A STRUCTURE-PRICE-COST MARGIN MODEL ESTIMATED OVER TIME FOR FOOD AND TOBACCO PRODUCT CLASSES, 1954 TO 1977

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WP 75 June 1985

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Perhaps the most tested hypothesis in industrial organization is the structure-profits relationship. Weiss (p. 193) reviewed the theoretical underpinnings of the hypothesis and concluded: "In general, the main lines of oligopoly theory point rather consistently to higher prices in more concentrated industries." Although the theory is clearest for prices, most researchers have examined profit levels, assuming that if prices are elevated in concentrated industries then profits are likely to be higher as well. In addition to his theoretical review, Weiss reviewed over 50 empirical structure-profits studies and concluded (p. 231): "In general, the data have confirmed the relationship predicted by theory, even though the data are very imperfect and almost certainly biased toward a zero relationship."

Food manufacturing has been the focus of several structure-profits studies. Since Collins and Preston published their price-cost margin study for 32 food manufacturing industries in 1968, several other studies have been done. (e.g., Parker and Connor, Pagoulatos and Sorenson). In addition to these studies using

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[1] The author was an agricultural economist with the U.S. Department of Agriculture stationed with the Food Systems Research Group at Madison, Wisconsin while most of this research was conducted and is now an assistant professor of Agricultural and Resource Economics at the University of Massachusetts. The views expressed here do not necessarily reflect those of the U.S. Department of Agriculture. The author wishes to thank Julie A. Caswell and Bruce W. Marion for their helpful comments and John Coyle for his computer assistance in switching the analysis from The University of Wisconsin to the University of Massachusetts.

industry-level data, several structure-profits studies have been done using firm-level data (e.g., Federal Trade Commission, Imel and Helmberger, Rogers 1978).

Food manufacturing is well-suited for study because it has both a sufficiently large number of industries and the structural diversity in those industries to make cross-sectional analysis meaningful. There are 48 food manufacturing industries and four tobacco industries, which are included often with the food manufacturing industries. There is wide variation in the structural characteristics of these 52 industries. For example, in 1977 four-firm concentration ranged from 93 in the chewing gum industry to 19 in meat packing. Product differentiation varies from near zero in such producer-goods industries as raw cane sugar up to levels that are as high as those found anywhere in the economy (e.g., cereals and soft drinks). Similar variation exists in other structural dimensions.

The ability to limit a study to the food manufacturing industries eases the model building process. The industries in food manufacturing are more homogeneous than is the case across all manufacturing and thus the number of variables that must be controlled for in the model is reduced. Despite the narrowing of the research to the food manufacturing sector, the findings from these studies agree with Weiss's conclusions from his broader review of the literature. Specifically, profitability is higher in the more concentrated industries or for firms that operate in more concentrated industries.

Despite the numerous structure-profits studies already pub-

lished, disagreement remains (e.g., Ornstein). Few economists dispute the positive correlation between concentration and profitability but there is disagreement over its interpretation. Some argue that the positive relationship does not reflect oligopolistic coordination to raise prices, but rather it shows that larger firms are more efficient and have lower costs, and hence are more profitable. Other more technical debates concern model specification, whether the variables are properly measured, and whether a single-equation model is appropriate. Since Weiss explored the major points of contention in his review article, this paper will not address them.

The purpose of this paper is to estimate a structure-profits model in consecutive census years using a sample of food and tobacco product classes. It is often argued that the structure-profits relationship weakens in inflationary periods, and may in fact disappear in empirical studies of such periods. For this reason Weiss included the time period of the study as a major consideration in interpreting the empirical results of a structure-profits model.

Economists have found that during periods of general inflation prices in concentrated markets tend to rise more slowly than prices in competitive markets (Weiss, p. 200). Certainly when price controls are used to combat inflation, it is the largest firms that are most carefully watched for compliance. Even without price controls, prices increase in concentrated markets only when an explicit decision is made to raise them by a firm's managers. These managers usually avoid frequent price changes, weigh public opinion, and attempt to maintain any pricing

mechanism that may exist in the market (e.g., wait until the traditional price leader announces its pricing decision). In competitive markets no explicit pricing decision is required, as prices increase through market forces generated by increasing demand or increased costs. When inflationary pressures ease, firms in concentrated markets raise prices more rapidly than those in competitive markets as they attempt to make up for their pricing restraint during the inflationary period. Such reasoning led Weiss (p. 200) to conclude that the structure-profits relationship "...would be weakest at the end of periods of rapid inflation..." and "...should be strong a number of years after such an inflation and strongest during a long period of stability or depression."

In this paper, a structure-price-cost margin model is estimated for the same 50 food and tobacco product classes in each of six census years, covering the period 1954 to 1977. Based on Weiss' expectations the structure-profits relationship should be strongest in 1954, 1958, 1963, and 1967. It should be weakest in 1972, a year when price controls were used against inflation, and probably in 1977 as inflation continued despite an economic downturn. The empirical framework of this paper attempts to isolate the time-period influence on the structure-profits relationship, at least for food and tobacco product classes. Tests for significant differences in the relationship over time are presented.

The Data

One of the major strengths of this study is the care with which the data set was prepared. In developing the data set

considerable emphasis was placed on selecting Census industries and product classes that closely align with meaningful economic markets. The majority of the observations are at the 5-digit product class level of aggregation rather than the more commonly used 4-digit industry level. Most economists agree that 5-digit product classes better approximate relevant economic markets but choose the 4-digit industry level because of greater data availability.

Within food manufacturing, many 4-digit industries are defined so broadly that they clearly include noncompeting products (e.g., canned baby food and canned soup are in the same 4-digit industry but are in separate 5-digit product classes). Although this is often the case, there are instances where the 4-digit industry is the appropriate level of aggregation (e.g., beer is included as a 4-digit industry rather than using the product class data that separate canned from bottled beer). In one case, two 4-digit industries were combined because they produce products that are indistinguishable to the consumer (refined sugar made from sugar cane or from sugar beets). Other adjustments were made to the Census data to create a closer match between the Census data and economic markets.[2] (For a complete description of the data set see Rogers (1982).) A complete list of the data used in this study appears in the appendix.

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[2] For example, the soft drinks industry has a two-tier market structure, with the syrup manufacturers classified in SIC 20873, flavoring syrups for use by soft drink bottlers, and the soft drink bottlers classified in SIC 20860, bottle and canned soft drinks. SIC 20873 and 20860 were combined to form one observation. Concentration data were taken from SIC 20873 and value-of-shipments data were taken from SIC 20860.

