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PRIVATE STRATEGIES, PUBLIC POLICIES & FOOD SYSTEM PERFORMANCE

SOME CAUSES AND CONSEQUENCES OF FOOD INDUSTRY CONDUCT: A SIMULTANEOUS ANALYSIS

by

James A. Zellner

WP-6 December 1987

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SOME CAUSES AND CONSEQUENCES OF FOOD INDUSTRY CONDUCT: A SIMULTANEOUS ANALYSIS

Conduct has long been considered an important factor influencing performance, both directly and through a feedback effect on market structure. While advertising has attracted the most attention, several studies have addressed another important form of conduct, new product introduction, or as it is sometimes called, product proliferation (Schmalensee 1978, Padberg and Westgren 1979, and Connor 1981). Advertising's effect on competition has been the subject of much controversy since the 1950's (Albion and Farris 1981). One school of thought sees advertising enhancing market power by increasing product differentiation, making demand for a given brand less elastic, and erecting high barriers to entry by new firms (Bain 1956, Comanor and Wilson 1967, 1974). The other argues that the lack of complete information leads to entry barriers and lowers price elasticity. Since it helps to eliminate the information gap, advertising increases competition (Stigler 1961, Nelson 1970, 1974, 1975). These different perspectives on the effects of advertising have lead to a number of empirical investigations of the relationships between the various structure, conduct and performance variables in traditional industrial organization models (Comanor and Wilson 1967, Nelson 1975, Strickland and Weiss 1976, Martin 1979, Pagoulatos and Sorenson 1981).

In this paper the effects of advertising, particularly whether it appears to further increase entry barriers, or facilitate entry are analyzed. The simultaneous effects of conduct on structure and performance, and their effects on conduct are also taken into account. Two forms of conduct, advertising and new product introduction (product proliferation), are studied. They are found to be substitute forms of conduct which have important implications for performance, measured by the price cost margin. In addition, both appear to lead to increased concentration. These results support the contention that the role of advertising is more to persuade, and raise entry barriers than to inform and facilitate entry.

A Broader Conceptual Framework

Shaffer (1980) proposed an expanded structure-conduct-performance (S-C-P) paradigm that included the usual structural variables internal to the industry, but also incorporated the system of rights and regulations, and perceived social and political pressures into what he termed "environment," a somewhat broader concept than structure. He also suggested broadening the concept of conduct, which he called "behavioral responses," to include the possibility of alternative managerial goals, and the potential for substituting some personal or societal goals for corporate objectives. This paper adopts Shaffer's more complete S-C-P model. The regulatory environment affecting food firm marketing and new product introduction decisions is specifically accounted for by incorporating food standards of identity and composition.

New Product Introduction and Advertising: Substitutes or Complements?

Consider two types of advertising, maintenance advertising, which is designed to retain markets and/or deter entry by new competitors, and introductory advertising, which accompanies new product introduction or new entry. I will argue that maintenance advertising is a substitute for, and hence inversely related to the level of new product introduction. Introductory advertising, on the other hand, should be positively associated with the level of new product introduction.

Connor (1981) defined product proliferation, his term for new product introduction, as filling the product space, or making it denser, by producing multiple brands, or flavors, of a product, or introducing slightly different new products to preclude entry into that particular market niche by firms outside, or other firms inside the industry. Limit pricing, excessive advertising, and product proliferation, are alternative means of deterring entry (Schmalensee 1978, Scherer 1979), each imposing higher entry costs than would exist in their absence. These alternate modes of conduct should be substitutes for one another, at least if they are used as alternate forms of entry-deterring behavior. But, the credibility of limit pricing and excessive advertising as permanent entry barriers may be subject to question, particularly if after entry by a new competitor it remains in the interests of all firms in the industry to jointly raise prices and reduce wasteful advertising. However, product proliferation poses a different kind of, and potentially more permanent, threat. If the product space is filled by a new product, the barrier is at least quasi permanent because once in place the new product must only generate sufficient revenue to cover variable cost to remain.

