"EFFECTIVE COMPETITION" AND THE HARMONIZED TARIFF SYSTEM: AN APPLICATION TO THE VARIABLE IMPORT LEVIES ESTABLISHED BY THE EUROPEAN COMMUNITY'S COMMON AGRICULTURAL POLICY ON RICE

DAVID G. RABOY*
STEVEN M. SCHNEEBAUM**

I. INTRODUCTION

A. *Background*

As the economies of the world become increasingly interdependent, nations have sought, despite domestic political pressures towards the maintenance of protection, to remove barriers to trade. Successful negotiations have reduced tariffs and limited the scope of non-tariff barriers.[1] Multilateral negotiations continue to bring new sectors, such as services and agriculture, into the international arena.[2]

One natural consequence of this move toward liberalization is an attempt to find common benchmarks from which to negotiate. For instance, in agricultural trade, countries often provide protection through non-tariff barriers such as quotas, variable import levies,

* Chief Economic Consultant, Patton, Boggs & Blow, Washington, D.C. B.A. 1978, State University of New York at Buffalo; M.A. 1981, Ph.D. (Economics) 1986, George Washington University.

** Partner, Patton, Boggs & Blow, Washington, D.C. B.A. 1969, Yale University; M.A. 1970, Oberlin; B.A. 1976, Oxford; M.C.L.(A.P.) 1978, George Washington University.

1. Non-tariff barriers were the principal target of the Tokyo Round of GATT negotiations, which ended in 1979 with codes on licensing, standards, and government procurement. Trade Agreements Act of 1979, 19 U.S.C. §§ 2501-2581 (1988); *see* United States: Trade Agreements Act of 1979, 18 I.L.M. 1256 (1979) (discussing the Act and its connection to the Tokyo Round of trade negotiations).

2. *See* Ministerial Declaration on the Uruguay Round, Sept. 20, 1986, *reprinted in* BASIC INSTRUMENTS AND SELECTED DOCUMENTS: THIRTY-THIRD SUPPLEMENT 19, 23-24 (1987) (listing tariffs, non-tariff barriers, natural resources, textiles, and agriculture as negotiation subjects); Statement by the Chairman, 25 I.L.M. 1623 (1986) (noting that the purpose of the Ministerial Declaration was to launch negotiations on goods and services); *see also* The Dunkle Draft from the GATT Secretariat: Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, GATT Doc. No. MTN.TNC/W/FA (Dec. 20, 1991) [hereinafter Draft Final Act].

licensing schemes, and other measures.[3] It is notoriously difficult to negotiate over these items because there is no obvious point of equivalency between, for example, a quota and a licensing regulation. Accordingly, the principle of "tariffication" has gained currency in international negotiations. Through tariffication, agreed-upon procedures are used to convert non-tariff barriers to simple tariffs that afford the same levels of protection.[4] The new "tariff-equivalent," whether stated in specific or *ad valorem* form, provides the otherwise elusive common benchmark for negotiations. Once tariff-equivalents have been set, it is a fairly simple matter to negotiate their reduction.

Other attempts to find a common "language" for trade negotiations have preceded, and in fact are a prerequisite to, tariffication. For instance, until recently, there were many different classification systems in common use to categorize goods for tariff purposes.[5] In modern times, customs duties have not been simple, across-the-board surcharges on all items presented for importation; rather, they have varied according to the type of imported merchandise. Certain types of goods attract duties, and others do not. Tariffs on some products will be higher, and on others lower.[6] The need to make such tariff decisions may stem from a number of legislative objectives: (1) to protect a certain domestic industry; (2) to seek government revenues from a specific sector of the consuming public; (3) to regulate a specific segment of the domestic market; and (4) to permit increased competition in the market, whether or not domestic production facilities are threatened.

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3. For example, the United States imposes quotas to protect domestic peanut production. *See* David G. Raboy & Teri Simpson, *A Methodology for Tariffication of Commodity Trade In the Presence of Quality Differences—The Case of Peanuts*, 15 WORLD ECON. 271, 271 n.1 (1992). As discussed in this Article, the European Community imposes variable import levies to protect domestic rice production. *See infra* notes 74-94 and accompanying text.

4. For an understanding of how tariffication is utilized in international negotiations, see Draft Final Act, *supra* note 2. For an example of empirical application of tariffication, see Raboy & Simpson, *supra* note 3, at 276-79 (examining U.S., Argentine, and Chinese peanuts).

5. *See* U.S. INT'L TRADE COMM'N, PUB. NO. 1400, CONVERSION OF THE TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED INTO THE NOMENCLATURE STRUCTURE OF THE HARMONIZED SYSTEM 8 (1983) [hereinafter ITC TARIFF SCHEDULE CONVERSION]; *see also* Peggy Chaplin, *An Introduction to the Harmonized System*, 12 N.C. J. INT'L L. & COM. REG. 417, 432 (1987) (stating that this "proliferation" of tariffs hampered trade).

6. The tariffs on "import-sensitive" items will generally be above average. The U.S. tariff on many types of shoes, for example, is 37.5%. U.S. INT'L TRADE COMM'N, PUB. NO. 2690, HARMONIZED TARIFF SCHEDULE OF THE UNITED STATES 1994, at 64-6 [hereinafter 1994 HARMONIZED TARIFF SCHEDULE] (describing HS6402.91.50, "footwear . . . to be worn . . . as . . . protection").

Regardless of the motivation, a system that sets duties on imported items based on their category requires a mechanism by which those items can be placed in their appropriate classifications. Such determinations obviously have significant effects, not only for traders in imported goods (and their competitors), but also for the national fisc. A classification system must be fine enough to avoid grouping together goods that do not actually compete with each other, yet coarse enough to disallow the evasion of duties through commercially insignificant modifications to goods.

Customs classification soon veers into the metaphysical. Is it a carpet or an artwork? a toy or a model? a paperweight or a compass? an unfinished truck or a part of a truck?[7] Like scientific theories, classification schemes often start from simple matrices which gradually become complicated with interpretations by the courts and amendments by the legislature until they collapse of their own weight and require wholesale replacement. The lack of harmonization of tariff schedules, even at a fairly aggregate level, and the complex nature of country-specific tariff schedules produced problems with liberalization negotiations, data collection, and the performance of standard cross-border transactions.[8] These problems existed in several countries.[9]

In 1970, the European Commission proposed that the Brussels-based Customs Cooperation Council (CCC) be charged with devel-

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7. The Harmonized Tariff System sets out some rules of interpretation, but the courts have created others out of necessity. *See, e.g.*, W & J Sloane, Inc. v. United States, 76 Cust. Ct. 62 (1976) (holding a hand-carved wooden panel to be a wood screen, dutiable at a rate of 30-40%, and not a decorative object, dutiable at a rate of 13-17%).

8. These concerns were reflected in the ultimate Convention that produced the Harmonized Tariff System. The motivating factors of the contracting parties were the desire "to facilitate international trade, . . . to facilitate the collection, comparison and analysis of statistics, . . . [and] to reduce the expense incurred by redescribing, reclassifying and recoding goods as they move from one classification system to another." International Convention on the Harmonized Commodity Description and Coding System, *opened for signature* June 14, 1983, pmbl., 1989 Gr. Brit. T.S. No. 15 (Cmnd. 695) [hereinafter International Convention].

9. *See* MICHAEL LUX, THE HARMONIZED COMMODITY DESCRIPTION AND CODING SYSTEM: CURRENT SITUATION AND CONSIDERATION § 2.1.2 (1981). Lux states that until the end of World War II, most countries used their own coding systems, but that the Customs Cooperation Council successfully negotiated the standardization of tariff schedules for many countries during the following four decades. *Id.* "However, major trading partners such as the United States of America and Canada still use their own customs tariff nomenclature, and various eastern bloc countries (including the USSR, the People's Republic of China and the GDR) do not apply the [Customs Cooperation Council Nomenclature] system." *Id.* Lux also notes that a bloc of Central American countries used a different tariff classification system during this period. *Id.*

oping an international tariff classification system.[10] The Trade Act of 1974 required the United States to participate in the deliberations of the CCC.[11] The Harmonized Tariff System (HS) was developed between 1971 and 1983, and became law in the United States as part of the Omnibus Trade and Competitiveness Act of 1988.[12]

B. *The Harmonized System*

The CCC designed the Harmonized Tariff System to provide a single international mechanism to be used for tariff, statistical, and transportation documentation functions.[13] It is a "core" system which sets up a general six-digit method of classifying imported goods for these three functions, and which the contracting parties are obligated to use.[14] Individual countries are permitted, at their discretion, to disaggregate beyond the six-digit level.[15]

The HS includes ninety-six chapters, contained in twenty sections, that differentiate product groups.[16] The six-digit, internationally-bound classification contains the following information: the first two digits denote the chapter, the second two digits denote the heading, and the last two digits denote the subheading.[17] For example, the classification HS1006.10 refers to chapter 10, cereals; heading 06, rice; and subheading 10, rice in the husk.[18] The HS sections include such highly aggregated areas of economic activity as live animals and animal products, footwear, and vehicles.[19]

The HS is subject to a series of General Rules of Interpretation.[20] These govern, among other things, the classification of unfinished items, products involving mixtures or combinations of inputs, and

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10. Chaplin, *supra* note 5, at 423.

11. Trade Act of 1974, Pub. L. No. 93-618, § 608(c)(2), 88 Stat. 1978, 2074 (1975); *see also* Robert S. Rendell, *Report on the Harmonized Commodity Description and Coding System*, 22 INT'L LAW. 242, 242 (1988).

12. Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, §§ 1201-1217, 102 Stat. 1107, 1147-63 (to be codified at 19 U.S.C. §§ 3001-3012); *see also* Stewart A. Baker & Shelly P. Battram, *The Canada-United States Free Trade Agreement*, 23 INT'L LAW. 37, 39 n.6 (1989) (describing the history and function of the Harmonized Tariff System).

13. Chaplin, *supra* note 5, at 418 & n.10 (citing Rosengarden & Murphy, *Commodity Classification Goes International*, BRANDON'S SHIPPER & FORWARDER 29 (Sept. 30, 1985)).

14. ITC TARIFF SCHEDULE CONVERSION, *supra* note 5, at 15; Chaplin, *supra* note 5, at 423 & n.55.

15. Chaplin, *supra* note 5, at 423 & n.56 (citing ITC TARIFF SCHEDULE CONVERSION, *supra* note 5, at 15).

16. ITC TARIFF SCHEDULE CONVERSION, *supra* note 5, at 16.

17. *Id.*

18. 1994 HARMONIZED TARIFF SCHEDULE, *supra* note 6, at 10-2.