The Model

Weiss expressed preference for a model (pp. 201,227) that uses the price-cost margin as the measure of profitability and controls for advertising, central office expenses, growth, and capital-output ratios. The price-cost margin is calculated from census establishment data and avoids the problems associated with diversification that hinder approaches that use firm profit data. The price-cost margin, however, does include such things as advertising, central office expenses and taxes. Although the model used in this study is based on Weiss' preferred model, neither central office expenses nor taxes were controlled for. In reworking a study by Collins and Preston, Weiss found central office expenses to be an insignificant variable. The omission of taxes from the model can be assumed to pose a minimal problem here since the study is limited to food manufacturing industries, which should have tax rates that are more homogeneous than is the case across all manufacturing. The estimated model has the following form with all of the estimated coefficients expected to be positive:

$$PCM = a + b_1 CR4 + b_2 A/S + b_3 G + b_4 KO + b_5 MES + e$$

where:

PCM = the product class price-cost margin [(VOS - CM - PR)/VOS], where VOS is value-of-shipments, CM is cost of materials, and PR is payroll.

CR4 = product class four-firm concentration ratio.

A/S = product class advertising-to-sales ratio based on 3 media (network television, network radio, and magazines) that were available in each year: 1954, 1967, 1972, 1977.

G = product class VOS growth rate from the preceding census year to the current census year.

KO = industry capital-output ratio; gross fixed assets/VOS.

MES = a plant economies of scale variable; the percent of the industry's VOS accounted for by the mid-point plant.

e = the error term.

The model was then estimated by ordinary-least-squares (OLS) for each census year i, where i= 1954, 1958, 1963, 1967, 1972, 1977.

The following substitutions were necessary:

when i = 1954 : G was from 1954 to 1958, KO and MES were from 1958

= 1958 : A/S was from 1954

= 1963 : A/S was from 1967, MES was from 1958

= 1967 : MES was from 1972

= 1977 : MES was from 1972

The substitutions were necessary because the data are not available or were not constructed for every census year. Only PCM, CR4, and G (in 1954 G must be measured over the period 1954 to 1958 because data prior to 1954 are unavailable) were constructed for each census year. In 1958 about half of the observations did not have KO data and 1963 data were substituted. MES values were calculated only for 1958 and 1972 because of time limitations. Both KO and MES were measured at the 4-digit industry level since the necessary data are unavailable at the 5-digit product class level. Advertising data were collected for only four of the six years.

These data substitutions are not serious problems. The use

of 4-digit data for KO and MES should be superior to omitting the variables from the model on the assumption that they would be equal across all food and tobacco product classes. Moreover, 13 of the 50 observations in the sample (26%) are 4-digit observations in any case. One year's KO data are a good measure of another year's because the variable was quite stable over time (e.g., the simple correlation between KO67 and KO72 was .95). This stability was true of the MES variable as well (MES58 and MES72 had a simple correlation of .86). The two years used for the MES variable capture any major changes over the entire 1954 to 1977 period. Advertising data were collected for only four of the six years, but again, these data are highly correlated over time (simple correlations usually exceeded .90) and the included years cover the entire time period. The advertising data were constructed by Rogers (1982) to match the census data. He assigned advertising expenditures for individual products to their appropriate product class creating a rare match between the census and advertising data (see Rogers (1982) for more detail and comparisons to other advertising data sources).

Many authors, including Weiss, used a geographic dispersion variable in their models to account for markets of varying size. Such a variable was not used here but local markets were excluded from the sample (e.g., fluid milk). This procedure eliminates the gross variability in market scope and permits the omission of such a variable.

The Results

The regression results (table 1) are best discussed by observing each independent variable's effect across the six years rather than discussing each equation in turn. First, the effect concentration (CR4) on price-cost margins was positive in all years but was not statistically significant at the 5% level in the first three census years. The estimated coefficient increased in magnitude and significance from 1954 to 1967, when it was significant at the 1% level, and then stabilized in the next two census years. This pattern is opposite to Weiss' expectations. He concluded that the best period for observing the relationship between concentration and profitability was in the years 1953 to 1967. For these food and tobacco product classes, the relationship was not apparent in 1954 and was marginally evident in 1958 and 1963, and was much stronger in 1967, 1972, and 1977. Although Weiss predicted strong results for 1967, he also predicted that the inflation and price-controls of 1972 would not allow the relationship to surface in that year. Here, 1972 presented the strongest results for concentration's effect and for the entire model as measured by the adjusted R^2. These findings are similar to Rogers' (1978) structure-profits study for a sample of food firms where yearly regressions were estimated over the period 1964 to 1970. He concluded that food firms were less sensitive to the business cycle than other manufacturing firms. This view is held by many business analysts that regard the food and tobacco industries as less influenced by macroeconomic conditions than many other manufacturing industries.

Table 1. Estimated Price-Cost Margin Models for 50 U.S. Food and Tobacco Product Classes, 1954 to 1977

Year	Constant	Concentration (CR4)	Advertising-to Sales (A/S)	Growth (G)	Capital-Output (KO)	Plant Economies (MES)	$\bar{R}^2$
1954	.062 (.033)	.0750 (.563)	1.957 (.878)	.1048** (.0601)	.3568** (.0881)	.1024** (.030)	.59
1958	.026 (.030)	.8163 (.5533)	2.404 (.840)	.1452** (.0558)	.3814** (.0813)	.0841** (.0278)	.70
1963	.026 (.040)	1.129 (.734)	2.138 (.808)	.1342* (.0582)	.3555** (.1177)	.0703* (.0379)	.58
1967	-.016 (.036)	1.780** (.638)	2.233* (.700)	.1926** (.0620)	.3729** (.1008)	.0552 (.0331)	.68
1972	.009 (.032)	1.742** (.578)	4.687** (.857)	-.0097 (.0371)	.3923** (.0969)	.0240 (.0306)	.75
1977	.015 (.041)	1.604** (.673)	3.430** (.876)	.0487 (.0341)	.2749* (.1343)	.0301 (.0360)	.61
All	.020 (.014)	1.148** (.2525)	2.854** (.324)	.0580** (.0149)	.3886** (.0406)	.0599** (.0133)	.65

Notes:

1. The standard error for each regression coefficient appears below it.
2. All significance tests were one-tail.
3. * The estimated coefficient was significantly different than zero (one in the case of A/S) at 5 percent.
   ** The estimated coefficient was significantly different than zero (one in the case of A/S) at 1 percent.
4. For agreement with the data published in the appendix the estimated coefficients and standard errors for CR4 must be divided by 1000, for A/S and G they must be divided by 100, and for MES they must be divided by 10.

The second variable, the advertising-to-sales ratio (A/S), had a positive effect in every year. This is not surprising for two reasons. First, the PCM, as calculated from census data, leaves advertising expenses in the margin, and thus advertising appears on each side of the equation. This is why Weiss maintains that advertising must be controlled for in using PCM models. Second, advertising is a proxy for product differentiation which is expected to be positively related to profit levels. To test the product differentiation hypothesis while accounting for the presence of advertising in the PCM requires testing that the estimated coefficient for A/S is greater than one, its base value given it is on both sides of the equation.[3] Since only the product differentiation hypothesis is of interest, the estimated coefficients of A/S were tested to determine if they were significantly greater than one, rather than zero as is the case with all the other variables. In the first three census years the estimated coefficients for A/S were not significantly greater than one at a 5% level of significance, but the statistical significance improved with time. By 1967 advertising's estimated coefficient was significant at the 5% level, and in 1972 and 1977 it was significantly greater than one at the 1% significance level. Thus, the hypothesis that product differentiation is positively related to profit levels received statistical support, especially in the more recent years.