When viewed from the mainstream industrial organization perspective, new product introduction has the potential to be an anti-competitive form of conduct. Padberg and Westgren (1979), on the other hand, developed a framework for competitive rivalry between firms around a hypothesis of new product development which stresses incrementalism. They posit that consumers are risk averse, preferring marginal changes to major innovation, and that by offering products only slightly different from existing products, firms are responding to consumer preferences. From their perspective, we would expect to find that advertising is complementary to new product introduction because it serves to reassure consumers by promoting confidence and reducing the consumer's risk of making unsuitable choices (p. 621). If one differentiates between maintenance and introductory advertising, it is possible to rationalize both views.

Schmalensee (1972) introduced a Dorfman-Steiner type model of optimal advertising intensity (A/S), assuming profit maximizing behavior as:

$$A/S = (P-C/P)(a + na^{*}), \qquad 1)$$

where (P-C/P) is the profit margin as a percentage of sales, a is the demand elasticity with respect to own firm advertising, n is the conjectural elasticity of rivals response to own firm advertising, and a^* is the elasticity of own firm demand with respect to rivals' advertising. Consider the likely relationship of advertising intensity to a, n, and a^*. Since consumers know less about the characteristics of new than of existing products, there is more information to be conveyed through introductory advertising. It is reasonable to assume that the elasticity of new product demand w.r.t. advertising will be greater than for existing products, hence, for this reason new product advertising intensity would be expected to exceed that for existing products.

Schmalensee argues that n, the conjectural elasticity of rivals' advertising response to own firm advertising may be zero, since firms may find it difficult to perceive increases in advertising effort by rivals. However, if existing firms notice new entrants or new products accompanied by heavy advertising they are more likely to respond with stepped up advertising of their own, raising the cost of new entry by forcing new entrants to increase advertising intensity to levels at least as high as existing firms. Of course, existing firms may choose to fill the available product niches in anticipation of new entry, or heading off the adverse effects of failure to perceive increased advertising activity by rivals. The third term, a^*, elasticity of own firm demand w.r.t. rivals advertising would appear to be at least as high, and probably higher, for new entrants or new products, again necessitating higher advertising intensity to counteract.

Finally, the optimal advertising intensity is typically defined in terms of some target level of sales or market share. Since the new entrant is initially facing a smaller level of sales, advertising intensity will initially exceed the optimal maintenance level. In total, then, it would appear that the optimal advertising intensity for new entrants and new products would be higher than for existing firms and products. Thus, for new product advertising, one would expect a positive relationship between advertising intensity and the rate of new product introductions.

The data necessary to demonstrate that introductory advertising intensity is positively, and maintenance advertising intensity negatively, associated with new product introduction are not available. I used data on new product introductions from Advertising Age for 1975, where products were allocated to Census 5-digit product classes, and found that new food products accounted for about 3.5 percent of all advertised branded food products, by item count. Advertising expenditure data were obtained from Leading National Advertisers for 1975, and reported in Connor and Mather (1978). In those same cases newly introduced products accounted for about 4.3 percent of advertising expenditures. These data, based only on item count, suggest that the advertising intensities of new products exceed advertising intensity of existing products by more than 20 percent. Data on sales by product were unavailable, however, it is reasonable to assume that new product market shares based on sales were lower than item count share, hence the estimate of new product advertising intensity, and thus the 20 percent figure is probably quite low. But, also of note is the small share of branded products accounted for in this sample by new products. It would appear, that while advertising intensity of new products is higher than for existing products, total advertising on existing products (maintenance advertising) is likely to greatly exceed total advertising on new products (introductory advertising).

The Degree of Product Differentiability

The classification of product classes or industries by some measure of the degree of differentiability of products has been attempted numerous times.

