

## **Cross Elasticity of Supply: Everywhere but in Print**

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### **Introduction**

The concepts of cross elasticity of demand and cross elasticity of supply were introduced into the economic literature in the early 1950s as criteria that could be used, among others, to formulate appropriate definitions of product markets. These concepts deal with the relationship among goods as perceived by buyers and sellers, respectively. Operationally, these concepts are delineated by the computation of a coefficient of cross elasticity wherein the percentage change in a quantity demanded or quantity supplied of one good reacts to a percentage change in the price of a different good. A positive value for a coefficient of cross elasticity of demand suggests that the two goods are viewed as substitutes by consumers. On the other hand, a negative value for a coefficient of supply elasticity suggests that the two goods are viewed as substitutes in the eyes of producers.

In previous works, the author has demonstrated that, although the cross elasticity of demand is typically discussed in contemporary Microeconomic Principles, Intermediate Microeconomic, and Industrial Organization textbooks both in the U. S. and Canada, one hardly ever finds any discussion of the cross elasticity of supply in said texts. (Greco, 2005, Greco, 2008) Rather, the discussion of the cross elasticity of supply is more commonly, but not universally, found in the texts of Antitrust Law courses taught in U. S. law schools. (Greco, 2009) To some extent, this is a consequence of the fact that the judicial system has, over the years, come to use both the cross elasticity of demand and the cross elasticity of supply as appropriate, but not exclusive, criteria, in the determination of appropriate product markets.

### **The Prevalence of Cross Elasticity of Supply**

Yet this neglect of even the mention of the concept of cross elasticity of supply in the various economic textbooks is quite perplexing because of the high degree of supply substitutability often found among various goods produced or potentially produced by firms in various industries. Obviously, courts at the various levels of the legal system have recognized this. The question is why there has been such a neglect of supply substitutability (cross elasticity of supply) in academic circles, namely in the area of economics.

The author has, indeed, previously pondered over this very question. (Greco, 2005)

Although the U. S. Supreme Court has rarely acknowledged supply substitutability, it actually was the first court to do so. Further, it did so in 1948 prior to the actual introduction of the formal cross elasticities into the economics literature. For in the Columbia Steel case, the Court concluded that the relevant product market was all rolled steel products rather than just plates and shapes. The Court went on to state that producers of rolled steel products could alter their production to make products that were interchangeable with the plates and shapes supplied by U. S. Steel and its subsidiaries. That is, the production facilities of these producers could be altered to produce a variety of competitive products. (United States v. Columbia Steel Co., 1948) Though the Court chose not to use supply substitutability to expand upon the product market definition in the Brown Shoe case, it, at least, acknowledged the possibility by stating that the “the cross-elasticity of production facilities” might be of assistance in the proper delineation of the product market. In fact, one Justice issued an opinion separate from that of the majority in which he argued that the court had ignored supply substitutability. (Brown Shoe Co. v. U. S., 1962) Clearly there is a great degree of supply substitutability relative to the production of various types of shoes. For example, though consumers would not consider children’s shoes to be interchangeable with adult shoes, suppliers or prospective suppliers of these different types of shoes could easily shift resources among the production of each in response to changes in the prices of these different types due to demand and /or other conditions. Shortly, thereafter, three Supreme Court justices dissented from the majority opinion in the Rome Cable case arguing that the manufacturing interchangeability between aluminum and copper essentially placed insulated copper and insulated aluminum conductors in the same market (U. S. v. Aluminum Co. of America, 1964).

In addition, the ease of conversion of manufacturing facilities among the production of various products or services (supply substitutability) has been noted in several judicial decisions in U. S. District Courts, U. S. Appeals Courts, and in FTC cases over the years. Specifically, examples of such conversion of facilities include: that between the production of decorative aluminum foil and florist aluminum foil (Reynolds Metal Co. v. FTC, 1962); that between the production of insignia-bearing goods for college fraternities and all emblematic jewelry (L. G. Balfour v. FTC, 1971); that between the production of Volkswagen air conditioners and of other automotive air conditioners (Calnetics Corp. v. Volkswagen of America, 1972); that between the production of two types of van trailers (Budd Co.,

1975); that between the production of chrysanthemum and other types of ornamental plants (Yoder Brothers, v. California-Florida Plant Corp., 1976); that between the production of steel culverts and of aluminum culverts (Columbia Metal Culvert Co., v. Kaiser Aluminum and Chemical Corp., 1978); that between the production in industrial dry corn mills of all the various prime products used by food processors (FTC v. Illinois Cereal Mills, Inc., 1988); that between the production of diamond-cut jewelry and of non-diamond cut gold chains (Michael Anthony Jewelers, Inc. v Peacock Jewelry, Inc., 1992); that between the provision of interexchange facilities available to customers making calls from wireline telephones and those available to customers making calls from cellular phones (SBC Communications v. FCC, 1995); that between the provision of anesthesiology to cardiac patients by cardiac anesthesiologists and the provision of anesthesiology to such patients by other anesthesiologists (Davies v. Genesis Medical Center, 1998); and that between the provision of remanufactured Bendix compressors and valves used in truck airbrake systems and of the provision of non-Bendix remanufactured compressors and air brakes (Bepco, Inc. and Heavy Duty Recycling Corp. v. Allied Signal, Inc., 2000).