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[3] To agree with the units of the raw data in the appendix, the test should be against .01, but the value one is used in the text to agree with the tables.

The third variable, growth (G), had the expected positive and significant effect in the first four census years but then became insignificant in 1972 and 1977. This deterioration in significance may be due to measuring growth in nominal terms, since 1967 to 1977 marked the inflationary period (food prices nearly doubled in this decade). The sharp increase in nominal growth from 1967 to 1977 may account for the abrupt drop in the size of the estimated coefficient on growth in 1972 and 1977. To test this idea the equations were re-estimated with G replaced by the percentage change in physical output (G-Q) since the last census year.[4] Although without knowledge of the price elasticity of demand one cannot predict the relationship between the two growth measures, the correlations between the two growth measures varied from .55 to .75, depending on the year. The results with G-Q paralleled those already reported for G, except the significance level of the estimated coefficient for G exceeded that for G-Q in every census year except 1977. The largest estimated coefficient for G-Q appeared in 1967 and in 1972 G-Q had a negative, yet insignificant, estimated coefficient. In 1977 the estimated coefficient of G-Q regained its positive sign, but unlike the result with G it had a magnitude similar to the pre-1972 levels and was significant at the 5% level. Thus, inflation appears to explain the drop in the size of nominal growth's estimated coefficient in 1977, but the result in 1972 is left unexplained.

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[4] Those industries that lacked physical output data were omitted from the re-estimation, leaving the following sample sizes: in 1977, n=47; in 1972, 1967 and 1963, n=48; and in 1958, n=43. The 1954 equation was not re-estimated.

The fourth variable, the capital-output ratio (KO), proved a powerful explanatory variable indicating that omitting it on the assumption that it would be nearly constant across food manufacturing's product classes would be wrong. As hypothesized, KO was positively related to price-cost margins. Its estimated coefficient and its standard error did not vary much from year to year.

The last variable, the plant technical economies of scale variable (MES), had a very strong effect in 1954, but then fell in significance over time. The standard error remained virtually constant over time so the decrease in significance is attributable to the declining size of the estimated coefficient. This pattern stands in stark contrast to the pattern found for concentration. Whereas MES was significant at a 5% level in the first three years and not in the last three years, the reverse was true of concentration. To gain confidence that the increase in concentration's effect was not a statistical artifact dependent upon the decrease in MES's estimated coefficient, the models were rerun with MES and KO omitted from the equations, since both MES and KO are positively correlated with concentration. The same pattern was found in these models; concentration became more significantly related to price-cost margins over time. This pattern is also clear when only years 1958 and 1972, the two years for which the MES variable were calculated, are considered. It appears that plant economies of scale were less of a factor in explaining price-cost margins in the later years and concentration became an important explanatory variable despite its earlier insignificance.

The results in table 1 clearly suggest that some of the estimated coefficients had a definite trend over the 23 year

period, especially CR4 and MES, and possibly A/S. However, Chow tests for structural change[5] between any two years, including the maximum time-spread possible, 1954 and 1977, failed to reject the null hypothesis of parameter constancy. Moreover, the generalized Chow test for all six equations favored pooling the data for the six census years.

Analysis of Pooled Data

The data for the six census years were pooled and estimated with a single equation (table 1, last equation). With all 300 observations in a single equation, all of the estimated coefficients in the model were significant at the 1% level. The full period was then split in half: 1954 to 1963 and 1967 to 1977. Pooling of the three census years within each of these two periods resulted in 150 observations for each period. This pooling allows for increased efficiency in estimation while retaining the possibility that the parameter estimates differed from the earlier period to the later period. The structural change test for these two equations rejected the null hypothesis of parameter constancy at the 5% significance level. This supports the observed trends in table 1, where the estimated coefficients for CR4 and A/S were not significant in the first three years (1954 to 1963) but were significant in the last three years (1967 to 1977). An opposite pattern occurred for MES and growth.

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[5] For a discussion of the Chow test see Johnston pp. 207-225.

Although the above test indicates a significant difference between the estimated equations for the two periods, it does not identify which of the coefficients were responsible for the significant difference. To determine this the two equations were stacked and estimated as a system of equations with two-stage least squares (2SLS). Each estimated coefficient from the first period's equation was tested against its counterpart in the second period's equation. These individual coefficient tests showed significant increases for CR4 and A/S, and a significant decrease for MES (all at the 5% level).

The full time period was then separated into three decades; the 1954 data were pooled with the 1958 data, the 1963 data with the 1967 data, and the 1972 data with the 1977 data. The model was estimated for each decade with each estimated equation having 100 observations. The results from estimation by OLS are shown in table 2. The patterns seen in table 1 are repeated here. The coefficient on CR4 increased over time whereas the coefficient on MES declined. A generalized Chow test for structural change rejected the null hypothesis of parameter constancy at the 5% level thereby discouraging further pooling of the years.

To test for individual differences in the estimated coefficients, the 1950's equation and the 1970's equation were stacked and the system was estimated by 2SLS. The results of testing each coefficient from the 1950's equation against its counterpart from the 1970's equation showed that the coefficient of CR4 had increased significantly at the 5% level, whereas the coefficient of MES had decreased significantly at the 1% level. In addition, the coefficient for A/S had increased significantly at the 1% level.

Table 2. Estimated Price-Cost Margin Models From Pooling Years 1954 with 1958, 1963 with 1967, and 1972 with 1977.

Year	Constant	Concentration (CR4)	Advertising-to Sales (A/S)	Growth (G)	Capital-Output (KO)	Plant Economies (MES)	$\bar{R}^2$
1954 and 1958	.0440	.4169 (.3868)	2.214* (.597)	.1240** (.0403)	.3705** (.0588)	.0936** (.0020)	.66
1963 and 1967	.0067	1.457** (.472)	2.215* (.501)	.1552** (.0408)	.3634** (.0744)	.0607** (.0024)	.64
1972 and 1977	.0161	1.649** (.4369)	3.832** (.604)	.0182 (.0213)	.3542** (.0770)	.0319 (.0023)	.68

Notes:

1. The standard error for each regression coefficient appears below it.
2. All significance tests were one-tail.
3. * The estimated coefficient was significantly different than zero (one in the case of A/S) at 5 percent.
   ** The estimated coefficient was significantly different than zero (one in the case of A/S) at 1 percent.
4. For agreement with the data published in the appendix the estimated coefficients and standard errors for CR4 must be divided by 1000, for A/S and G they must be divided by 100, and for MES they must be divided by 10.