Pagoulatos and Sorenson (1981) and Ornstein (1977) recognized the importance of product differentiability, noting that advertising may have more influence on market structure and performance for consumer goods, which are typically more differentiable, while other selling costs may have more influence on the structure of producer goods industries.1/ They used the share of industry output going to final demand as a proxy for differentiability. However, Connor, et. al., (1985) note that even within the consumer goods category some goods are more differentiable than others. The degree of differentiability of products, and its effect on the structural impacts of advertising and other conduct, are explicitly recognized in the present study. A newly developed set of data on ingredient standards is used to control for the degree of differentiability of product classes. Ingredient standards, established administratively under Federal law, have been previously overlooked as a structural factor that influences the types of conduct available to food industry firms.2/ By legally establishing the definition of a food, product standards have assured that these foods are more homogeneous than their non-standardized counterparts. Product classes with a high percentage of shipments subject to legal standards generally are more homogeneous, while those subject to few or no identity standards generally appear more differentiable. The categorization is not perfect but represents an external measure of food product differentiability which seems useful. Data on the extent of product class shipments subject to standards are contained in Appendix A. There are some cases where product classess are entirely subject to identity standards, yet where some products within those product classes have been successfully differentiated, e.g., bread, rolls, ice cream. There are other product classes where none of the products are subject to standards, yet where differentiation does not exist. I selected a level of 84 percent standardized to separate 43 highly standardized product classes from 33 less standardized product classes. Advertising intensity, a measure of the degree of differentiation (as distinct from differentiability), was nearly four times as high in the less standardized product classes. The simple correlation coefficient between advertising intensity and degree of product standardization is -.56, again suggesting that in those product classes where differentiability is difficult, differentiation activities are fewer.

A More Complete Structure-Conduct-Performance Model

The following four equation model is proposed to explain the association among advertising intensity, new product introduction, concentration and profits. Expected signs appear above the variables, which are defined in Table 1. Equations 1, 2, and 3 are similar to the models estimated by Strickland and Weiss (1976), Martin (1979), and Pagoulatos and Sorenson (1981). These studies hypothesized three equation models where advertising is a function of concentration, profitability, and variables influencing elasticity of demand,

$$1)\quad \text{A/S} = f(\overset{(+)}{\text{GROW}}, \overset{(+)}{\text{CR77}}, \overset{(+)}{\text{PCM5}}, \overset{(?)}{\text{NEWPROD}}, \overset{(+)}{\text{BRAND}}, \overset{(-)}{\text{STD}}),$$

$$2)\quad \text{CR77} = f(\overset{(+)}{\text{GROW}}, \overset{(+)}{\text{CAPCOST}}, \overset{(-)}{\text{CDRATIO}}, \overset{(-)}{\text{SIZE}}, \overset{(?)}{\text{STD}}, \overset{(?)}{\text{A/S}}, \overset{(?)}{\text{NEWPROD}}, \overset{(-)}{\text{BRAND}})$$

$$3)\quad \text{PCM5} = f(\overset{(+)}{\text{GROW}}, \overset{(+)}{\text{CR77}}, \overset{(+)}{\text{KYRATIO}}, \overset{(-)}{\text{GEOG}}, \overset{(?)}{\text{A/S}}, \overset{(?)}{\text{NEWPROD}}, \overset{(+)}{\text{BRAND}})$$

$$4)\quad \text{NEWPROD} = f(\overset{(+)}{\text{GROW}}, \overset{(+)}{\text{CR77}}, \overset{(+)}{\text{SIZE}}, \overset{(?)}{\text{A/S}}, \overset{(-)}{\text{PLABEL}}, \overset{(+)}{\text{BRAND}}, \overset{(-)}{\text{STD}})$$

concentration is a function of barriers to entry and conduct, and profitability is a function of the ease of collusion, barriers to entry, measures of conduct and factors influencing the elasticity of demand. Each found advertising to have effects consistent with the traditional industrial organization paradigm, i.e., advertising acts as a barrier to entry, encourages industry concentration, and contributes to elevated profits. Each of those studies, which used two-stage or three-stage least squares, were attempts to deal with the problem of the simultaneous determination of the variables of interest.