19. Chaplin, *supra* note 5, at 426.

20. 1994 HARMONIZED TARIFF SCHEDULE, *supra* note 6, at 38.

products which are complementary to other goods, such as camera cases and jewelry boxes.[21] The General Rules of Interpretation are very broad and are not based upon such economic concepts as effective competition or classification by use. It is open to HS users, however, to fine-tune the system. The real use of goods is very much a part of the Additional U.S. Rules of Interpretation.[22] Under the Additional U.S. Rules:

> [A] tariff classification controlled by use (other than actual use) is to be determined in accordance with the use in the United States at, or immediately prior to, the date of importation, of goods of that class or kind to which the imported goods belong, and the controlling use is the principal use.[23]

"Principal use" is defined as "that which exceeds any other single use."[24]

C. *Problems with the System*

By definition, the HS must apply at a fairly broad level of product aggregation since countries are only bound at the six-digit level.[25] The adoption of such a system clearly enhances the ability of countries to collect data and provides businesses with a greater level of information with which to perform normal trade transactions.[26] As a result, exporters and importers face less uncertainty under the HS regarding the categorization of goods and the levels of duties facing those goods than under a regime utilizing a wide variety of methodologies.[27]

In many cases, however, tariffs are determined at levels of disaggregation beyond the internationally-bound six-digit level.[28] Entire markets or industries can be contained in subdivisions of a six-digit HS class.[29] At this level, where details are extremely crucial, the HS

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21. *Id.*
22. *Id.* at 39.
23. *Id.*
24. ITC TARIFF SCHEDULE CONVERSION, *supra* note 5, at 34.
25. However, countries can still further subdivide with additional digits at their discretion. *See supra* note 15 and accompanying text.
26. The Convention proclaims these goals, among others, as the reasons for the participation of the contracting parties. International Convention, *supra* note 8, pmbl.
27. Chaplin, *supra* note 5, at 431.
28. For example, in the case of rice imported into the EC, there are three separate tariffs that apply to the single six-digit category for "semi-milled or wholly milled rice," HS1006.30. *See infra* notes 95-103 and accompanying text.
29. For instance, HS4403.10, "[w]ood in the rough, whether or not stripped of bark or sapwood, or roughly squared: [t]reated with paint, stain, creosote or other preservatives," includes two separate markets under further U.S. disaggregation: "[t]elephone, telegraph and electrical power poles" (HS4403.10.20) and "[f]ence posts" (HS4403.10.40). 1994 HAR-

is powerless to prevent many unintentional or intentional problems.[30] Interpretation by exporters or customs agents could become as much of a problem as in the pre-HS period as countries add digits beyond the six-digit level. Equally problematic, however, is the possibility that *not enough* disaggregation in tariff classes will occur. Products that do not in fact compete against one another might be lumped together in the same tariff class.

A classification system will be successful to the degree that it groups similar products together and prevents the grouping of commercially dissimilar items—this is the implicit objective of the HS.[31] Categories should be established according to economic principles. This requires decisions based on perceptions of competition in the real marketplace.[32] Once the categories are determined, the system is implemented in a legal framework,[33] permitting appeals to fairness and consistency, justice and equity. To use Dworkin's famous dichotomy, the establishment of a classification system is a classic matter of policy; its application to specific cases is a question of principle.[34]

In the United States, HS proponents announced that the intention of the HS was to ground policy decisions in good economics and in consideration of the foreign policy objectives of the country.[35] This has led to an effort to avoid unnecessary classification of

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MONIZED TARIFF SCHEDULE, *supra* note 6, at 44-3. The markets are distinguished since, in most cases, fence posts are not substitutable with telephone poles and vice versa. Similarly, HS8422.30 includes "[m]achinery for filling, closing, sealing, capsuling or labeling bottles, cans, boxes, bags or other containers; machinery for aerating beverages." *Id.* at 84-23. Can-sealing machines, labeling machines, and machines for aerating beverages are clearly not interchangeable in consumption or production, and are thus further disaggregated under the U.S. system. *Id.*

30. One unintentional problem might be confusion over the classification of a product. An intentional problem might occur when a product is subject to a high tariff despite evidence that the product is misclassified and would be subject to a lower tariff under the correct classification. The EC rice CAP is but one example.

31. International Convention, *supra* note 8, pmbl.

32. "Among other things, the proposals are intended to assure that the U.S. contribution to this Convention recognizes the needs of the U.S. business community for a trade nomenclature reflecting sound principles of commodity identification, modern production methods, and current trading patterns and practices." U.S. Participation in the Harmonized System Committee of the Customs Cooperation Council, 53 Fed. Reg. 45,646, 45,647 (1988).

33. There is an appeals process provided by the HS to aid in the settlement of disputes. International Convention, *supra* note 8, art. 10. However, there is no appeals process at levels of disaggregation beyond six digits; in practice, redress is only found in bilateral or multilateral trade negotiations.

34. RONALD DWORKIN, TAKING RIGHTS SERIOUSLY 134-37 (1977).

35. Former President Ronald Reagan believed that "the use of the Harmonized System by all countries for customs tariff and international trade statistical reporting could

foreign products, especially the products of developing countries, into categories deemed "import-sensitive." Such a classification would subject these goods to higher rates of duty.

The consequences to world trade from misclassification at category levels outside the purview of the HS are by no means trivial. These effects, however, can be reduced by a scientific method for defining markets. Such a mechanism—already in use in such legal realms as antitrust[36] and antidumping law[37]—would determine whether product X and product Y should be treated alike for tariff purposes on the basis of actual competition between these two products for a real consumer's dollar. Even if such an empirical analysis can never be rendered wholly objective and value-free, a systematic approach is more likely to eliminate prejudice and guesswork, increase efficiency, and further the goals for which the tariff system was adopted in the first place.

In the evolutionary process of trade harmonization, the next step beyond adoption of the HS would be for countries to more intensively apply market-oriented tools for determining and establishing tariff classifications. Concepts such as "effective competition," "relevant product markets," and "industries" should influence classification procedures if our goal is to prevent noncompeting goods from being subject to the same tariffs.

This Article presents an example of a major component of international trade that has been severely inhibited by improper product classification at the sub-six-digit level. It discusses the extent to which the European Community's Common Agricultural Policy (CAP) on a single commodity—rice—at its very core rejects this market analysis. To the extent that the rice CAP has consistently grouped products on grounds other than market realities, it has spawned an anomaly. The rice CAP provides a case study on how a system of tariff classification should *not* be set up. Section II discusses the concept of effective competition—its theoretical and empirical content, its relevance to other areas of law, and its poten-

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result in major benefits both to the United States and our trading partners." Letter from Ronald Reagan requesting that the U.S. International Trade Commission institute an investigation under the Tariff Act of 1930 to provide a basis for the conversion of existing tariff schedules to the nomenclature of the HS (Aug. 24, 1981), *reprinted in* 46 Fed. Reg. 47,897 (1981). "The Senate amendment makes Congressional findings that establishment of a uniform international tariff classification system will be of significant U.S. benefit . . . ." H.R. CONF. REP. No. 576, 100th Cong., 2d Sess. 547 (1988), *reprinted in* 1989 U.S.C.C.A.N. 1547, 1580.

36. *See infra* notes 58-62 and accompanying text.

37. *See infra* notes 63-72 and accompanying text.

tial application to tariff classifications. Section III provides a description of the EC rice CAP, the associated variable import levies, and the relevant tariff classifications. Sections IV and V describe the EC rice market and provide the results of empirical tests used to classify effective competitors properly in that market. Section VI offers conclusions based on these tests.

II. Effective Competition

A. *Overview*

Under some circumstances, a tariff serves as a low-level source of government revenue or as a user fee to cover the costs of administering international trade.[38] More frequently, however, the purpose of the tariff is simply to protect domestic products from competing imports. It is this use that raises global ire, and is the subject of seemingly everlasting trade negotiations.[39] Because of the considerable friction caused by protective tariffs, countries should at the least construct tariffs that are *efficient.* Efficient tariffs apply only to truly competing goods and not to goods that do not threaten domestic production. The notion of effective competition is essential in the construction of an efficient tariff system. Such a concept is well-founded in both economic theory and practical law and economics applications.[40]

The concept of effectively competing products has its basis in microeconomic theory, particularly under the subheadings "market" or "industry."[41] Markets or industries are comprised of competing products, or of firms with facilities that can easily adjust to produce competing products. For instance, a standard graduate-level microeconomic text defines an industry as follows:

> Two criteria are commonly used for the definition of an industry, *the product* being produced (market criterion), and *the methods of production* (technological criterion). According to the first criterion firms are grouped in an industry if their products are close substitutes. According to the second criterion firms

38. Some low, standard levels of tariffs, for instance, go into a country's general revenues, and are applicable to all imports.

39. The just-completed Uruguay Round of GATT negotiations and the long consideration of the North American Free Trade Agreement are prime examples of efforts to lower tariff and non-tariff barriers. The GATT negotiations, which lasted seven years, ended on December 15, 1993, with the approval of the trade pact. Peter Behr, *117 Nations' Representatives Approve Historic Trade Pact*, Wash. Post, Dec. 16, 1993, at A41.

40. *See infra* notes 54-73 and accompanying text.

41. *See, e.g.*, A. Koutsoyiannis, Modern Microeconomics 8 (2d ed. 1979).

> are grouped in an industry on the basis of similarity of processes and/or of raw materials being used.[42]

For tariff classification purposes, the market method is more relevant.[43] The market would include all of the products that are reasonable substitutes for the product being classified.[44] Such substitutes encroach on the market shares of domestic products. Products that cannot supplant indigenous production in the eyes of consumers are not a threat to domestic producers, and thus should not be subject to the same tariffs as products that will substitute for, and therefore threaten, domestic goods.[45] The key to an efficient tariff system is the ability to easily classify the range of products that are reasonable substitutes for the relevant domestic products. Here the emphasis is on "reasonable." Policymakers may choose to buy political insurance against their more vocal protectionist lobbies by broadly defining "reasonable substitutes." Nonetheless, some empirically and theoretically based categorization is necessary. This Article suggests a technique that would allow the broadest latitude for policymakers.

B. *Substitutes and Price Effects*

1. The Concept of Substitutability

The basis for any discussion of putative competitors is the mutual interaction of prices and quantities. In general, goods can be classified into three categories: goods that are substitutes for each other, goods that are complements, and goods that are unrelated.[46] The standard empirical technique to determine substitutability requires the construction of an econometric model representing general demand conditions.[47] The most formal test

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42. *Id.*

43. The market method identifies products that are substitutable in consumption or that compete in the marketplace. Products, rather than companies, are the subject of tariff classification.

44. *Id.* This is the standard market definition.

45. This, of course, is only relevant if the purpose of the tariff is protection of domestic producers.

46. *See, e.g.*, JAMES M. HENDERSON & RICHARD E. QUANDT, MICROECONOMIC THEORY: A MATHEMATICAL APPROACH 37 (2d ed. 1971).