Neither the coefficients of G nor KO showed any significant change. The results of these tests give statistical support to the observed trends first seen in table 1.

Summary

Overall, this structure-price-cost margin model supports the numerous other structure-profits studies. It is unique in that it examines the relationship in each census year over a 23 year period with the same 50 national food and tobacco product classes. The results indicate that the positive relationship of four-firm concentration and price-cost margins became stronger over time. The reverse was true for the relationship between plant economies of scale and price-cost margins. The positive effect of product differentiation, as measured by a media advertising-to-sales ratio, on price-cost margins grew stronger and more significant over time.

The findings support the view that the food and tobacco manufacturing sector is less affected by business cycles than other manufacturing sectors. The results indicate that in food and tobacco manufacturing the influence of market concentration on profits does not disappear during inflationary periods, as many industrial organization economists have hypothesized for industries in general. Indeed, in this analysis, the concentration-profit relationship was strongest during the 1967 to 1977 period--a period of relatively high inflation.

APPENDIX

This appendix includes the data sources, a list of the data, and a correlation matrix of the variables used. Since this data set is largely from Rogers (1982) the interested reader is urged to consult Chapter 4 and appendix B of that work.

I. Data Sources

A. Dependent variable

The price-cost margin (PCM) was calculated from Table 5a (establishments with this product class primary), Census of Manufacturers: Industry Report Series, Washington, D.C.; U.S. Department of Commerce, 1977 and earlier years. As an example, the calculation of the PCM77 for SIC 20112, Veal, was as follows:

VOS		CM		PR		VOS		PCM
:		:		:		:		:
(280.1	-	244.8	-	18.0)	/	280.1	=	.062 .

B. Independent variables

1. Concentration (CR4) and value-of-shipments (VOS), used to calculate growth (G), were from Rogers (1982). His basic source was Table 9 in 1977 (Table 6 in 1972), Census of Manufacturers: Concentration Ratios in Manufacturing (MC77-SR-9), Washington, D.C.: U.S. Department of Commerce.

2. The advertising-to-sales ratio (A/S) was from Rogers (1982). His basic source for the media advertising data was Leading National Advertisers, Inc., 1977 and earlier years. Value-of-shipments (VOS) was used as the denominator.

3. The capital-output ratio (KO) was calculated from Table 1a of the same source as for PCM. It was the ratio of gross value of fixed assets to VOS. In 1977 the assets data were unavailable so 1976 data were used for both assets and VOS. For 1963 and 1958 the source was the Annual Survey of Manufacturers: 1964 and 1965, Bureau of the Census, Washington, D.C.; U.S. Government Printing Office, 1968, Chapter 7, pp. 149-169. Neither 1963 nor 1958 had assets data hence 1962 and 1957 assets data were used but VOS were from 1963 and 1958 respectively. If no assets data were available for an industry in 1957, the KO from 1963 was used for the 1958 KO value.

4. The plant minimum efficient size variable (MES) was calculated by the percentage of total industry value-added contributed by the plant estimated to be at the midpoint of the distribution, using value-added per employee to interpolate within the proper employment size class (see Weiss's "Factors in Changing Concentration", The Review of Economics and Statistics, XLV, 1963, for more detail). The source of the MES variable was table 4 of the same source as for PCM.