Equation 4 is similar to a model developed by Connor (1981). He hypothesized a single equation model whereby conduct was influenced by structure. In his model new product introduction (proliferation) was a function of concentration and other structural variables, advertising intensity, and another conduct variable, private label market share. Connor noted that while generally we think of structure as influencing conduct, and ultimately performance by influencing the types of conduct available to the firm, conduct may also feed back on industry structure. In addition to finding a positive association between structural variables, (concentration and packaging expenditures) and product proliferation, he found that advertising and proliferation were positively associated. In his model advertising intensity, a surrogate for the degree of product differentiation, was more a structural than conduct factor, and indeed his measure, which is the ratio of advertising expenditures by the four largest firms to estimated sales of those firms, may actually measure structure. Connor used a single-equation model in his study. A simultaneous model is more appropriate if firms substitute between excessive advertising and product proliferation in their efforts to deter entry, or if they increase advertising to inform consumers of newly introduced products. Ideally, such a model would be estimated using a separate measure of advertising intensity for newly introduced and existing products, since theory suggests that they would differ, and be related to new product introduction in opposite ways. Unfortunately such data are not available for the present study, the implications of which will be discussed below.

Results of other studies using single equation models of concentration, advertising, or profitability have generally been consistent with simultaneous model results. This study differs by including two forms of conduct, each of which can influence structure and performance, and which can in turn be influenced by structure and/or performance. Consequently the four equation model hypothesized above is estimated simultaneously using three stage least squares. While two-stage least squares would provide consistent estimates of the parameters, errors were correlated across equations, which can result in inefficient estimators, hence, necessitating the three-stage procedure.

All data used in the present study are for 1977, unless otherwise noted. Data definitions and sources are identified in Table 1. A sample of 76, five-digit food product classes was selected for this study. Some product classes were grouped in a manner similar to that used by Connor (1982), e.g., flour mixes and doughs were combined, as were cane and beet sugar. Producer goods product classes, e.g., ice cream mix, soybean mill products, animal feeds, etc. were excluded as were alcoholic beverages (see Appendix A).[3/]

In the following sections I discuss the four equations in the model and the variables included in each. In some cases, where others have discussed the rationale for inclusion of certain, largely control, variables in their models, and the reasons for expecting a particular sign, the reader is referred to those sources in the interest of space. However, several variables, which are subject to unique interpretation in the context of the present model, or which are new or have expected signs different from models developed by others, will be discussed in more detail. Also, an attempt is made to evaluate within the context of the model, the two perspectives on what advertising does (i.e., inform/facilitate entry or persuade/retard entry).

The Advertising Equation

Advertising intensity should be positively affected by CR77, PCM5 and GROW whether advertising is a tool of persuasion and an entry barrier, or if it is essentially information. Nelson (1975), argues that firms, even those producing experience goods (those whose characteristics can only be determined through consumption), advertise because they offer lower "cost" products which are a better value in a price-quality adjusted sense. Producers of such products are induced to advertise in order to convey that information, and are likely to be more profitable, and over time become larger, thus are more likely to be in concentrated industries. Hence, whether advertising increases entry barriers or provides information the expected effect of concentration on advertising would be positive. Strickland and Weiss, Pagoulatos and Sorenson, and Martin have discussed the expected relationship and rationale for inclusion of PCM5 and GROW.