47. Out of such a model, the own-price and cross-price elasticities of demand can be calculated for goods hypothesized to be competitors. For a good description of modern consumer demand theory and calculation of these elasticities, see ANGUS DEATON & JOHN MUELLBAUER, ECONOMICS AND CONSUMER BEHAVIOR 1-115 (1980). The own-price elasticity measures the percentage change in the quantity demanded of a good, due to a one-percent change in the price of that good. HENDERSON & QUANDT, *supra* note 46, at 27-28. The cross-price elasticity measures the percentage change in the demand for a good, due to a one-percent change in the price of another good. *Id.* If the measured cross-price elasticity

for effective competition among goods would call for the construction of a model based on the econometric Almost Ideal Demand System, for example, and the subsequent calculation of cross-elasticities.[48] If statistically significant, positive cross-elasticities of demand are discovered in the demand analysis, an analyst can then conclude that the relevant goods are substitutes for one another and should be treated as occupying a single product market.

Such a procedure is necessary to determine conclusively that goods *are* substitutes. If the goal is merely to eliminate goods that are obviously *not* substitutes, then interim tests can be employed. These tests involve observing the behavior of prices (but not quantities) of putative substitutes.[49] The prices of goods in competition will be statistically related, and in the case of perfect substitutes, highly correlated.[50] A statistical relationship between the prices of putative substitutes, while necessary, is not a sufficient condition for competition.[51] If the prices (and price fluctuations) of two items are statistically and positively related, then the possibility that the goods compete cannot be rejected. Other tests are necessary, however, before we can conclude that the goods are in fact substitutable in consumption.[52] But the casting out of non-competitors may be all that is required by policymakers for a system that is economically sound, legally applicable, and politically defensible.

This Article attempts to provide a mode of analysis that is first and foremost workable. Any classification mechanism that becomes overly mired in details will collapse of its own weight. However, a simple comparison of the motion of prices of putative competitors is something that policymakers can add to their arse-

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is positive (that is, as one good's price increases, consumers purchase more of another good), then the two goods are substitutes. WALTER NICHOLSON, MICROECONOMIC THEORY 108 (2d ed. 1978). If the cross-price elasticity is negative, then the goods are complements. *Id.* If the cross-price elasticity is statistically zero, then the goods are unrelated.

48. The Almost Ideal Demand System has evolved as one of the econometric demand models most consistent with basic microeconomic demand theory. For a description of this model, see DEATON & MUELLBAUER, *supra* note 47, at 75-78.

49. *See infra* notes 154-157 and accompanying text.

50. This follows directly from the economics of substitution. *See generally* DEATON & MUELLBAUER, *supra* note 47; HENDERSON & QUANDT, *supra* note 46; Todd E. Petzel & Eric A. Monke, *The Integration of the International Rice Market*, 17 FOOD RES. INST. STUD. 307, 308-09 (1979-1980).

51. There is always the possibility that correlations are spurious, with no implied causality. Bad weather could affect the prices of wheat and apples similarly so that their prices correlate, but that is not sufficient to conclude that the two commodities compete in the marketplace. On the other hand, true competitors will have highly correlated prices. Thus, a correlation of prices is a necessary condition for competitors, but is not, in and of itself, conclusive.

52. RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 48-49 (1976).

nal of classification weapons. This provides a filter capable of screening out products that obviously are not competitors with domestic goods. The tests suggested here will give policymakers the broadest possible latitude in aggregating products for tariff purposes, without requiring a rigid, and probably irrelevant, "market" test.[53] The broadest application would focus only on the previously mentioned "necessary conditions," while not requiring that the "sufficient conditions" be satisfied. These tests provide a minimum threshold for declaring putative competitors "suspects." All that is required is that the prices of imports be in some significant way statistically linked to the prices of the domestic products with which they are allegedly competing. If such a relationship exists, then the inclusion of imports in a tariff class that protects the relevant domestic product can be defended under the broad rules of the procedure suggested in this Article.

2. Price Behavior of Competing Products

When products are competing against one another, the movement of their prices is related. In the limiting case, where two products are virtually identical, prices will be identical in the same geographic market. Over time the prices will be highly correlated because the ease of substitution by purchasers disciplines the price structure. If the price of one product substantially increases, consumers will immediately switch to the lower-priced perfect substitute.[54] This occurs whether the market is a spot market or one characterized by forward contracting. In both cases, the ability to profit from arbitrage dictates that there can be only one price in the same market at one time for identical products from different sources.

In other cases, some products are of higher quality than others in the same basic category. Prices in these instances will still be expected to move together, although the higher-quality goods will sell at a predictable premium.[55] The prices will be highly correlated but with a systematic price gap between the higher-quality and lower-quality varieties.

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53. That is, we do not conclude that a tariff class should be equivalent to the antitrust definition of a "relevant product market" as, say, in the Justice Department Guidelines. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines, 57 Fed. Reg. 41,552, 41,554 (1992) [hereinafter Justice Department Guidelines].

54. This is the definition of a high cross-price elasticity of demand. *See* HENDERSON & QUANDT, *supra* note 46, at 27; NICHOLSON, *supra* note 47, at 108.

55. *See* Benjamin Klein & Keith B. Leffler, *The Role of Market Forces in Assuring Contractual Performance*, 89 J. POL. ECON. 615, 618-20 (1981).

It would be incorrect, however, to assume that a lack of *perfect* correlation means that two goods do not compete.[56] Products can be imperfect substitutes when changes in the price of one item will result in a switch to another item despite the lack of precise conformity between them.[57] A much broader and more conclusive analysis requires the use of econometric methods to test whether there are *any* statistically significant positive relationships among the prices of allegedly competing goods. If two varieties are imperfect substitutes and have prices that are not highly correlated, there may still be some significant relationship between their prices. The price of one will be able to be statistically expressed as a function of the other. The tests developed below are based on this minimum statistical relationship.

C. *Other Law and Economics Applications*

The use of market definitions and the concept of effective competition have had broad law and economics applications in areas such as antitrust, not to mention U.S. trade law.[58] In the antitrust field, the concept of a relevant product market is crucial to judgments relating to horizontal mergers.

Practical economic techniques are no stranger to antitrust analysis. For instance, Judge Richard Posner has written on antitrust proceedings,[59] especially with regard to application of the Sherman Act to mergers:

> If we ask *why* a slight increase in the price of a product might result in a substantial drop in the quantity demanded from the sellers—why, in other words, demand is elastic at the current price—two possibilities come to mind. The first is that the product has good substitutes at that price, so that even a slight increase in price would deflect many consumers to them. The second possibility is that the makers of some other product (which need not be a good substitute in consumption) can readily switch to producing this product and would do so if its price rose any further, because at the new price they could earn a higher return by making this product instead of whatever they are making now. In short, the ability of a group of sellers to collude is limited by the existence of sellers of products that are good substitutes either in consumption or in production . . . .[60]

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56. *See* Petzel & Monke, *supra* note 50, at 309.
57. This is the root definition of imperfect substitutes.
58. *See infra* notes 59-72 and accompanying text.
59. *See generally* POSNER, *supra* note 52.
60. *Id.* at 126.

Such concepts as markets, effective competition, and substitution in production and consumption have been featured prominently in U.S. court cases[61] and in the Department of Justice's Merger Guidelines.[62]

These concepts also play a role in U.S. trade law. The United States International Trade Commission (ITC) hears complaints under, among other legislative provisions, section 201 of the Trade Act of 1974[63] and section 337 of the Tariff Act of 1930[64] concerning levels of imports deemed injurious to domestic industries, or allegations of unfair trade practices that damage those domestic industries. The appropriate question in a section 337 analysis, for example, is not whether a particular company has been damaged, but whether the "industry" has suffered damage.[65] The definition of an industry is vital to ITC decisions, and ITC precedents closely follow the economic definition of industry cited earlier.[66] Both market and technological criteria are considered. The domestic industry, in general, "includes all domestic producers of an article that is 'like or directly competitive' with the imported article."[67]

An example of employing substitutability in demand as a criterion is found in the well-known case involving wood shakes and shingles.[68] The ITC found that the two items are to a large extent interchangeable based on desired appearance and the fact that both serve fundamentally the same purpose; they were therefore held to be competitors in a single industry.[69] Another typical section 337 deliberation considered substitutability in both supply and

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61. *See, e.g.*, United States v. Grinnell Corp., 384 U.S. 563, 574 (1966) (analyzing the relevant market in the fire and burglar-alarm industry); United States v. E.I. du Pont de Nemours & Co., 351 U.S. 377, 404 (1956) (discussing the "market" one must study to determine the existence of a monopoly); Telex Corp. v. International Business Machines Corp., 510 F.2d 894, 915-19 (10th Cir. 1975) (defining the relevant market in an antitrust suit).

62. *See* Justice Department Guidelines, *supra* note 53.

63. Trade Act of 1974, Pub. L. No. 93-618, § 201, 88 Stat. 1978, 2011 (codified at 19 U.S.C. § 2251 (1988)).

64. Tariff Act of 1930, ch. 497, § 337, 46 Stat. 590, 703 (codified as amended at 19 U.S.C. § 1337 (1988)).

65. *See In re* Certain Alkaline Batteries, USITC Pub. 1616, Inv. No. 337-TA-165, 6 Int'l Trade Rep. (BNA) 1849, 1865 (Nov. 1984).

66. *See supra* notes 41-42 and accompanying text.

67. Birch Plywood Door Skins, USITC Pub. 743, Inv. No. TA-201-1, 1 Int'l Trade Rep. (BNA) 5121, 5131 (Oct. 20, 1975); *see also* Certain Motor Vehicles and Certain Chassis and Bodies Therefor, USITC Pub. 1110, Inv. No. TA-201-44, 2 Int'l Trade Rep. (BNA) 5241, 5261 (Dec. 1980) (employing a similar definition).

68. Wood Shakes and Shingles, USITC Pub. 1826, Inv. No. TA-201-56, 8 Int'l Trade Rep. (BNA) 2135 (Mar. 1986).

69. *Id.* at 2138.

demand when determining the relevant industry for point screws for drywall construction.[70] The ITC held that the relevant industry definition was a narrow and specific one; it was limited to drywall screws and did not include all screws because the production facilities of the complainant were segregated according to the use of its screws, and because drywall screw producers could not easily divert facilities to the production of screws for other uses.[71] In a case involving tubeless tire valves, the ITC relied on demand-side substitutability, ruling that "snap-in" and "clamp-on" tubeless tire valves are part of the same industry because the two products are made from the same materials and have the same components and appearance.[72]

The use of the economic concepts of competition and markets in antitrust and U.S. trade law illustrates that the melding of law and economics disciplines has practical application. This same marriage can exist in the classification of products for tariff purposes.