II. List of Data

OBS. NUMBER	SIC577 1	NAME1 2	N2 3	N3 4	PCM77 116	PCM72 117	PCM67 118	PCM63 119	PCM58 120	PCM54 121	CR454 10	CR458 11	CR463 12	CR467 13	CR472 14	CR477 15
1	20111	BEEF,	NOT CA	NNED O	.05100	.05200	.05100	.05400	.04900	.03200	36	31	26	26	30	25
2	20112	VEAL,	NOT CA	NNED O	.06200	.07200	.06700	.07400	.08500	.07500	49	41	36	37	27	32
3	20113	LAMB A	ND MUT	TON, N	.05200	.05300	.06200	.06600	.03000	.06200	61	60	54	57	55	58
4	20114	PORK,	FRESH	AND FR	.05100	.05500	.05000	.06100	.05800	.03900	42	39	36	33	37	37
5	20115	LARD			.06000	.05900	.06000	.06100	.05500	.04600	45	41	33	33	37	39
6	20116	PORK,	PROCES	SED OR	.08700	.08100	.08600	.08700	.05800	.04800	40	30	25	22	22	18
7	20117	SAUSAG	E & SI	MILAR	.14400	.11400	.11200	.12900	.08600	.10200	24	22	20	19	17	22
8	20118	CANNED	MEATS	(EXCE	.09800	.09800	.09000	.11000	.14200	.14200	46	42	39	34	41	36
9	20119	HIDES,	SKINS	, AND	.12300	.12300	.21900	.18500	.15000	.15000	43	33	33	32	30	23
10	20151	HENS (	OR FOW	L) AND	.10700	.10300	.08100	.08200	.07300	.07800	18	12	14	17	18	23
11	20163	TURKEY	S (196	7 PROD	.10100	.11000	.07600	.08300	.05300	.10300	22	23	23	28	40	42
12	20172	LIQUID	, DRIE	D, AND	.08800	.14700	.16600	.09800	.12700	.11400	34	30	33	43	36	30
13	20232	CANNED	MILK	PRODUC	.35200	.27800	.25500	.20600	.20400	.19100	79	78	66	62	69	72
14	20233	CONCEN	TRATED	MILK,	.02800	.05600	.05400	.08300	.08000	.16900	45	38	41	31	29	33
15	20234	ICE CR	EAM MI	X AND	.14400	.11400	.13000	.12200	.09300	.17700	24	23	17	15	16	22
16	20321	CANNED	BABY	FOODS	.37800	.42000	.42500	.40700	.40700	.40700	95	94	95	93	95	98
17	20322	CANNED	SOUPS		.38000	.38000	.36600	.36600	.36600	.36600	89	90	92	93	95	95
18	20335	CANNED	VEGET	ABLE J	.19200	.26400	.21300	.23200	.24200	.23600	58	58	55	62	62	67
19	20338	JAMS,	JELLIE	S, AND	.27200	.19400	.23100	.18300	.17100	.12800	26	28	31	35	40	49
20	20352	PICKLE	S AND	OTHER	.28400	.26300	.22100	.24600	.19600	.15300	18	20	23	29	38	40
21	20371	FROZEN	FRUIT	S, JUI	.27900	.20300	.17800	.20100	.16700	.18800	40	34	28	30	41	36
22	20372	FROZEN	VEGET	ABLES	.26600	.26400	.24700	.21600	.24200	.25200	52	45	39	34	35	34
23	20412	WHEAT	MILL P	RODUCT	.16500	.14400	.14200	.10800	.12100	.10500	42	40	38	35	37	39
24	20430	CEREAL	BREAK	FAST F	.46000	.48500	.47500	.45600	.40600	.35000	78	80	82	82	84	81
25	20440	MILLED	RICE	AND BY	.20100	.16700	.19300	.12200	.11400	.10600	40	44	46	45	42	47
26	20471	DOG AN	D CAT	FOOD	.38200	.34800	.36100	.33300	.29300	.27400	32	38	42	46	54	58
27	20650	CONFEC	TIONER	Y PROD	.31900	.27800	.27400	.24800	.21500	.22200	18	17	15	24	32	36
28	20670	CHEWIN	G GUM	AND CH	.44100	.46700	.48400	.46500	.44700	.46500	84	83	86	81	84	93
29	20771	GREASE	AND I	NEDIBL	.22900	.24000	.19900	.25600	.20800	.23100	25	23	26	23	22	25
30	20772	MEAT M	EAL AN	D TANK	.21100	.24400	.18200	.21400	.17700	.19700	29	22	20	20	19	20
31	20791	SHORTE	NING A	ND COO	.12100	.15500	.14500	.10000	.10600	.14300	55	50	51	53	50	47
32	20792	MARGAR	INE (1	967 PR	.19900	.29700	.23800	.01900	.19000	.16600	39	46	50	47	54	60
33	20820	MALT B	EVERAG	ES 4 D	.26300	.32900	.35000	.35100	.33800	.36600	27	29	34	40	52	65
34	20830	MALT A	ND MAL	T BYPR	.18900	.16700	.14300	.20100	.21000	.16800	47	50	37	42	49	60
35	20840	WINES,	BRAND	Y, AND	.24600	.27400	.31000	.28400	.28300	.28300	38	35	44	48	53	49
36	20853	BOTTLE	D LIQU	ORS, E	.40800	.47300	.44800	.50600	.38400	.17800	67	61	58	53	51	54
37	20860	BOTTLE	D AND	CANNED	.32000	.34200	.36500	.39500	.37900	.27700	89	89	89	89	89	86
38	20871	FLAVOR	ING EX	TRACTS	.24300	.24800	.26600	.31600	.26000	.35700	35	28	27	18	23	21
39	20872	LIQUID	BEVER	AGE BA	.36900	.33800	.48900	.45800	.34400	.24700	83	63	73	74	65	78
40	20874	OTHER	FLAVOR	ING AG	.49700	.46900	.49400	.37100	.27600	.25800	38	44	51	59	68	76
41	20950	COFFEE	4 DIG	IT DAT	.14400	.29800	.28600	.26800	.18200	.13500	45	46	54	57	64	62
42	20980	MACARO	NI, SP	AGHETT	.34600	.27200	.27900	.27300	.21400	.18000	25	25	28	31	34	32
43	20991	DESSER	TS (RE	ADY-TO	.38500	.45100	.38800	.48600	.35500	.38500	80	81	86	81	80	81
44	20993	SWEETE	NING S	IRUPS	.30400	.28100	.26700	.16500	.21300	.18200	65	64	63	54	53	52
45	20996	VINEGA	R AND	CIDER	.23900	.19900	.25300	.23200	.22900	.24300	46	41	49	53	48	54
46	21110	CIGARE	TTES		.50700	.49300	.46600	.42500	.42400	.34900	82	80	80	80	84	88
47	21210	CIGARS			.28800	.45400	.34200	.34700	.28200	.22300	45	54	59	58	55	54
48	21310	CHEWIN	G AND	SMOKIN	.44000	.44300	.37200	.39700	.35600	.34600	56	53	53	50	60	65
49	21411	TOBACC	O, RED	RIED	.05200	.05300	.04900	.03200	.03700	.02000	82	72	77	65	60	67
50	21412	TOBACC	O, STE	MED	.05200	.05300	.04900	.03200	.03700	.02000	89	86	82	76	72	72