If advertising is primarily information, and accompanies new product introduction to reassure risk averse consumers, a complementary relationship should exist between new product introductions and advertising intensity, even if measured at the product class level. But, if advertising is primarily used to restrict entry and NEWPROD measures conduct aimed at restricting entry into relatively empty product niches, the variables should be inversely related. As mentioned above, the best test of this would use separate measures of advertising intensity of new and existing products. Since such measures are unavailable, and since new product advertising was found to be such a small portion of total product class advertising, the inverse relationship is hypothesized. The assumption here is that if advertising and product proliferation are both used to restrict entry, the inverse statistical relationship between maintenance advertising and new product introduction would overwhelm the hypothesized positive association between introductory advertising and new product introductions.

The more branded products in the product class the higher should be advertising intensity, regardless of its role. The more standardized the industry's products, the lower the expected advertising intensity, whatever advertising's role, since there would be little information to convey about standardized products, and little ability to differentiate them.

The Concentration Equation

Following Pagoulatos and Sorenson, CAPCOST, CDRATIO, and SIZE are used to account for technological barriers to entry. Use of these measures avoids spurious correlation between CR77 and MES, and avoids explaining concentration essentially in terms of the number of plants (Pagoulatos and Sorenson 1981). The coefficients on CAPCOST and CDRATIO are expected to be positive and negative respectively. SIZE should be negatively related to concentration, and entry should be easier in growing industries, hence GROW should be negatively related to concentration.

STD is included as both a control and a structural variable in this equation. To the extent that STD measures the differentiability of products (i.e., a legally "standardized" product may be impossible to differentiate), it is a control for the conduct variables included in the equation. However, to the extent that STD measures an important structural factor it may directly affect concentration. In this latter instance the expected sign is not known a priori. On the one hand, if the government declares that most or all of the products in a class be standardized, the product space is "full" by definition, hence we would expect retarded entry and increased concentration. On the other hand, since standards of identity specify ingredients closely, there should be fewer technical barriers to entry, hence entry would be encouraged and concentration reduced.

The relationship of advertising intensity to concentration depends on what advertising does. If it is persuasive and results in building entry barriers the relationship should be positive. But, if advertising is information, and facilitates entry, a negative relationship would be expected. If NEWPROD measures conduct aimed at restricting entry into relatively empty product niches, a positive relationship between CR77 and NEWPROD would be expected. The number of competing branded products in the product class should be inversely related to concentration.

The Profitability Equation

Several variables in the profitability equation are expected to affect PCM5 the same regardless of one's perspective on advertising's effects. A positive relationship would be expected with CR77, KYRATIO, and GROW. KYRATIO is a measure of relative capital intensity and is required to normalize PCM across industries since the price-cost margin includes normal returns to capital. The concentration ratio is understated for some markets since it is constructed under the implicit assumption that all markets are national. GEOG, a proxy for whether the industry is in a national or regional market, takes on higher values the more production is centered in a single region. GEOG should be negatively related to PCM, since it corrects for CR77 which is understated for regional industries. The expected relationship between advertising and profitability in equation 3 is unknown a priori. A positive relationship would be expected if advertising is an entry barrier, and a negative, or zero relationship if advertising is information, since new entry resulting from the advertising would result in excessive profits being competed away.

The effect of the number of brands on profitability should be positive if they have been created via proliferation to fill the product space and deter entry. The measure used is the number of brands offered by only the largest 200 food firms, thus a positive association would be expected. The effect of NEWPROD on profitability is uncertain. It is quite expensive to launch a new food product (Buzzell and Nourse 1967, Scherer 1979), hence new product introduction may reduce short run profitability though be a profitable long run strategy, as evidenced by a positive coefficient on the number of brands.

The New Product Introduction Equation

It is expected that new product introduction will be greater the faster the rate of growth and the more concentrated the product class. Following Connor (1980) larger product classes, measured by SIZE, should have more "room" for additional products, hence a positive association is expected. NEWPROD and A/S should be inversely related if they are primarily alternate means of restricting entry, positively related if advertising is used primarily to inform consumers about newly introduced products. The larger the number of brands, the greater is the expected level of new product proliferation. The assumption here is that product classes with a large number of brands are those where product niches are in abundance. In one sense then, the number of BRANDS may measure the same thing that SIZE measures. New product introduction should be lower in product classes where a high percentage of shipments is subject to product standards. Also, private label (PLABEL) activity is typically greater in more homogeneous product classes, hence, new product introduction should be lower.