D. *Applications to Tariff Classifications*

This Article does not conclude that rigid economic tests can or should be codified either in international treaties concerning tariff class harmonization or, for that matter, in domestic legislation or rules of interpretation. Nor are the concepts of "market" or "industry" the proper levels of aggregation for workable tariff categories. In many cases, individual tariffs will apply to a class of goods that is a subset of that which is offered in a market or produced in an industry.[73] Within tariff classifications, however, economic measures of effective competition are important when an individual country attempts to structure an efficient tariff system. At the least, these tests should be deployed to ensure that goods that do not compete with domestic products are not subject to the same tariffs as goods that do.

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70. *In re* Certain Drill Point Screws, USITC Pub. 1365, Inv. No. 337-TA-116, 5 Int'l Trade Rep. (BNA) 1185 (Mar. 3, 1983).

71. *Id.* at 1189-91.

72. Tubeless Tire Valves, USITC Pub. 1286, Inv. No. TA-201-46, 4 Int'l Trade Rep. (BNA) 1986, 1987 (Sept. 29, 1982).

73. There are numerous instances of substantially similar goods being subject to different tariff rates. For example, in the United States, hedge shears, two-handed pruning shears, and similar two-handed shears each face a duty of one cent per unit plus 2.8% *ad valorem*. Grass shears, however, face a specific tariff of two cents per unit plus 5.1% *ad valorem*. 1994 HARMONIZED TARIFF SCHEDULE, *supra* note 6, at 82-2.

III. The EC Rice CAP and Levy System

A. *Introduction*

The variable import levy system that applies to rice imported into the EC is a glaring example of a case where failure to use these market-related tests has subjected an important component of trade to punitive tariffs[74]—and therefore subjected consumers to unnecessarily high prices or restricted choices[75]—without any concurrent benefit to the EC rice producers that the tariffs were apparently designed to protect.

The fundamental principles of the EC's Common Agricultural Policy were stated in the Treaty of Rome, which functions as the constitution of the European Community.[76] According to the Treaty, the objectives of the CAP are increased agricultural productivity, a guaranteed "fair standard of living" for the farming sector, stabilized markets, assured availability of supplies, and "reasonable prices" for consumers.[77]

In its pursuit of these goals, the Community instituted an elaborate structure with respect to the several CAP commodities, including rice.[78] The essential features of the CAP are: (1) an intervention system, whereby Community institutions act as purchasers of last resort whenever market prices fall below a predetermined level;[79] (2) a system of fluctuating import duties called variable levies, theoretically constructed to ensure that imports are never offered for sale at prices lower than intervention levels for the same product;[80] (3) a mechanism for export subsidies called export refunds, designed to make high-priced EC production competitive on the world market;[81] and (4) a resulting "Community

74. The variable import levies in the EC have been on the order of 600 to 700 European Currency Units (ECUs) for long-grain rice imports. This is over 200% of the c.i.f. import price. *See infra* note 101, tbl. 1.

75. The tariff on long-grain rice raises the price of rice and restricts the quantities available for consumption. *See, e.g.*, James D. Gwartney & Richard L. Stroup, Economics: Private and Public Choice 776 (5th ed. 1990) (stating that tariffs result in higher prices and a lower level of domestic consumption).

76. Treaty Establishing the European Economic Community, Mar. 25, 1957, arts. 38-47, 298 U.N.T.S. 11, 30-36 [hereinafter Treaty of Rome].

77. *Id.* art. 39, 298 U.N.T.S. at 30-31.

78. Council Regulation 1418/76 on the Common Organization of the Market in Rice, 1976 O.J. (L 166) 1 [hereinafter Council Regulation] (implementing the provisions of articles 42-43 of the Treaty of Rome).

79. *Id.* arts. 4-5, at 3-4.

80. *Id.* arts. 11-12, at 5-6.

81. Article 17(1) states: "To the extent necessary to enable the products listed in Article 1 [rice] to be exported . . . on the basis of quotations or prices for those products on the

preference" by which, in normal market conditions, Community products will be consumed before there is a need to import those products in significant quantities.[82]

B. *The Variable Levy Calculation*

The keystone of the CAP is the variable levy.[83] It is the result of a calculus that pretends to scientific precision but is actually loaded with purely protectionist features.

What follows is a description of the elements and procedure, first placed in service in 1976, of the calculation of the variable import levy for rice. To make the calculation intelligible, we will follow a hypothetical ton of rice through the process.

1. The Intervention Price

The intervention price is set periodically by the European Commission based on farm-gate prices for husked rice at Vercelli, Italy, and Arles, France.[84] It is the price at which Community institutions will purchase all rice on offer if the producer cannot sell it.[85]

2. The Husking Allowance

Because the intervention price is based on paddy rice (rice as it is harvested), the notional ton of rice must be husked. Thus, the cost of husking as a processing cost is added to the intervention price.[86]

3. The Marketing Component

The preamble to this regulation anticipates that importers of rice will have incurred other costs in bringing it to market, such as storage costs, interest charges for storing the rice, and costs from "ensur[ing] that the disposal of [rice] stocks conforms to market

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world market, the difference between those quotations or prices and prices in the Community may be covered by an export refund." *Id.* art. 17(1), at 7.

82. The preamble to the Council Regulation states that the export refund "should be fixed in such a way that operations under inward processing arrangements do not lead the Community processing industry to use, with a view to export, basic products imported from third countries in preference to Community basic products." *Id.* at 2.

83. "[T]he price of imported products must be equated by means of a variable import levy." *Id.* at 1.

84. *Id.* art. 4(3), at 3-4.

85. *Id.* art. 5(1), at 4.

86. *Id.* art. 4(3), at 3-4.

requirements."[87] These factors represent a marketing component that is added to the intervention price.

4. "Inland" Transportation Costs

Once the husking allowance and the marketing costs are applied to a ton of rice purchased for the intervention price, we have notionally produced a ton of husked, marketable rice at Vercelli. The rice must now be transported from where it was grown to where it is to be consumed. The principal "deficit area" for rice is Duisburg, Germany.[88]

5. Target Price

Next, our ton of rice will theoretically be offered for sale at the target price at the market in Duisburg, Germany. The target price represents the intervention price increased by the three factors mentioned above: the husking allowance, marketing costs, and transport costs from the surplus area to the deficit area.[89]

6. "Outbound" Transportation Costs

Rice is not imported at Duisburg, however, because it is a land-locked city; rice is imported at Rotterdam.[90] Imported rice must be transported to where it will be purchased and consumed. We therefore must consider the cost of transportation between Rotterdam and Duisburg.

7. Threshold Price

All things being equal, the target price less outbound transportation costs—the threshold price—is the standard against which imports are measured under the rice CAP.[91] That is, imported rice on offer at Rotterdam for less than the threshold price would undersell domestic rice at its lowest possible price (i.e., at intervention levels).

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87. *Id.* at 1.

88. AGRA EUROPE, CAP MONITOR—RICE 10B.3(9), at 2 (Sept. 22, 1992) [hereinafter CAP MONITOR] (on file with *The George Washington Journal of International Law and Economics*).

89. *Id.*

90. *Id.* 10B.3(11), at 2.

91. Council Regulation, *supra* note 78, art. 14(2)-(3), at 6-7 ("The threshold price . . . shall be derived . . . by making adjustments by reference to the conversion costs, processing costs and the value of by-products and then by adding an amount for the protection of the industry.").

8. C.i.f. Offer Price

Public information exists on the prices of rice imported to Rotterdam from overseas. For Rotterdam, c.i.f. prices "shall be calculated . . . on the basis of the most favourable purchasing opportunities on the world market, taking into account . . . the quotations or prices on that market adjusted by reference to any differences in quality compared with the standard quality."[92]

9. External Corrective Amount

Rice qualities vary widely, and consumers regularly pay a premium for better-quality rice. Again, to assure that like is compared with like, c.i.f. offer prices at Rotterdam are adjusted to account for alleged quality differences.[93]

10. Variable Levy

The variable levy is the difference between the threshold price (i.e., the price at which our notional ton of intervention rice is offered at Rotterdam) and the quality-adjusted c.i.f. offer price for foreign rice.[94] This levy is effectively the import duty payable on every ton of foreign rice brought into the Community.

C. *EC Tariff Classifications for Milled Rice*

As expected, milled rice in the EC is contained in the same six-digit tariff class as milled rice in the United States—HS1006.30, "semi-milled or wholly milled rice, whether or not polished or glazed."[95] This category is further subdivided, at the eight-digit level, to separate semi-milled and wholly milled rice.[96] Each of these subdivisions includes two classifications: parboiled and other rice.[97] The specific commodity on which this Article focuses is wholly milled, non-parboiled rice contained in categories HS1006.30.92 through HS1006.30.98. These groupings include "round-grain" rice (HS1006.30.92), "medium-grain" rice

92. *Id.* art. 16(2), at 7.

93. *Id.* art. 16(3), at 7 (providing that "[d]ifferences in quality shall be expressed by means of corrective amounts representing the differences in quality and in value between the variety taken as the standard quality and other varieties").

94. *Id.* art. 11(1), at 5. The variable levies for round-grain husked rice, long-grain husked rice, round-grain wholly milled rice, long-grain wholly milled rice, and broken rice are calculated by subtracting the c.i.f. prices for each respective rice from the threshold price for that rice. *Id.*

95. Commission Regulation 2505/92, 1992 O.J. (L 267) 93.

96. *Id.*

97. *Id.*

(HS1006.30.94), and "long-grain" rice (HS1006.30.96, HS1006.30.98).[98]

A separate variable import levy is calculated for each of the three broad tariff classifications: round, medium, and long-grain rice.[99] Yet the intervention, target, and basic husked threshold prices that are the origin of the levy calculations for *all* classes are based on *round-grain* EC rice, and are the same regardless of rice variety.[100] The threshold price for milled rice is increased by a conversion factor for milling, the net of processing costs and the value of by-products, and an amount to protect the milling industry. These factors and differences in the c.i.f. prices of different categories of milled imports produce different levels of import levies for the three basic categories. It must be stressed, however, that the variable levies for true long-grain imports are based on round-grain domestic prices. This makes sense only if the two commodities are competitors; if they are not, the system has generated an anomaly.

As will be discussed in detail in the next section, the long-grain variable import levy ostensibly was designed to protect Italian producers of "long-grain" rice. In fact, the Italian "long-grain" rice that is the basis of the import levy is more truly medium-grain rice. Therefore, the variable import levy for class HS1006.30.98 is entirely miscalculated. HS1006.30.98 should stand alone as a long-grain category, while HS1006.30.94 and HS1006.30.96 should be merged as a medium-grain category.

This is not merely a technical matter. The implications for trade in rice are enormous given the magnitude of the associated variable import levies.[101] The levies more than double the price of

98. *Id.* Broken rice, technically a category of wholly milled, non-parboiled rice, is classified under HS1006.40.00.