OBS. NUMBER	SIC577 1	NAME1 2	N2 3	N3 4	AS54 130	AS67 131	AS72 132	AS77 133	G5458 148	G5863 149	G6367 150	G6772 151	G7277 86
1	20111	BEEF,	NOT CA	NNED O	.003753	.0002163	.0003993	.0006243	27.2958	13.7148	29.6209	59.101	19.7492
2	20112	VEAL,	NOT CA	NNED O	.000000	.0000000	.0000000	.0000000	4.1499	-24.9457	-.9974	-21.514	32.2153
3	20113	LAMB A	ND MUT	TON, N	.000000	.0000000	.0000000	.0000000	2.2446	-1.6710	4.1986	5.692	-.3026
4	20114	PORK,	FRESH	AND FR	.000000	.0000000	.0000000	.0000000	10.1358	3.6812	26.7196	51.233	33.7985
5	20115	LARD			.020616	.0000000	.0000000	.0000000	-13.3612	-32.6506	-18.5152	-6.147	25.2047
6	20116	PORK,	PROCES	SED OR	.097656	.1450199	.1266211	.0512624	-1.3858	-10.2651	22.8360	20.194	56.5610
7	20117	SAUSAG	E & SI	MILAR	.086935	.1801802	.2294756	.2500855	28.5654	15.0701	30.2016	42.762	43.3648
8	20118	CANNED	MEATS	(EXCE	.426980	.4705745	.6265028	.6385418	2.6054	21.9679	17.2990	29.180	13.5587
9	20119	HIDES,	SKINS	, AND	.000000	.0000000	.0000000	.0000000	31.1308	-24.4505	23.6795	109.881	39.2826
10	20151	HENS (	OR FOW	L) AND	.069276	.0061098	.0000000	.0008591	31.0353	25.5940	24.9662	26.834	78.6427
11	20163	TURKEY	S (196	7 PROD	.022571	.1329503	.3252319	.2537474	26.5456	44.2032	35.7085	6.796	72.0408
12	20172	LIQUID	, DRIE	D, AND	.000000	.0000000	.0408424	.0000000	1.8243	-7.2993	14.2448	-1.817	99.5533
13	20232	CANNED	MILK	PRODUC	1.632474	2.2712933	.4863222	.5562165	3.1946	3.0957	30.9917	-10.053	57.2130
14	20233	CONCEN	TRATED	MILK,	.000000	.0000000	.0000000	.0000000	-7.5741	-10.5701	5.3121	66.330	100.3033
15	20234	ICE CR	EAM MI	X AND	.000000	.0000000	.0000000	.0000000	-.8368	33.1646	27.4398	13.227	28.7659
16	20321	CANNED	BABY	FOODS	1.813046	.7458384	.4424575	.7622726	24.5461	24.6220	6.7158	40.763	15.7485
17	20322	CANNED	SOUPS		3.158073	3.1376299	2.5839645	2.1983471	52.2770	8.9965	9.0703	12.536	40.8276
18	20335	CANNED	VEGET	ABLE J	1.567442	1.4136276	.7475915	.9023034	44.6512	-2.3580	14.3798	49.424	61.7213
19	20338	JAMS,	JELLIE	S, AND	.073750	.9628874	.4830539	.8286722	23.6875	14.8560	7.8751	14.315	41.5983
20	20352	PICKLE	S AND	OTHER	.243363	.2052955	.2137931	.6755242	25.4425	29.6296	18.1859	39.102	52.8069
21	20371	FROZEN	FRUIT	S, JUI	.418324	.8116806	.5302740	.4694408	39.5711	21.8715	-3.8506	74.017	58.0137
22	20372	FROZEN	VEGET	ABLES	.146341	.4657700	.4586614	.7391401	37.4777	71.3544	46.4394	57.682	96.6207
23	20412	WHEAT	MILL P	RODUCT	.000000	.0063632	.1042228	.2057532	-13.9416	18.8207	2.4060	8.957	104.5822
24	20430	CEREAL	BREAK	FAST F	7.015710	8.6836662	6.4870532	7.1223743	30.4532	30.0139	27.4849	30.585	96.1160
25	20440	MILLED	RICE	AND BY	1.250378	.5598540	.4514303	.4526282	6.2311	44.7209	34.6107	22.482	85.0864
26	20471	DOG AN	D CAT	FOOD	2.655072	3.9422775	3.6499165	4.3359832	26.4596	44.6955	58.3842	88.227	106.2472
27	20650	CONFEC	TIONER	Y PROD	.463886	.8783784	1.0208815	1.4481295	19.3286	18.8406	30.0574	28.902	78.4339
28	20670	CHEWIN	G GUM	AND CH	3.210423	3.6318499	3.1598233	5.0622208	14.0717	18.1039	31.4797	41.523	68.7370
29	20771	GREASE	AND I	NEDIBL	.000000	.0000000	.0000000	.0000000	35.1041	7.0936	14.5344	38.599	135.9084
30	20772	MEAT M	EAL AN	D TANK	.000000	.0000000	.0000000	.0000000	2.7107	41.5376	12.6064	40.101	93.7050
31	20791	SHORTE	NING A	ND COO	1.025554	.7712132	.7627160	.7115877	.7993	1.3402	35.9819	33.204	92.6442
32	20792	MARGAR	INE (1	967 PR	.856373	4.2744797	2.4934334	1.9224589	6.2478	9.2261	41.2438	28.434	82.5687
33	20820	MALT B	EVERAG	ES 4 D	.677755	1.0946109	.8004259	1.9279892	6.3241	15.7142	27.0947	39.248	63.7424
34	20830	MALT A	ND MAL	T BYPR	.000000	.0000000	.0000000	.0000000	-4.2465	.1082	8.0497	6.450	129.6383
35	20840	WINES,	BRAND	Y, AND	1.233068	2.3554364	1.7841618	2.5417981	5.1793	39.5076	11.3766	110.873	57.5145
36	20853	BOTTLE	D LIQU	ORS, E	4.226398	6.4360988	5.2944210	6.2819820	22.9359	19.9518	31.0319	33.771	21.9867
37	20860	BOTTLE	D AND	CANNED	.868132	.9323278	.7636913	.5252246	30.6701	47.1922	40.2865	60.188	77.1399
38	20871	FLAVOR	ING EX	TRACTS	.311350	.0336842	.0025210	.0000000	9.9693	38.4937	-4.3303	25.263	90.2521
39	20872	LIQUID	BEVER	AGE BA	.172324	.9053118	.9989785	1.0751173	54.5692	28.5473	70.6965	-24.634	117.5689
40	20874	OTHER	FLAVOR	ING AG	.230094	1.3813931	2.0215135	3.1094382	2.0690	83.7224	37.2785	29.055	100.5473
41	20950	COFFEE	4 DIG	IT DAT	.573806	.6601817	1.2396801	.7092261	-6.2808	-9.3598	11.9299	20.592	141.1963
42	20980	MACARO	NI, SP	AGHETT	.156188	1.4659686	3.1854155	1.5419715	9.3978	30.6110	15.0069	42.489	112.4647
43	20991	DESSER	TS (RE	ADY-TO	6.041430	6.0531622	3.0782186	5.7849358	12.7539	38.0403	13.8831	22.456	54.5284
44	20993	SWEETE	NING S	IRUPS	1.702046	3.5619596	.9665272	1.9137466	22.2506	42.7824	1.6850	20.533	77.4059
45	20996	VINEGA	R AND	CIDER	.390361	.5326279	.2171216	.0000000	6.5060	21.9457	5.1948	42.152	52.3573
46	21110	CIGARE	TTES		4.072911	7.1393902	3.0858918	3.1112131	31.5968	20.1778	14.5588	22.001	69.8947
47	21210	CIGARS			.426943	3.7047777	3.7114469	1.7876659	5.4305	.5122	2.5198	-1.326	-28.2956
48	21310	CHEWIN	G AND	SMOKIN	.702360	1.3317853	1.8656310	1.5587942	10.9960	13.0187	-11.0601	32.869	55.8835
49	21411	TOBACC	O, RED	RIED	.000000	.0000000	.0000000	.0000000	-36.3584	-25.8296	-29.9274	6.989	37.6613
50	21412	TOBACC	O, STE	MED	.000000	.0000000	.0000000	.0000000	12.7376	28.0271	1.0370	22.591	28.2401