Results and Implications

The regression results in Table 2 support the view that advertising is a barrier to entry, rather than a form of information which facilitates entry. High advertising intensity appears to cause high profitability, rather than vice versa, casting doubt on the advertising as information view. An important form of conduct in the food industry, new product introduction (proliferation), is a substitute for intense advertising, and though costly to launch, appears to lead to higher profits after brands are established. Results for both conduct variables are consistent. New product introduction and advertising intensity each increase with growth, concentration and number of brands, and are inversely related to each other, and the degree of standardization. Private label share and product class size have insignificant effects on new product introduction. Profitability has the expected positive, though insignificant, impact on advertising intensity.

Concentration is positively affected by advertising intensity and new product introduction, and negatively affected by product class growth and branding, which is consistent with advertising as a barrier to entry. Neither physical entry barrier, capital cost or cost disadvantage of small size is significant, and capital cost has the wrong sign. Degree of standardization is positively associated with concentration supporting the contention that identity standards work to "fill" the product space, or perhaps to limit the potential size of product space that can be offered to consumers. This finding suggests that in addition to affecting industry conduct, standards of identity can significantly affect the market structure. Elimination of product standards would probably enable firms to offer a larger number of products, e.g., multiple flavors, brands with slightly different attributes, etc., which are now precluded by the standards, and would probably lead to a higher level of advertising intensity.

The performance measure used, the price cost margin, is positively affected by growth, concentration, advertising intensity, and the number of brands offered by leading firms, results consistent with advertising being an entry barrier. The negative coefficient on new product introduction, (significant at the .15 level), is consistent with a high cost of launching new products. The positive and significant coefficient on the number of brands offered by the largest firms suggests that once launched, a large number of brands is profitable. However, the number of brands is an imperfect measure of previous new product introduction activity. Further research using direct measures of both current and previous product introduction may be warranted. The capital intensity and geographic dispersion variables had the expected signs, and capital intensity was significant.

The results of this study, estimated so as to capture the simultaneous effects present in the four equations strongly suggest that at least two modes of conduct, advertising and new product introduction, are influenced by industry structure, and have an important influence on industry performance. These two forms of conduct also appear to have important feed back effects on structure. That these alternate modes of conduct appear to be used as substitutes for one another, supports the view that advertising is a barrier to entry rather than just information. This finding is strengthened by the fact that the product classes studied are limited to a narrowly defined set of consumer goods product classes within a single industry group. The presence of government imposed product standards appears to result in lower advertising intensity and new product introduction, normally considered pro-competitive conduct, however, the findings suggest that standards of identity may themselves be entry barriers by artificially "filling" the available product space.

FOOTNOTES

[1] Note that I use the term product differentiability, as distinct from the term product differentiation. I take the former to mean those characteristics of the product which make it different, or which make it possible to differentiate. The latter term is reserved for the method, e.g., advertising, packaging, etc., which is used to create or reinforce the product differeces in marketing the product.

[2] Since the passage of the 1938 Food, Drug, and Cosmetic Act, mandating regulations fixing for any food a reasonable definition, standard of quality, or standard of fill, nearly 300 standards, covering about 68 percent of the value of food produced, have been established. These standards, enforced by either the Food and Drug Administration, the National Marine Fisheries Service, or USDA's Food Safety and Inspection Service, specify mandatory and optional ingredients in foods which are to be known by a common name (USHHS 1981).

[3] Alcoholic beverages are subject to certain definitions enforced by the Department of Treasury's Bureau of Alcohol Tobacco and Firearms. Inclusion of these product classes in the anslysis as standardized industries does not change the results reported in this study, though the advertising intensity of these product classes is significantly higher than in other highly standardized product classes.