99. *Id.*

100. Originally there was a corrective amount that differentiated the intervention, target, and threshold prices of round-grain and long-grain rice. Council Regulation, *supra* note 78, art. 14(2)(b), (5)(a), at 6-7. This was repealed in 1980. Commission Regulation 2115/80, art. 1, 1980 O.J. (L 206) 10.

101. Table 1 compares the average c.i.f. prices of long-grain rice imports from Thailand and the United States with the levels of variable import levies for the period 1986 to 1988. Variable import levies have remained at levels over ECU 600 in the last few marketing years, more than doubling the price of imported long-grain rice.

long-grain imports[102] without generating any increased demand for domestic production.[103]

IV. The EC Rice Market

As discussed, the EC rice CAP defines the EC rice market as embracing three classifications of rice: long-grain, medium-grain, and round-grain.[104] Since virtually no medium-grain rice is imported,[105] the rice CAP implicitly assumes that there is competition between imports and domestic production in two basic commodities: round-grain rice and long-grain rice. The system also assumes that there is EC internal production of both items; accordingly, it assesses variable levies on both with quality adjustments that further increase the tariffs on round-grain and long-grain rices.[106] Can such a system survive employment of the economic tools described in Section II to critique the EC's product market segmentation, and to determine the bona fide competitors for EC rices?

Since most EC rice production occurs in Italy,[107] the varieties produced in that country form the domestic-product component of the empirical rice-market analysis. Italian rice is the basis for the target, intervention, and threshold prices that are the elements of the rice CAP, and which produce the variable import levy calculation.[108] This analysis utilizes milled EC rices and their putative

TABLE 1
(Amounts in ECU/Metric Ton)

	1986	1987	1988
C.i.f. Long-grain price	315	260	315
Variable Import Levy	669	687	630
Levy as a percent of c.i.f. price	212%	264%	200%

Sources: Weekly Rice Market News and the Official Journal of the European Communities.

102. *See id.*

103. The EC "long-grain" rice is not a substitute for true long-grain rice. Therefore, the demand for the EC rice is independent of the price of imported long-grain rice. Consumers do not take the price of true long-grain rice into account when deciding how much EC rice to purchase.

104. *See supra* notes 95-98 and accompanying text.

105. CAP Monitor, *supra* note 88, 10B.4(4), at 4.

106. *Id.*

107. Italy's annual rice production is estimated to be 1 million tons. Rice Council for Market Development, Evaluation of World Rice Varieties and Types 21 (1987).

108. *See supra* notes 84-94 and accompanying text.

competitors, primarily milled rice imports from the United States and Thailand.

The EC maintains that Italian rice, designated as "long-grain," competes against imported long-grain rice.[109] But such a position runs counter to rice classification mechanisms used throughout the world.[110] This analysis proposes an alternative to the EC category system, then performs empirical tests based on actual market behavior to determine the correct categorization.

The alternative hypothesis is the method used to categorize rice in the United States, where EC and imported rices are separated into three categories reflecting underlying cooking and usage characteristics.[111] The hypothesis to be tested is that this delineation represents the *actual* segmentation of effective competitors in the EC rice market. Various statistical methods are applied to determine the veracity of the hypothesis. These empirical tests allow identification of the actual competitors of EC rice variants.

A. *EC Rice CAP Classifications and the U.S. Methodology of Rice Classifications*

As previously discussed, the current EC rice CAP defines three separate categories of whole-grain milled rice that are subject to three different variable import levies. These categories are defined solely on the basis of size attributes.[112]

In the United States, rice is categorized to reflect cooking and usage properties, not just length.[113] The criteria for categorization include size and dimension properties, and chemical indexes that

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109. This is implicit in having only one tariff for both long-grain tariff categories. *See infra* note 112.

110. Italy and Spain have recently begun to produce "true" long-grain rice. Nonetheless, the variable levy calculations are still based on rice production that is not considered long-grain by international standards.

111. AGRICULTURAL RESEARCH SERV., U.S. DEP'T OF AGRIC., RICE IN THE UNITED STATES: VARIETIES AND PRODUCTION tbl. 6, at 39 (1973) [hereinafter USDA/ARS REPORT]; FEDERAL GRAIN INSPECTION SERV., U.S. DEP'T OF AGRIC., UNITED STATES STANDARDS FOR RICE (1989) (describing the methods used in the United States to categorize rice).

112. Round-grain rice has a length of up to 5.2 millimeters and a length-to-width ratio of less than 2. CAP MONITOR, *supra* note 88, app. 1, at 7. Medium-grain rice is between 5.2 and 6 millimeters and has a length-to-width ratio no greater than 3. *Id.* Long-grain rice has two subcategories. Both have lengths greater than 6 millimeters, but type "A" has a length-to-width ratio of between 2 and 3 while type "B" has a ratio of greater than 3. *Id.* A fourth category includes broken rice, defined as grain fragments not more than three-quarters of the average length of the whole grain. *Id.*

113. B.D. Webb, *Rice Quality and Grades, in* 2 BOR S. LUH, RICE UTILIZATION 89, 93 (2d ed. 1991).

correlate with product characteristics.[114] Long-grain U.S. rice is "dry and fluffy," while round-grain and medium-grain rice is "moist and chewy."[115] Long-grain rice originates from the "indica" strain, while round-grain and medium-grain rice derives from the separate "japonica" type.[116] The following empirical analysis will demonstrate that these different rice types have different uses with little substitutability across categories.

Physical and chemical characteristic criteria differentiate rices in different categories. These criteria are employed because they correlate strongly with the cooking and usage characteristics that define the rice categories. The first criterion is grain size.[117] Although the dimensions of U.S. rice correlate with certain cooking properties, this may not be true of rices from other parts of the world.[118] Therefore, a series of process and chemical tests can also be used to categorize rice by cooking characteristics. Two of these tests are amylose content and gelatinization temperature.[119]

Amylose is a type of starch. According to one expert, "amylose content is considered the single most important characteristic for predicting rice cooking and processing behavior."[120] True long-

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114. "Rice produced and marketed in the U.S. is of three grain (kernel) sizes and shapes . . . classed as long-, medium-, and short-grain types . . . . Historically, and now through planned breeding, each type is associated with specific cooking, eating, and processing characteristics and product uses." B.D. Webb et al., *Utilization Characteristics and Qualities of United States Rice*, 1985 IRRI SYMPOSIUM ON RICE GRAIN QUALITY AND MARKETING 25, 25-26 (1985).

115. Webb, *supra* note 113, at 93.

116. *See, e.g.*, Petzel & Monke, *supra* note 50, at 310.

117. "An important varietal characteristic is grain size and shape, which is one of the most stable properties of the variety. Consumers have definite preferences for milled rice size and shape, based on the cooked rice texture they prefer." Bienvenido O. Juliano, *Criteria and Tests for Rice Grain Qualities, in* RICE: CHEMISTRY AND TECHNOLOGY 443, 447 (Bienvenido O. Juliano ed., 2d ed. 1985). Thus, the cooking characteristics of rice types can be determined from the physical dimensions of the rice kernels. These dimensions include length, length-to-width ratio, and weight. Long-grain rice kernels are 6.61 to 7.5 millimeters in length, have length-to-width ratios of 3.1 and over, and weigh 15 to 20 milligrams. Webb, *supra* note 113, tbl. 5-2, at 97. Medium-grain rice kernels are 5.51 to 6.6 millimeters, have length-to-width ratios of 2.1 to 3, and weigh 17 to 24 milligrams. *Id.* Note that the EC "long-rice A" category would be included in this medium-grain group under the U.S. system. Short-grain kernels are up to 5.5 millimeters in length, have ratios of 2 and less, and weigh 20 to 24 milligrams. *Id.* Since there is overlap in weight, the length and length-to-width criteria are the defining elements.

118. *See* Webb, *supra* note 113, at 93.

119. *E.g.*, Juliano, *supra* note 117, at 469-75; *see also* USDA/ARS REPORT, *supra* note 111, at 43.

120. Webb, *supra* note 113, at 103.

grain rices have high amylose contents, while sticky short-grain and medium-grain rices are low in amylose.[121]

A second test measures the temperature at which a stated percentage of starch molecules becomes swollen or "gelatinized" as the rice is cooked. This happens at lower temperatures for sticky short-grain and medium-grain rice.[122]

Other tests can be used to categorize rice by cooking and usage properties as well.[123] However, the criteria of grain dimensions, amylose content, and gelatinization temperature are sufficient to categorize rices traded in the EC for purposes of the procedure suggested here.[124] These criteria are appropriate in developing a testable hypothesis of effective competition among rice types sold in the EC market.

B. *Rice Varieties Traded in the EC*

Sales of milled rice in the EC derive from internally produced rice, primarily from Italy and Spain,[125] and imports of various rice varieties.[126] Long-grain milled rice is imported in much greater quantities than round-grain equivalents.[127] Long-grain rice imported from outside the EC comes primarily from Thailand and the United States.[128] Accordingly, this analysis is limited to obser-

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121. The content of amylose in rice kernels indicates whether the rice will cook sticky or flaky:

> The amylose content of rice, particularly of long-grain types, has recently been associated with cooking quality. The investigations of Williams and others . . . showed that the long-grain domestic varieties known to cook dry and flaky usually had the highest amylose content; whereas the amylose contents of the short- and medium-grain varieties investigated were somewhat lower. The glutinous (waxy) varieties contain virtually no amylose.

USDA/ARS REPORT, *supra* note 111, at 43. Other sources confirm that "[m]ost hardness indexes are positively correlated with amylose content, whereas stickiness indexes are negatively correlated with amylose content." Juliano, *supra* note 117, at 469.

122. "The gelatinization temperature of rice is believed to be closely related to cooking quality. The amylograph studies showed that most short- and medium-grain varieties gelatinized at lower temperatures than did most of the long-grain varieties investigated." USDA/ARS REPORT, *supra* note 111, at 43.

123. *See, e.g., id.* (mentioning "starch-iodine-blue value" and "dilute alkali" tests); Webb, *supra* note 113, at 101-04 ("parboil-canning stability" test); *see also* Juliano, *supra* note 117, at 466-69 (describing specific testing methods).

124. Just as with the discussion of prices, the empirical analysis is structured to give the broadest latitude for identifying putative competitors.

125. *See* COMMISSION OF THE EUROPEAN COMMUNITIES, THE AGRICULTURAL SITUATION IN THE COMMUNITY: 1989 REPORT, at T/175 (1990).

126. *See generally* EUROSTAT, CROP PRODUCTION: QUARTERLY STATISTICS 1986-1988 (1989) (breaking down exports and imports by country).