OBS. NUMBER	SIC577 1	NAME1 2	N2 3	N3 4	N4 5	N5 6	KO76 122	KO72 123	KO67 124	KO63 125	KO58 126	KO58E 127	MES72 128	MES58 129
1	20111	BEEF,	NOT CA	NNED O	R MADE	INTO	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
2	20112	VEAL,	NOT CA	NNED O	R MADE	INTO	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
3	20113	LAMB A	ND MUT	TON, N	OT CAN	NED OR	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
4	20114	PORK,	FRESH	AND FR	OZEN		.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
5	20115	LARD					.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
6	20116	PORK,	PROCES	SED OR	CURRE	D SIC	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
7	20117	SAUSAG	E & SI	MILAR	PRODUC	TS (NO	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
8	20118	CANNED	MEATS	(EXCE	PT DOG	& CAT	.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
9	20119	HIDES,	SKINS	, AND	PELTS		.06800	.07800	.08800	.08600	.09800	.09800	.29000	.23000
10	20151	HENS (	OR FOW	L) AND	CHICK	EN (19	.11700	.14200	.14200	.08400		.08400	.32000	.24000
11	20163	TURKEY	S (196	7 PROD	UCT CL	ASS 20	.11700	.14200	.14200	.08400		.08400	.32000	.24000
12	20172	LIQUID	, DRIE	D, AND	FROZE	N EGGS	.12700	.16600	.16600	.08400		.08400	.32000	.24000
13	20232	CANNED	MILK	PRODUC	TS (CO	NSUMER	.14600	.19200	.19600	.18400		.18400	1.53000	.68000
14	20233	CONCEN	TRATED	MILK,	SHIPP	ED IN	.14600	.19200	.19600	.18400		.18400	1.53000	.68000
15	20234	ICE CR	EAM MI	X AND	ICE MI	LK MIX	.14600	.19200	.19600	.18400		.18400	1.53000	.68000
16	20321	CANNED	BABY	FOODS			.23200	.29700	.30300	.25200		.25200	2.59000	8.03000
17	20322	CANNED	SOUPS				.23200	.29700	.30300	.25200		.25200	2.59000	8.03000
18	20335	CANNED	VEGET	ABLE J	UICES		.26800	.32200	.30400	.26600		.26600	.17000	.20000
19	20338	JAMS,	JELLIE	S, AND	PRESE	RVES	.26800	.32200	.30400	.26600		.26600	.17000	.20000
20	20352	PICKLE	S AND	OTHER	PICKLE	D PROD	.20800	.24400	.24000	.28000		.28000	.84000	.74000
21	20371	FROZEN	FRUIT	S, JUI	CES, A	ND ADE	.28200	.31400	.22800	.22800		.22800	.92000	.57000
22	20372	FROZEN	VEGET	ABLES			.28200	.31400	.22800	.22800		.22800	.92000	.57000
23	20412	WHEAT	MILL P	RODUCT	S OTHE	R THAN	.14800	.19600	.19500	.18900	.15800	.15800	.68000	.63000
24	20430	CEREAL	BREAK	FAST F	OODS		.27000	.31300	.31100	.29300	.20700	.20700	9.47000	15.41000
25	20440	MILLED	RICE	AND BY	PRODUC	TS	.14200	.17200	.15700	.13300		.13300	9.93000	2.46000
26	20471	DOG AN	D CAT	FOOD			.26600	.28700	.16900	.16900	.14900	.14900	3.02000	.15000
27	20650	CONFEC	TIONER	Y PROD	UCTS		.23500	.27700	.28000	.22300	.22100	.22100	.64000	.57000
28	20670	CHEWIN	G GUM	AND CH	EWING	GUM BA	.31700	.38900	.33700	.27200	.21400	.21400	19.82000	23.45000
29	20771	GREASE	AND I	NEDIBL	E TALL	OW (19	.29500	.37900	.40800	.46900		.46900	.37000	.39000
30	20772	MEAT M	EAL AN	D TANK	AGE (1	967 PR	.29500	.37900	.40800	.46900		.46900	.37000	.39000
31	20791	SHORTE	NING A	ND COO	KING O	ILS (1	.16500	.24000	.25400	.26000		.26000	1.75000	1.57000
32	20792	MARGAR	INE (1	967 PR	ODUCT	CLASS	.16500	.24000	.25400	.26000		.26000	1.75000	1.57000
33	20820	MALT B	EVERAG	ES 4 D	IGIT D	ATA FR	.59000	.59200	.59200	.55700	.59700	.59700	1.37000	1.15000
34	20830	MALT A	ND MAL	T BYPR	ODUCTS		.29900	.48700	.46600	.42500		.42500	4.30000	3.19000
35	20840	WINES,	BRAND	Y, AND	BRAND	Y SPIR	.39600	.29600	.37700	.30100	.22600	.22600	2.06000	1.30000
36	20853	BOTTLE	D LIQU	ORS, E	XCEPT	BRANDY	.27200	.28700	.28500	.29300		.29300	2.64000	3.16000
37	20860	BOTTLE	D AND	CANNED	SOFT	DRINKS	.28300	.33900	.43800	.46300	.47500	.47500	.08000	.05000
38	20871	FLAVOR	ING EX	TRACTS	, EMUL	SIONS,	.14600	.17900	.18400	.15900		.15900	1.23000	1.49000
39	20872	LIQUID	BEVER	AGE BA	SES, N	OT FOR	.14600	.17900	.18400	.15900		.15900	1.23000	1.49000
40	20874	OTHER	FLAVOR	ING AG	ENTS (	EXCEPT	.14600	.17900	.18400	.15900		.15900	1.23000	1.49000
41	20950	COFFEE	4 DIG	IT DAT	A (5 D	IGIT D	.12100	.19300	.18400	.12000		.12000	5.82000	2.43000
42	20980	MACARO	NI, SP	AGHETT	I, AND	NOODL	.27300	.30400	.40000	.31900		.31900	1.82000	1.91000
43	20991	DESSER	TS (RE	ADY-TO	-MIX)		.22300	.28800	.28200	.21700		.21700	.29000	.27000
44	20993	SWEETE	NING S	IRUPS	AND MO	LASSES	.22300	.28800	.28200	.21700		.21700	.29000	.27000
45	20996	VINEGA	R AND	CIDER			.22300	.28800	.28200	.21700		.21700	.29000	.27000
46	21110	CIGARE	TTES				.18600	.19000	.17100	.14700	.10900	.10900	12.89000	9.63000
47	21210	CIGARS					.26400	.27800	.23100	.18300	.14400	.14400	7.62000	2.03000
48	21310	CHEWIN	G AND	SMOKIN	G TOBA	CCO AN	.24900	.31300	.34300	.22900	.17700	.17700	12.18000	9.83000
49	21411	TOBACC	O, RED	RIED			.16600	.13600	.14400	.11100	.06900	.06900	2.40000	1.48000
50	21412	TOBACC	O, STE	MED			.16600	.13600	.14400	.11100	.06900	.06900	2.40000	1.48000