Hence, in these and other proceedings over the last 60-plus years, the concept of supply substitutability (cross elasticity of supply) has been recognized to varying degrees by all levels of the legal system. Many additional examples of supply substitutability can readily be recognized in the provision of both products and services in our economy. As a variation on an example offered long ago, there is a high degree of supply substitutability experienced by the producers of both right-handed and left-handed baseball gloves (Needham, Economic Analysis and Industrial Structure, 1969). The author has previously applied the concept of cross elasticity of supply to the determination of the suppliers in the market for terminal finance faculty in academic institutions. Though these suppliers would initially seem to be limited to those with appropriate terminal degrees in the finance discipline, many individuals with appropriate terminal degrees in economics have, in fact, entered the market for faculty positions in finance as the average remuneration for finance faculty has steadily risen above that for economics faculty. These economists have facilitated this conversion by such measures as taking additional finance courses and by focusing their research efforts primarily on the area of finance (Greco, 2008).

An example of note (pardon the pun) of supply substitutability can be found in the case of the production of mutes for trumpets. There are five types of mutes which a manufacturer can produce for trumpet. These are: (1) the Wah-Wah or Harmon Mute, a metal mute that generates a thin, tinny

sound; (2) the Straight Mute, a conical mute which is commonly used in both jazz and classical playing; (3) the Cup Mute, similar to the Straight Mute but having a large cup attached to the end, which makes the sound both nasal and buzz like; (4) the Pixie Mute, similar to but smaller than a Straight Mute, which generates an extremely nasal and high-pitched sound; and (5) the Plunger Mute made from the head of a kitchen sink plunger which creates dips and flares in the sound. The plunger mute is the type most commonly associated with the jazz trumpet ([www.ehow.com](http://www.ehow.com)). This innovative use of the kitchen plunger is generally traced to the “the Ellington effect” associated with legendary band leader Duke Ellington. Much of the credit for the origin of this effect through the use of the plunger mute is given to trumpeter Bubber Miley. ([jazzprofiles.blogspot.com](http://jazzprofiles.blogspot.com)). Given these aforementioned types of trumpet mutes, a manufacturer of mutes can easily alter the production of the various types of mutes in response to the changing popularity of various types of music. For example, if jazz becomes increasingly popular and the market price of plunger mutes rises due to an increase in demand by jazz trumpeters for such mutes, the manufacturer will shift resources from the production of other mutes to the production of more plunger mutes.

Consider also the case of motion picture production companies who may choose to produce a wide variety of films for different targeted audiences. If there is an increased demand for another particular type of film, such as family films, such companies can easily switch the use of their production facilities into the increased provision of family films. Then, there is the example of a firm’s provision of non-political content mailings sent at taxpayer expense to the constituents of members of Congress to inform them of what said members are accomplishing or attempting to accomplish, as opposed to this firm’s provision of political mailers designed to get the members of Congress re-elected. Though this is actually a case of sister companies which provide each of these types of separate mailings, they are both owned by the same businessmen and they share a common warehouse. Since the U. S. House bars federally financed constituent mailings within 90 days of an election, this part of the business is basically put to bed, and the business is shifted exclusively to the provision of political mailings. Hence, we have another obvious illustration of the ease of shifting production facilities from the generation of one product to that of another ([Daily Advertiser](#), Sept. 9, 2010). Yet another obvious and related example of supply substitutability is media advertising. Obviously, radio and television networks can charge premium rates for air time for ads during the political campaign season. Therefore, the media devote increased use of their facilities to the generation of political ads during the campaign season.

## **Summary**

The concepts of cross elasticity of demand and cross elasticity of supply were introduced into the economic literature nearly 60 years ago as criteria that could be used to help formulate appropriate definitions of product markets. These concepts deal with the relationship among goods as perceived by buyers and sellers, respectively. Interestingly, the author has discovered in previous works that, although the cross elasticity of demand is typically discussed in contemporary microeconomic principles, intermediate microeconomics, and industrial organization textbooks in the US and Canada, virtually no discussion of cross elasticity of supply is provided in said textbooks. Nor are even references made to cross elasticity of supply in these textbooks.

Upon further study, the author, however, discovered that cross elasticity of supply is more commonly, though not universally, found in the texts of Antitrust Law courses taught in US law schools. To some degree, this reflects the fact that the US Judicial system has, in fact, long viewed both the cross elasticity of demand and the cross elasticity of supply as appropriate for use in the attempt to determine product markets. Courts at the various levels of the legal system have obviously recognized the high degree of supply substitutability often found among various goods produced or potentially produced by firms in various industries. In fact, the US Supreme Court was the first court to implicitly do so in the Columbia Steel of 1948, actually decided prior to the introduction of the concept of cross elasticity of supply into the economic literature. Subsequently, the court considered cross elasticity of supply in the Brown Shoe decision of 1962 and the US v. Aluminum Co. of America case of 1964. As evidence of the regularity of the consideration of cross elasticity of supply as a market-determining criterion, the present article discusses a sample of ten decisions in US District Courts, US Appeals Courts, and in the FTC over the years 1962-2000 that did consider the concept quite prominently.

To bolster his argument that a high degree of supply substitutability can often be found among various goods and services produced by firms in various industries, the author discusses a number of appropriate contemporary examples of such in the provision of both products and services in our economy.

### **Conclusion**

Upon reviewing the above, the reader will probably identify many additional examples of supply substitutability or potential substitutability. It is clearly abundantly prevalent in our society. It is also clearly a valid, though not exclusive, criterion for the determination of relevant product and service markets. Its measurement, as embodied in the coefficient of cross elasticity of supply, should be used in conjunction with the cross elasticity of demand as first approximators of the appropriate market for specific products or services. Though the author has previously reviewed some possible explanations for the omission of the discussion of the cross elasticity of supply from contemporaneous economic textbooks, he basically remains puzzled by it (Greco, 2005). Perhaps ours is not to reason why the discussion of the cross elasticity of supply was allowed to die.

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