127. *Id.*

128. *Id.*

vations with regard to internal Italian rice production and external U.S. and Thai indica shipments to the EC. The major products from these EC, Thai, and U.S. sources—the basis for the data set to be employed in the competitive analysis—are listed and for test purposes assigned to rice categories according to the U.S. method of categorization.[129] This provides the testable hypothesis of effectively competing rice groups for further empirical analysis.

The United States exports long-grain indica rice to the EC.[130] Other milled U.S. rice exports to Europe include lower grades of indica rice.[131] Because of the number of allowed broken kernels, these varieties are classified as mixed long/medium-grain, even though they derive from indica sources. All of the U.S. rice types included in the data set are classified by the EC system as long-grain and are subject to the long-grain variable import levy.

Several varieties of Thai rice are also exported to the EC. For Thai long-grain varieties, "good quality rice is defined as long (>7 mm), slender, translucent grain that produces a fluffy, tender cooked product."[132] Eight Thai rices, primarily long-grain under the U.S. classification system, are included in the data set.[133] As in

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129. *See supra* notes 111-122 and accompanying text.

130. Based on data for shipments into the port of Rotterdam, the highest-priced U.S. rice export is called Grade No. 2, 4% bags [broken kernels] (U.S. 2-4). *See, e.g.*, U.S. DEP'T OF AGRIC., 67 WEEKLY RICE MARKET NEWS (1986) [hereinafter WEEKLY RICE MARKET NEWS]. This rice is classified under the U.S. system as long-grain, with an average length-to-width ratio of 3.4 to 1. USDA/ARS REPORT, *supra* note 111, tbl. 6, at 39. The rice has a relatively high amylose content, up to 27%, *id.* tbl. 8, at 45, and an intermediate gelatinization temperature (69-73C), Webb, *supra* note 113, at 103. The associated physical and chemical properties of U.S. imports result in kernels that "cook dry and fluffy, and the cooked grains tend to remain separate." Juliano, *supra* note 117, at 509.

131. For instance, these rice varieties include grade 3 with 10 or 15% broken kernels. *See generally* WEEKLY RICE MARKET NEWS, *supra* note 130.

132. Juliano, *supra* note 117, at 508-09.

133. Of the eight, only the main three would truly be classified as long-grain under the U.S. system. They are: SWR 100%, Grade A (Thai A); SWR 100%, Grade B (Thai B); and SWR 100%, Grade C (Thai C). WEEKLY RICE MARKET NEWS, *supra* note 130. Thai C, like the lower-grade U.S. rices, is classified as long/medium-grade due to broken-kernel content even though it is an indica rice. "Medium-grain" and "short-grain" Thai rices include Thai SWR in three varieties: 5, 10, and 15% broken kernels; SWR Brokens A-1 Super (Thai Super); and SWR Brokens A-1 Super Extra (Thai Super Extra). *Id.* Thai SWR 15% brokens, Thai Super, and Thai Super Extra could conceivably be classified as short-grain under the U.S. system, based solely on kernel size, while the other varieties are a short-grain/medium-grain mix. Thai Super and Thai Super Extra are technically "broken rices," and would most likely be classified as "second head" milled rice in the United States. All of the Thai rices are of the indica variant. The long-grain varieties have length-to-width ratios of 3.3 and above, and high amylose contents (about 23-24%). Gelatinization temperatures are intermediate. Data were not available on the amylose content or gelatinization temperature of the Thai "medium-grain" and "short-grain" rices. RICE COUNCIL FOR MARKET DEVELOPMENT, *supra* note 107, at 114-18.

the case of the U.S. product, if tariff categories were based solely on kernel size, some inferior varieties of rice might be classified as medium-grain or short-grain. But the EC rice CAP classifies virtually all Thai rice as long-grain, regardless of kernel size.[134]

Italy is the dominant rice producer in the EC.[135] By Community classification systems, Italy produces long-grain, medium-grain, and round-grain rice.[136] Experts from various sources have concluded, however, that the putative long-grain rice that is the basis of the variable import levy lacks the physical, cooking, and usage qualities that differentiate long-grain rice in the United States and Thailand, and that this "long-grain" rice should instead be classified as medium-grain rice. One expert, Bienvenido Juliano, concludes:

> The European rices are mainly short- and medium-grain japonica varieties with low to intermediate amylose content . . . . Most of the Italian rices also have soft to medium gel consistency . . . . Rice is prepared mainly as risotto with added vegetables such as mushrooms, spices, or meats, and is served just like pasta.[137]

Two other researchers, Todd Petzel and Eric Monke, note that "Italy, Taiwan, and Japan are predominantly round-grain producers."[138] The Rice Council for Market Development, an association of U.S. rice producers that conducts research on rice technology, trade, and other matters, recently carried out an analysis of the physical and chemical properties of rices around the world.[139] EC "long-grain" rices "were classed as medium grain by U.S. standards because of length to width ratio. All samples had amylose and protein content and gelatinization temperatures typical of U.S. medium or short grain varieties."[140]

Five Italian rice varieties are also included in the data set.[141] One variety is classified as round-grain (or short-grain) under both

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134. This includes not only Thai A, B, and C, but also Thai SWR 5, 10, and 15%. Thai Super and Thai Super Extra are sometimes classified as long-grain rice, while other times they are placed in the broken rice category. Telephone Interviews with Nick Oosterlinck, Consultant, EPRO S.A., Brussels, Belgium (Feb. 12, 18, and May 5, 1993).

135. RICE COUNCIL FOR MARKET DEVELOPMENT, *supra* note 107, at 21.

136. This is determined from classifications based on Agra Europe materials. CAP MONITOR, *supra* note 88, 10B.2-.3, app. 1, at 1-3, 7; *see also* RICE COUNCIL FOR MARKET DEVELOPMENT, EVALUATION OF WORLD RICE VARIETIES AND TYPES: UPDATE I 47, 48 (1989) [hereinafter RICE COUNCIL UPDATE I].

137. Juliano, *supra* note 117, at 511.

138. Petzel and Monke, *supra* note 50, at 310.

139. The Rice Council collaborated with the U.S. Department of Agriculture on this research. *See* RICE COUNCIL UPDATE I, *supra* note 136.

140. RICE COUNCIL FOR MARKET DEVELOPMENT, *supra* note 107, at 21.

141. The first is Balilla, classified as short-grain under the U.S. system and round-grain under the EC system. RICE COUNCIL UPDATE I, *supra* note 136, at 88. Kernels are about 3.1

the EC and the U.S. systems. One is classified as medium-grain under both systems. Three are classified as long-grain under the EC system, but would be medium-grain according to U.S. classification criteria. All of the Italian "long-grain" rices have cooking and usage properties that are distinct from those associated with true long-grain Thai and U.S. rice. There is no obvious substitutability between the indica rices of Thailand and the United States and the EC rices.[142] Although these three EC rices are classified as medium-grain under the U.S. system, they are nonetheless classified as long-grain in the EC and are protected by the high variable levies imposed on long-grain indica rice imports.

V. A Testable Hypothesis

Applying the cooking and usage properties inherent in the U.S. categorization system, all indigenous and traded rice varieties can be divided into three loose, *hypothetical* competitive categories. The long-grain category would include all high-grade Thai and U.S. varieties. The medium-grain category would include all of the EC medium-grain and so-called "long-grain" varieties, as well as some inferior grade Thai rices. The short-grain category would include round-grain EC rice and certain Thai broken rices.[143]

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millimeters, with a length-to-width ratio of 1.8. Rice Council for Market Development, *supra* note 107, at 80. Amylose content is about 21% and the gelatinization temperature is low. *Id.* Next is Lido, classified as medium-grain under both the EC and U.S. systems, with a length-to-width ratio of 2.6, amylose content of 17.6%, and a low gelatinization temperature. Rice Council Update I, *supra* note 136, at 47, 88. Lido has shorter kernels than the so-called "long-grain" varieties. *Id.*

In the data set are three rice types classified by the Europeans as long-grain: Arborio, Ribe-Ringo, and Roma. Although Arborio has kernels that are about 10 millimeters in length, the kernels are fat, so that the length-to-width ratio is only 2.1. *Id.* Further, the amylose content is very low, under 16%, and the gelatinization temperature is also low. *Id.* Thus Arborio will cook chewy and sticky, properties associated with medium-grain and short-grain rices. Similarly, Ribe has a length-to-width ratio of 2.5, a low amylose content of about 17%, and a low gelatinization temperature. *Id.*

142. The latter make good risotto, for example, but could not be used in curry. The former do not have the cohesion necessary for risotto.

143. The long-grain category would include U.S. 2-4, Thai A, Thai B, and Thai C. The medium-grain category would include Thai SWR 5 and 10% brokens, EC Lido, EC Arborio, EC Ribe, and EC Roma. The inclusion of the Thai rices in this category is somewhat arbitrary, and is based solely on size due to the lack of information on amylose content or gelatinization temperature. The short-grain category would consist of Thai SWR 15% brokens, Thai Super, Thai Super Extra, and EC Balilla. Again, the inclusion of the Thai varieties is based only on the size criterion. Some of the "short-grain" and "medium-grain" Thai varieties include large portions of broken kernels from indica origins, and are properly characterized as broken rice. They are listed in these categories to provide the widest latitude in testing for competitors for EC rice.

Monthly data are available reflecting the prices of imported milled rice entering the Dutch port of Rotterdam.[144] Equivalent wholesale prices have been calculated for all domestic rice and imports.[145] The data set covers the period from 1986 to 1988.[146] Two tests were performed on the data. The first observed the correlation of the prices of EC rice varieties and their putative competitors. The second tested for *any* positive statistical links that would be a prerequisite to concluding that any two of the rice varieties actually compete in the EC market.

A. *Rice Price Movement in the EC*

Varieties of different grades of U.S. long-grain rice are highly correlated with each other, as are Thai long-grain rice types.[147] It should be noted that all Thai prices are also somewhat correlated with each other, regardless of grain size, because of the basic underlying cost structure and the potential to substitute in production.[148] It has been stated that Thai rice production is substantially integrated.[149] Also, all of the Thai rices in the data set derive from indica sources.

The correlation in the prices of U.S. and Thai long-grain rice is less than perfect but nonetheless detectable,[150] as would be expected for imperfect substitutes. This can be contrasted with the price movement of U.S. long-grain rice and European rice considered "long-grain" in the EC's classification methodology. Appendix A compares the price motion of U.S. long-grain rice with one EC "long-grain" variety, Arborio. As can be seen, there is no relationship in the price movements of these two rices; sometimes they move in the same direction, but often they move in opposite direc-

144. A technical report, which describes the data set and all of the empirical tests, is available from the authors.

145. The import prices of the rices used in the empirical tests were converted to ECUs and grossed-up by the amount of the respective variable import levies to produce a point-of-first-inland-sale price for imported rice varieties. For EC rice, the market prices of the milled Italian rices were converted to ECUs to complete the data set. Thus, point-of-first-inland-sale prices, by month, were included in the data set for the five Italian rices and the nine Thai and U.S. rices previously discussed for the period between 1986 and 1988.