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TABLE 1. Data Definitions And Sources

A/S--The ratio of measured media advertising to estimated final consumer grocery store food sales. Advertising expenditures for network and spot TV, network radio, outdoor, magazine, and newspaper supplements are from Leading National Advertisers regrouped into SIC 5-digit product class categories by Richard T. Rogers. Data are generated from Tables 1 and 4 in Connor (1982). Sales data, from Connor (1982) are value of shipments adjusted for imports and exports, intraindustry sales, and an estimate of foodservice use, to obtain estimated grocery store sales at the five digit level. For three product classes, candy, chewing gum, and canned and bottled soft drinks, grocery store plus foodservice sales were used in constructing the advertising to sales ratio. Unlike most products, these do not lose their brand identity in foodservice use, and hence should be affected by advertising.

BRAND--Number of brands in each product class offered by one of the 200 largest food firms, from Connor and Mather (1978).

CAPCOST--Natural log of the estimated capital cost of the minimum efficient scale of plant, utilizing the mid-point plant methodology (the plant at the midpoint of the distribution of value added by all plants in the industry). Calculated from Census of Manufacturers data.

CDRATIO--An estimate of the cost disadvantage faced by a small plant versus larger plants following Caves, et. al. (1975), at the 4-digit level. Calculated from Census of Manufacturers data.

CR77--The four-firm concentration ratio for 5-digit product classes.

GEOG--A proxy, originally developed by Collins and Preston (1968) for whether the industry is in a national or regional market, calculated for 1972 at the 4-digit level, from Connor (1980).

GROW--Growth rate in real value of shipments from 1972-77, from the Census of Manufacturers.

KYRATIO--Capital output ratio for the 4-digit industry from Census of Manufacturers.

NEWPROD--New product introductions, (Connor 1980), from Advertising Age during 1977 and 1978.

PCM5--Price cost margins at the 5-digit level using the methodology developed by Rogers (1985), were calculated as value of shipments, less payroll and other direct costs, divided by value of shipments using Census data.

PLABEL--Percentage of product class value of shipments sold under no label or private label, from Connor (1982).

SIZE--Natural log of the estimated value of shipments to grocery stores.

STD--Percentage of product class value of shipments subject to an identity standard enforced by FDA, FSIS, or NMFS, calculated using Code of Federal Regulations and Census of Manufacturers data.

Table 2. Parameter Estimates of Determinants of Product Class Structure Conduct and Performance

Ind. Var.	A/S	CR77	PCM5	NEWPROD
	Coefficients (t-values in parentheses)			
Const.	-2.71 (1.45)	36.85 (1.17)	-4.60 (.42)	-8.48 (1.44)
GROW	4.29[a] (2.41)	-42.75[a] (-3.26)	14.11[c] (1.73)	13.49[a] (3.20)
CR77	.11[a] (3.10)		.33[c] (1.78)	.37[a] (3.91)
SIZE		.81 (.28)		-.43 (.58)
A/S		8.18[a] (2.51)	2.14[b] (1.91)	-3.11[a] (3.69)
PLABEL				.02 (.71)
BRAND	.053[a] (2.83)	-.61[a] (3.19)	.21[c] (1.82)	.18[a] (4.10)
STD	-.024[a] (2.93)	.20[c] (1.76)		-.07[a] (2.44)
PCM5	.0008 (.023)			
NEWPROD	-.34[a] (2.94)	4.08[a] (3.06)	-1.28 (1.45)	
CDRATIO		-10.95 (.67)		
CAPCOST		-2.89 (.92)		
KYRATIO			.26[b] (2.16)	
GEOG			-.06 (1.34)	