PRICE-COST MODEL FOOD & TOBACCO COMPARE 1954 TO 1977

DESCRIPTIVE STATISTICS
UNBIASED ESTIMATES

VARIABLE NOS.	NAMES	SUM	MEAN	STANDARD DEVIATION	VARIANCE	RELATIVE ERROR BOUND	MINIMUM	MAXIMUM
10	CR454	.24670+004	.49340+002	.22215+002	.49349+003	.52334-15	.18000+002	.95000+002
11	CR458	.23560+004	.47120+002	.22052+002	.48631+003	.49082-15	.12000+002	.94000+002
12	CR463	.23590+004	.47180+002	.22642+002	.51264+003	.47104-15	.14000+002	.95000+002
13	CR467	.23490+004	.46980+002	.21652+002	.46880+003	.50343-15	.15000+002	.93000+002
14	CR472	.24480+004	.48960+002	.21335+002	.45518+003	.55283-15	.16000+002	.95000+002
15	CR477	.25530+004	.51060+002	.22398+002	.50165+003	.54671-15	.18000+002	.98000+002
86	G7277	.32708+004	.65417+002	.36324+002	.13194+004	.37380-15	-.28296+002	.14120+003
116	PCM77	.11619+002	.23238+000	.13529+000	.18303-001	.34786-15	.28000-001	.50700+000
117	PCM72	.11965+002	.23930+000	.13977+000	.19537-001	.34616-15	.52000-001	.49300+000
118	PCM67	.11749+002	.23498+000	.13811+000	.19073-001	.34295-15	.49000-001	.49400+000
119	PCM63	.11212+002	.22424+000	.14078+000	.19819-001	.31129-15	.19000-001	.50600+000
120	PCM58	.10214+002	.20428+000	.12008+000	.14418-001	.34290-15	.30000-001	.44700+000
121	PCM54	.97340+001	.19468+000	.11146+000	.12424-001	.35673-15	.20000-001	.46500+000
122	KO76	.98530+001	.19706+000	.10133+000	.10267-001	.42149-15	.68000-001	.59000+000
123	KO72	.11662+002	.23324+000	.11322+000	.12818-001	.46237-15	.78000-001	.59200+000
124	KO67	.11686+002	.23372+000	.11535+000	.13306-001	.45007-15	.88000-001	.59200+000
125	KO63	.10474+002	.20948+000	.11605+000	.13467-001	.37513-15	.84000-001	.55700+000
127	KO58E	.10149+002	.20298+000	.11813+000	.13955-001	.34804-15	.69000-001	.59700+000
128	MES72	.12430+003	.24860+001	.39644+001	.15717+002	.12154-15	.80000-001	.19820+002
129	MES58	.11268+003	.22536+001	.43218+001	.18678+002	.11080-15	.50000-001	.23450+002
130	AS54	.48043+002	.96086+000	.15699+001	.24646+001	.11989-15	.00000+000	.70157+001
131	AS67	.71286+002	.14257+001	.20829+001	.43385+001	.12820-15	.00000+000	.86837+001
132	AS72	.54440+002	.10888+001	.14957+001	.22371+001	.13364-15	.00000+000	.64871+001
133	AS77	.61457+002	.12291+001	.17566+001	.30857+001	.13007-15	.00000+000	.71224+001
148	G5458	.71719+003	.14344+002	.17847+002	.31853+003	.14390-15	-.36358+002	.54569+002
149	G5863	.88517+003	.17703+002	.23574+002	.55572+003	.13665-15	-.32651+002	.83722+002
150	G6367	.90762+003	.18152+002	.18565+002	.34466+003	.17135-15	-.29927+002	.70696+002
151	G6772	.15521+004	.31042+002	.28044+002	.78644+003	.19518-15	-.24634+002	.11087+003

NUMBER OF OBSERVATIONS 50.

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VARIABLE NO. NO. NAME	10 CR454	11 CR458	12 CR463	13 CR467	14 CR472	15 CR477	86 G7277	116 PCM77	117 PCM72	118 PCM67	119 PCM63	120 PCM58
10 CR454	1.000											
11 CR458	.974	1.000										
12 CR463	.945	.975	1.000									
13 CR467	.895	.941	.977	1.000								
14 CR472	.830	.902	.934	.970	1.000							
15 CR477	.794	.869	.906	.946	.977	1.000						
86 G7277	-.182	-.187	-.129	-.094	-.066	-.036	1.000					
116 PCM77	.340	.411	.464	.509	.586	.605	.189	1.000				
117 PCM72	.378	.465	.539	.583	.647	.651	.151	.935	1.000			
118 PCM67	.403	.459	.550	.603	.649	.662	.197	.933	.957	1.000		
119 PCM63	.400	.436	.507	.548	.589	.597	.142	.885	.915	.936	1.000	
120 PCM58	.462	.515	.579	.617	.668	.675	.147	.899	.938	.946	.947	1.000
121 PCM54	.353	.406	.471	.495	.562	.573	.175	.805	.832	.835	.852	.914
122 KO76	.044	.112	.168	.217	.292	.335	.200	.520	.551	.519	.554	.622
123 KO72	.052	.132	.167	.219	.294	.350	.337	.538	.566	.515	.553	.632
124 KO67	.056	.124	.167	.218	.281	.325	.332	.486	.516	.477	.522	.597
125 KO63	.014	.071	.094	.130	.184	.226	.330	.415	.439	.395	.454	.521
127 KO58E	-.053	-.003	.010	.050	.102	.150	.318	.336	.355	.320	.385	.443
128 MES72	.345	.403	.428	.416	.449	.469	.060	.476	.521	.484	.448	.496
129 MES58	.480	.516	.532	.525	.559	.565	.031	.539	.562	.552	.529	.602
130 AS54	.530	.591	.610	.610	.625	.586	.002	.632	.678	.633	.650	.669
131 AS67	.426	.507	.542	.543	.569	.541	-.016	.683	.746	.680	.623	.675
132 AS72	.305	.394	.454	.475	.510	.482	.027	.696	.770	.717	.677	.679
133 AS77	.343	.419	.476	.492	.534	.525	.047	.716	.767	.738	.716	.708
148 G5458	.129	.114	.127	.183	.195	.174	.053	.417	.350	.390	.416	.422
149 G5863	-.051	.006	.052	.073	.142	.144	.259	.514	.414	.430	.377	.367
150 G6367	-.079	-.067	-.030	.028	.045	.072	.316	.264	.235	.333	.231	.227
151 G6772	-.180	-.177	-.134	-.135	-.076	-.149	.059	.071	.058	.091	.115	.143

PRICE-COST MODEL FOOD & TOBACCO COMPARE 1954 TO 1977

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VARIABLE NO. NO. NAME	121 PCM54	122 KO76	123 KO72	124 KO67	125 KO63	127 KO58E	128 MES72	129 MES58	130 AS54	131 AS67	132 AS72	133 AS77
121 PCM54	1.000											
122 KO76	.622	1.000										
123 KO72	.643	.938	1.000									
124 KO67	.596	.902	.949	1.000								
125 KO63	.508	.850	.904	.952	1.000							
127 KO58E	.438	.788	.861	.912	.979	1.000						
128 MES72	.464	.222	.240	.163	.061	-.068	1.000					
129 MES58	.597	.257	.294	.247	.154	.028	.864	1.000				
130 AS54	.591	.282	.279	.220	.173	.083	.450	.576	1.000			
131 AS67	.533	.316	.285	.223	.177	.076	.474	.516	.906	1.000		
132 AS72	.519	.357	.315	.267	.203	.095	.511	.553	.800	.908	1.000	
133 AS77	.591	.404	.357	.287	.228	.129	.471	.565	.884	.903	.920	1.000
148 G5458	.362	.181	.185	.123	.145	.157	-.011	.141	.280	.254	.220	.220
149 G5863	.390	.310	.280	.251	.243	.216	.029	.038	.192	.201	.231	.316
150 G6367	.156	.042	.061	.016	.085	.120	-.004	.001	.149	.182	.232	.269
151 G6772	.209	.298	.187	.181	.217	.193	-.034	-.012	.056	.030	.081	.129

VARIABLE NO. NO. NAME	148 G5458	149 G5863	150 G6367	151 G6772
148 G5458	1.000			
149 G5863	.335	1.000		
150 G6367	.459	.459	1.000	
151 G6772	.251	.226	.167	1.000

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