146. The 1986-1988 period is used because this is the base period employed for tariffication in the Uruguay Round of GATT negotiations.

147. A value of 1 denotes a perfect correlation while 0 indicates no correlation. The correlations among Thai A, B, and C, and SWR 5, 10, and 15%, are all on the order of .88.

148. This is confirmed by the authors' empirical research.

149. RANDOLPH BARKER ET AL., THE RICE ECONOMY OF ASIA 190 (1985) (discussing research conducted by Todd Petzel and Eric Monke).

150. Authors' empirical research.

tions. This is not a picture that would lead an analyst to suspect competition between these two products.[151]

At this point it is instructive to view the price movements of the five EC rice varieties themselves, as depicted in Appendix B.[152] An interesting picture emerges. The prices of the "long-grain" varieties are highly correlated, but the price of round-grain EC rice does not correlate with that of the "long-grain" varieties.[153] This is preliminary evidence that the round-grain variety called Balilla does not compete with the three "long-grain" varieties, but rather is contained in a separate market segment.

The observation of price movements provides some preliminary evidence concerning a proper segmentation of the EC rice market. U.S. long-grain rice correlates with Thai long-grain rice, but neither correlates with the EC "long-grain" rices. The three EC "long-grain" rices are highly correlated as among themselves but do not correlate with EC short-grain (Balilla). The preliminary indication is that there are at least three groups of separate competitors contained within the EC rice market: true long-grain rice (including U.S. and Thai rices), the so-called "long-grain" EC rices (more properly medium-grain), and short-grain EC rices. This indication must, however, be verified by more sophisticated empirical techniques.

B. *Regression Analysis*

Todd Petzel and Eric Monke, acknowledged experts on rice market integration, conducted a study that tested the integration of the world rice market.[154] They concluded that there was substantial cross-country integration in indica rice markets, but that round-grain rice production was not integrated with the rest of the rice market.[155] Their study noted the limitations of correlation analysis and suggested the use of regression analysis to test for mar-

151. Similarly, the price of Thai long-grain rice is uncorrelated with the price of EC Arborio.

152. Included are the prices of Arborio, Lido, Ribe, Roma, and Balilla by month for 1986 through 1988.

153. The correlation coefficient between Ribe and Roma is .77. The Arborio price is highly correlated with the Ribe and Roma prices (correlation coefficients of .84 and .81 respectively), but Arborio appears to sell at a substantial price premium above the other two rice varieties. The price of the short-grain EC rice, Balilla, does not correlate with the prices of Arborio, Ribe, or Roma. In many cases, the prices actually move in opposite directions.

154. Petzel and Monke, *supra* note 50.

155. *Id.* at 323.

ket integration.[156] The methodology proposed in that study is used here to test for competition among rice varieties traded in the EC.

The price of each rice type at a particular point in time is expressed as a function of the price of another type at the same time under the empirical test proposed by this Article. Each type is separately tested against each other type. Of interest is whether *any statistically significant* relationship emerges between the prices of the two rice types. A statistically significant *positive* relationship is necessary for an indication of competition on some level. The lack of a statistical relationship, or a relationship of the wrong sign, is not conclusive, but it nonetheless provides strong evidence that the two rices do not effectively compete against one another. Regression analysis is used to test the hypothesis.[157]

As expected, there is a strong correlation in the prices of EC "long-grain" rices. Appendix C shows the results of regression analysis projecting the price of "long-grain" EC Ribe rice as a function of "long-grain" Arborio rice, with the "regression line" provided.[158] The regression line illustrates the calculated functional relationship between the two price series. Because the line slopes upwards, it implies that as the price of Arborio increases, the price of Ribe will follow and vice versa—exactly what would be expected in a competitive market. This is what a statistically significant positive relationship looks like. Such evidence provides strong support for

156. *Id.* at 308-09. It should be noted that markets can be integrated without products being competitive. Competitive situations are a subset of integrated ones. "Integration is a spatial concept, and a spatially integrated market does not have to be competitive." *Id.* at 308. The Petzel/Monke test, therefore, is highly conservative, as it allows the greatest benefit-of-the-doubt when assessing the claim that items are competitors.

157. Regression analysis is a statistical method used to establish causal relationships in data. The "dependent" variable is expressed as a function of explanatory "independent" variables. Data for all the variables—generally time series, cross-sectional, or a combination of both—are subjected to mathematical manipulations which determine whether, within normal confidence intervals, the analyst can reject the hypothesis that the explanatory variables are unrelated to the dependent variable. For a historical and elementary discussion of regression analysis, see DAMODAR GUJARATI, BASIC ECONOMETRICS 11-19 (1978). For a more sophisticated view, see 2 HANDBOOK OF ECONOMETRICS (Zvi Griliches & Michael D. Intriligator eds., 1986).

In this exercise, the price of one rice variety becomes the dependent variable, while all others become explanatory variables in "pairwise regressions." Following the methodology proposed by Petzel and Monke, time trend, constant, and other necessary data manipulations are performed. *See* Petzel & Monke, *supra* note 50, at 310.

158. Appendix C is known as a scattergraph. The price of Arborio is on the horizontal axis and the price of Ribe is on the vertical axis. When there is a stable functional relationship, the individually marked data points, which represent the price pairs in one month, will cluster in a discernible pattern, such as a straight line. The superimposed line is the computer-predicted functional relationship between the prices. Note that the data points cluster around this line.

the proposition that these two EC rices compete in the same market, and that the price of one will affect the sales of the other.

This can be contrasted to regression analysis relating the price of EC Arborio rice to the true long-grain Thai A rice. Analysis shows that while Thai A rice is statistically related to U.S. long-grain rice, it is not statistically linked to any of the EC "long-grain" rices. Appendix D shows the price pairs over the sample period for EC Arborio and Thai A rice. The scattergraph shows a purely random distribution.[159] Changes in the price of Thai long-grain rice have no apparent effect on the price of Arborio. This could not occur if the two were in competition. Arbitrage possibilities would quickly force the prices of competing goods into line.[160]

The regression analysis tests the relationship between the price of each rice type with the prices of all other types in the data set. Appendix E shows the pairings in which statistically significant relationships were found. It is immediately apparent that there are no such relationships between the price of U.S. long-grain rice and any of the EC "long-grain" rices. Nor is there any relationship between the price of U.S. long-grain rice and any of the other (medium-grain or short-grain) EC rice varieties. Thus, there is no empirical evidence in these tests that U.S. long-grain rice competes against any of the EC rice types contained in this sample.

Similarly, there are no statistically significant relationships between the Thai long-grain rices and any of the EC rice varieties. The Thai long-grain rices are simply not contained in the same competitive market segment as the EC rices. There are also no statistical relationships between the Thai "medium-grain" rices and any of the EC rices. Most likely, these Thai rices should be contained in the long-grain indica category.

However, there are statistically significant, highly positive relationships among the EC "long-grain" varieties of Arborio, Ribe, and Roma, and the medium-grain Lido. These four rice types display no other statistically significant relationships with any other rice variety traded in the EC. Accordingly, they appear to be a market segment unto themselves. It is notable that short-grain EC Balilla is not statistically linked to the other EC rice varieties.

All of the Thai rice varieties are related in a positive, statistically significant way, regardless of grain type. This reflects the integra-

159. Note that, in contrast to Appendix C, the price-pair points in Appendix D do not display any pattern at all.

160. *See supra* notes 54-57 and accompanying text.

tion of Thai rice production previously discussed.[161] Similarly, U.S. long-grain rice is statistically linked to all Thai rices, reflecting competition among all indica varieties.

The regression analysis reported here was conducted under different functional forms, all producing the same conclusions. Thus, in economic parlance, the results are "robust." In addition, tests were performed to see if the prices of EC rices might be affected by events occurring in prior months.[162] There is no evidence that any indica Thai or U.S. rice prices, past or present, influence the prices of EC "long-grain" rices, or vice versa.

C. *Conclusion of the Regression Analysis*

This analysis, based on actual market performance, projects a picture of the way milled rice varieties compete in the EC market. There are essentially three separate classes of competitors with no significant overlap.

The first market segment is the indica long-grain category. It includes various grades and qualities of Thai and U.S. long-grain (and long/medium-grain mix) indica rice. The varieties contained in this long-grain category are distinguished by the cooking characteristics normally associated with long-grain rice.

The second category contains EC Ribe, Roma, Arborio, and Lido rice. These varieties cook sticky and chewy, and, despite the fact that their grains have the same length as (although much greater width than) long-grain rice, are properly categorized as medium-grain rice. There are no Thai or U.S. rice types that compete in this category.

The third category is short-grain rice, a rice whose cooking characteristics and size fit the classic definition of this kernel type. Balilla is the only rice variety included in the data set employed here in the short-grain category. True round-grain imports most likely would also be contained in this category.

VI. Conclusions

The Harmonized Tariff System was developed to facilitate international transactions, to expedite negotiations, and to make data

161. *See supra* note 149 and accompanying text.

162. So-called "Granger-causality" tests were used to see if there were lagged competitive responses. These tests show that Arborio consistently leads the way for price changes in other EC rice varieties. Similarly, Thai A is the price leader for related Thai rices of differing grades. There is some evidence, however, that the price of U.S. 2-4 causes changes in Thai A rather than the other way around.

collection more efficient. It has been largely effective in all of these areas. Yet at the level of aggregation necessary for international agreement, the HS cannot be expected to solve some of the more egregious uses of tariffs as means of protection. Almost by definition, these issues occur at levels of aggregation beyond the purview of the six-digit HS. Interpretations and dispute settlement procedures of the HS are powerless to address problems created by individual countries at a level beyond international agreement.

These issues are not trivial. This Article describes a situation in which Thai, U.S., and other rice imports[163] into the large and sophisticated EC market are subject to tariffs that double or triple their prices, despite the fact that such imports have virtually no domestic competitors.[164] There is no significant industry which needs protection.

The perpetuation of this misclassification greatly damages rice trade with the EC, primarily at the expense of developing countries. Thailand is one of the world's major rice exporters, selling over four million metric tons per year overseas.[165] Yet only about three percent arrives in the EC, primarily due to the obstacles of the steep variable levies.[166] This damage to Thai producers buys nothing for Italian producers of Arborio, Ribe, and Roma. In fact, the punitive import levies do nothing but produce some revenue for the EC—very expensive revenue in non-economic terms given the tension produced in international trade relationships.[167]

If proper economic tools were brought to bear, it would become readily apparent to the EC that the rice CAP wields an overly blunt weapon, hitting competitors and non-competitors, innocents and "guilty" parties alike. All countries would be well served by applying the concept of effective competition to tariff classifications. This would avoid mistakes like those inherent in the variable

163. India, Pakistan, Uruguay, Argentina, Australia, and other countries also export rice to the EC. *See generally* RICE COUNCIL UPDATE I, *supra* note 136 (describing each country's rice production, including export destinations).