a,b,c= Sig. at .01, .05, .10 level respectively

APPENDIX A: Percent of Product Class Shipments Subject to Standards of Identity

SIC	Prod. Class Descript.	Pct.Ship.	SIC	Prod. Class Descript.	Pct.Ship
20111	Meat Packing, Beef 1/	100	20372	Frozen Vegetables	5
20112	Meat Packing, Veal 1/	100	20381	Frozen Baked Goods	30
20113	Meat Packing, Lamb 1/	100	20382	Frozen Entrees/Natl.	100
20114	Meat Packing, Pork 1/	100	20383	Frozen Specialties	0
20115	Lard	100	20411	Wheat Flour	100
20116,36	Processed Pork	100	20412	Other Wheat Mill Prod.	0
20117,37	Sausages	100	20413	Corn Mill Products	100
20118,38	Canned Meats	100	20430	Breakfast Cereals	0
20161,71	Dressed Chickens 1/	100	20440	Rice	0
20162,72	Dressed Hens 1/	100	2045,415	Flour Mixes and Dough	17
20163,73	Dressed Turkey 1/	100	20511	Bread	100
20164,74	Dressed Other Poultry 1/	100	20512	Rolls	100
20165,75	Processed Poultry 2/	0	20513-17	Sweets, cakes	0
20210	Creamery Butter 3/	100	20521	Crackers	0
20223	Natural Cheese	100	20522	Cookies	0
20224	Processed Cheese	100	2062,63	Refined Cane/Beet Sugar	0
20235	Dry Milk	100	20652,62	Chocolate Candy 4/	0
20236	Canned Mill	100	20653	Non-Chocolate Candy	0
2024	Ice Cream	100	20657,59	Nuts, Glace Fruits	48
20262	Fluid Milk	100	20668,998	Choc. and Cocoa Prod.	100
20263	Cottage Cheese	100	20670	Chewing Gum/Gum Base	0
20265,66	Flavored Milk, Yogurt	100	20791	Shortening	0
20321	Canned Baby Foods	100	20792	Margarine	100
20322,24	Canned Soups, Spec.	32	20860	Cnd. and Bot. Soft Drink	58
20323	Canned Beans	90	20910	Canned Seafood and Soup	60

APPENDIX A: (cont).

20331	Canned Fruits	89	20922	Fresh Packaged Fish	100
20332	Canned Vegetables	100	20923	Frozen Pkgd. Finfish	100
20333	Canned Hom. Mushrooms	92	20924	Frozen Pkgd. Shellfish	100
2033A,B	Canned Fruit Juices	100	20951	Roasted Coffee	0
20335	Canned Vegetable Juices	98	20952	Concentrated Coffee	0
20336	Catsup & Tomato Sauces	91	20980	Pasta Products	100
20338	Jams, Jellies, Pres.	100	20991	Ready to Mix Desserts	0
20341	Dried Fruit/Veg.	0	20992	Chips	0
20342	Dried Soup Mixes	0	20993	Sweetening Sirups	100
20352	Pickles, Relishes	0	20994	Baking Powder and Yeast	0
20353	Sauces for Meat	0	20995	Tea, consumer pkg.	0
20354	Mayonnaise, Dressings	73	20996	Vinegar, Cider	0
20371	Frozen Fruits & Juices	84	20999	Spice, Peanut But., Frost	31

Source: Calculated from Census of Manufactures, 1982; Manufacturers Industry Series; utilizing information from the Code of Federal Regulations on standards of identity.

[1] Raw meat and poultry are subject to legal definitions, which effect the use of the terms meat and poultry to identify processed products.

[2] While poultry is defined, the blend of ingredients, e.g., a poultry frank or other processed poultry product is generally not regulated. There are some exceptions, but they make up a small portion of the product class.

[3] Butter, which is subject to quality-based grades, may not be standardized under the 1938 Act.

[4] The cocoa product ingredients, but not the manner in which they are combined to make chocolate candy, candy bars, etc. are subject to a standard.

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