carry the largest amount of inventories and U.S. firms carry the lowest amounts of inventories. Although the U.S. total inventory-turnover ratio is significantly higher than the EU inventory-turnover ratio, the EU total-assets-turnover ratio is significantly higher than the U.S. total-assets-turnover ratio. It implies that the turnover of non-inventory assets may not be sufficiently high in U.S. firms. This can be an important factor affecting asset profitability adversely in U.S. firms as compared with EU firms.

The total-assets-turnover ratio is the highest in EU firms and the lowest in Japanese firms. Along with the net-profit-margin ratio, the total-assets-turnover ratio is one of the two main determinants of asset returns. Both the net-profit-margin ratio and the total-assets-turnover ratio are significantly lower in Japanese firms than in EU firms resulting in the Japanese return-on-assets ratio to be significantly lower than the EU return-on-assets ratio. To improve asset profitability and to make their firms more competitive in world markets vis-à-vis their EU counterparts, Japanese managers should try to improve their net-profit-margin and total-assets-turnover ratios.

The net-profit-margin ratio is the highest in EU firms and the lowest in Japanese firms. Since it would be extremely difficult to raise product prices to improve net profit margin in competitive world markets, the low net-profit-margin ratio is likely to be caused by high production costs in Japanese firms. It implies that Japanese managers should try to lower production costs to increase the net-profit-margin ratio to make Japanese firms more competitive vis-à-vis their EU counterparts.

Both return-on-assets ratio and return-on-equity ratio are significantly higher in EU firms than in U.S. and Japanese firms. Along with the return-on-assets ratio, the equity multiplier (i.e., the inverse of the equity ratio) is one of the two main determinants of equity returns. The equity multiplier is significantly higher (i.e., the equity ratio is significantly lower) in EU firms compared with U.S. and Japanese firms. This implies that U.S. and Japanese managers should consider using more financial leverage (i.e., more debt financing) to become more competitive in world markets vis-à-vis their EU counterparts.

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