164. It should be noted that Spain and Italy have very recently started producing true indica rice in minor commercial quantities. U.S. DEP'T OF AGRIC., AGR No. IT3008, at 28 (1993) (Italy); U.S. DEP'T OF AGRIC., AGR No. SP3026, at 37, 38 (1993) (Spain). However, the variable levies associated with the EC rice CAP are still based on Italian production that does not compete with true long-grain imports.

165. RICE COUNCIL UPDATE I, *supra* note 136, at 23.

166. Calculations based on statistics found between 1980 and 1988 in various issues of COMMITTEE ON COMMODITY PROBLEMS, FOOD AND AGRIC. ORG. OF THE U.N., REPORT OF THE INTERGOVERNMENTAL GROUP ON RICE, typically under the subheading, *World Rice Situation and Outlook*. *See also* EUROSTAT, *supra* note 126.

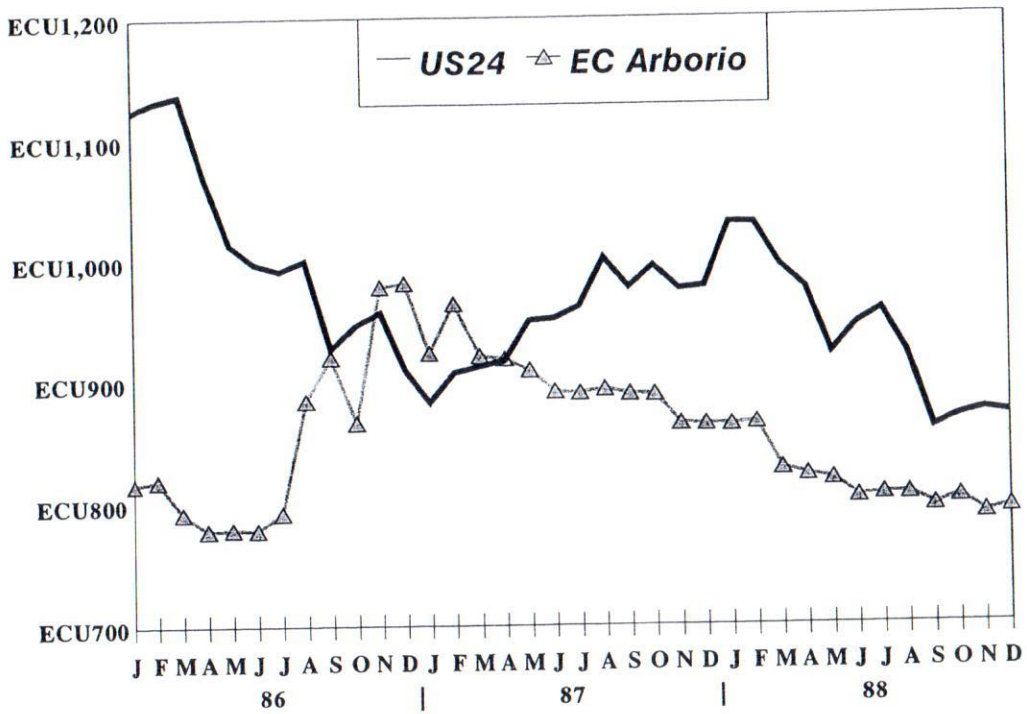
167. As of this writing the authors have witnessed trade tension between the EC and the United States, Uruguay, Thailand, India, and Pakistan.

import levies created by the EC rice CAP, and would make it possible for negotiators to work on the gradual elimination of artificial barriers to free and fair international trade.

APPENDIX A: Prices of EC Arborio and U.S. Long Grain Rice

Point of First Sale -- Price Per Tonne

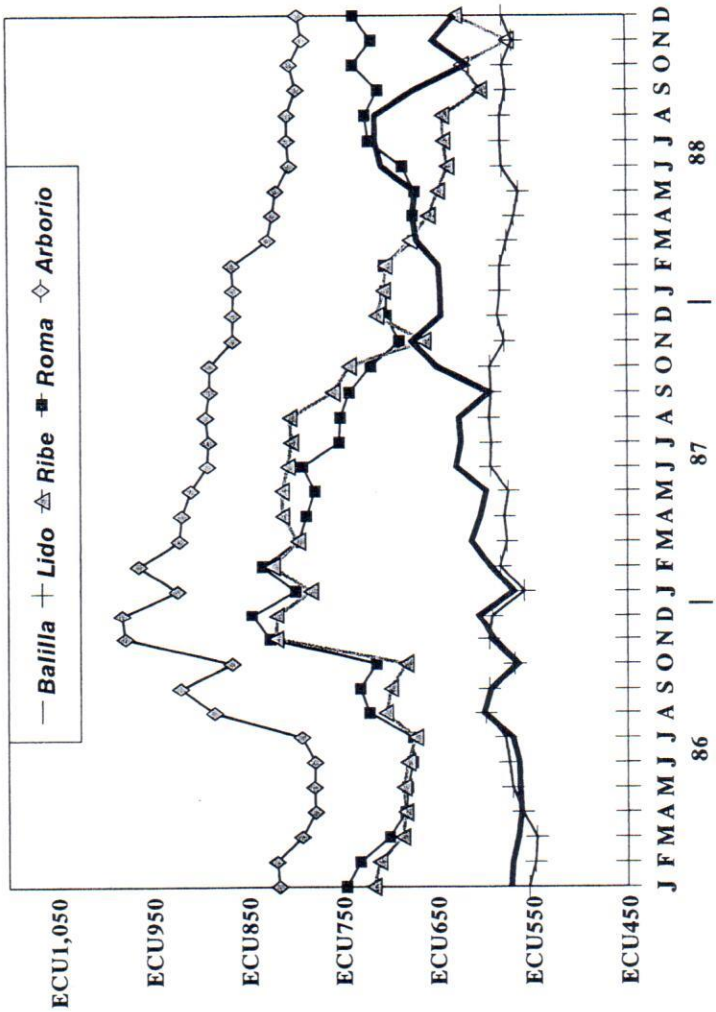
(Import Prices Include Variable Levy)



APPENDIX B: Market Prices of EC Rices

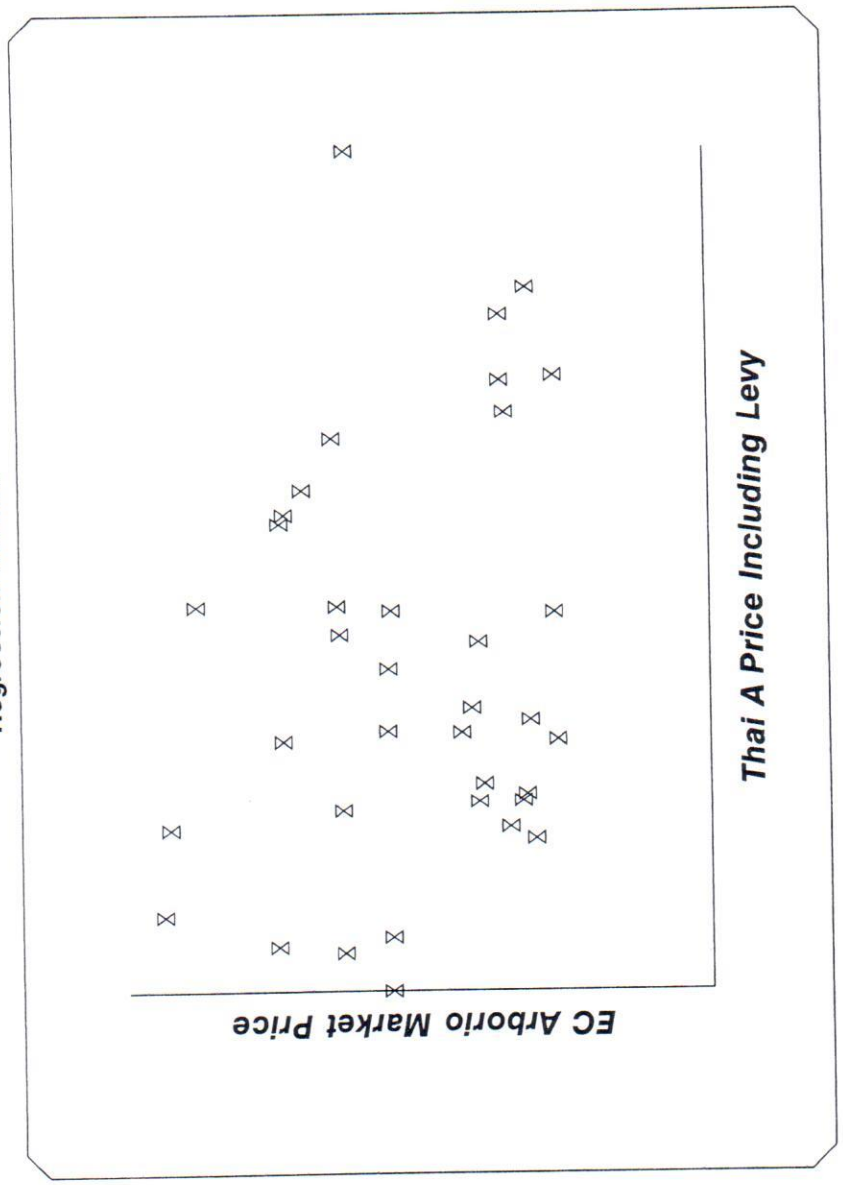
APPENDIX B: Market Prices of EC Rices

Point of First Sale -- Price Per Tonne



APPENDIX C: EC Ribe Rice Price as a Function of EC Arborio Rice Price
Regression Results

APPENDIX D: EC Arborio Rice Price as a Function of Thai Long Grain Rice Price
Regression Results



APPENDIX E

STATISTICAL RELATIONS AMONG DOMESTIC AND IMPORT PRICES IN THE EC

	US 2-4	Thai A	Thai B	Thai C	Thai SWR 5	Thai SWR 10	Thai SWR 15	Thai Super Extra	Thai Super	EC Balilla	EC Lido	EC Ribe	EC Roma	EC Arborio
US 2-4	→	•	•	•	•	•	•	•	•					
Thai A		→	•	•	•	•	•	•	•					
Thai B			→	•	•	•	•	•	•					
Thai C				→	•	•	•	•	•					
Thai SWR 5					→	•	•	•	•					
Thai SWR 10						→	•	•	•					
Thai SWR 15							→	•	•					
Thai Super Extra								→	•					
Thai Super									→					
EC Balilla										→				
EC Lido											→	•	•	•
EC Ribe												→	•	•
EC Roma													→	•

A • denotes a statistically significant relationship based on regression analysis.