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MARKETING DECISION SUPPORT SYSTEM FOR THE H. J. HEINZ COMPANY CASES

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Michael E. Wilens*

and

James R. Taylor*

The University of Michigan

*Michael E. Wilens is a Ph.D. student in the Department of Computer and Communication Sciences and James R. Taylor is the S.S. Kresge Professor of Marketing, both at The University of Michigan.

ABSTRACT

A database was constructed to support the product manager described in the Heinz Ketchup marketing cases. This writeup describes the use of this database in teaching the Heinz Ketchup cases. A detailed description of the database and some preliminary analyses are provided in a comprehensive appendix which can be distributed directly to students.

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INTRODUCTION

Case Summary

The series of three Heinz Ketchup cases[1] traces the problems facing Thomas Smith, the new Heinz Ketchup product manager, from early 1964 when Heinz Ketchup market share is declining, until fall 1965 when new marketing strategies have begun to work and national extensions to product lines are being considered. The students are placed into Mr. Smith's role and are asked to diagnose the problems facing Heinz in the ketchup market (case A), develop possible strategies for dealing with these problems (case B), and then extend potential solutions into a longer term framework (case C).

Supplement Purpose

A difficult problem which faces the students as they begin to analyze the Heinz cases is the amount of data which must be analyzed to ascertain relationships between important case issues. Product managers are gaining access to computer based decision support systems to help them organize and analyze marketing data. This paper describes efforts to provide students with a simple, but useful decision support system for the Heinz Ketchup product manager.

Most of the information provided by the exhibits in the

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[1]Case numbers 9-569-011/M-357, 9-569-012/M-358, and 9-569-013/M-359 distributed by the Intercollegiate Case Clearing House, Soldiers Field, Boston, MA 02163.

Heinz cases has been entered into a computer database which can be accessed and analyzed using the MIDAS statistical analysis system.[2] Many of the important analyses (some of which are merely graphical versions of case exhibits) already have been performed and are provided in appendix A. The hope is that by relieving students from the tedious and time consuming tasks of aggregating and entering the data into the computer, students will be able to focus their attention on critical case issues.

A second goal of organizing data for the students is to introduce them to the value of computer based decision support systems. Most M.B.A. students at the University of Michigan have been introduced to the MIDAS system and should be capable of accessing and analyzing information stored in a MIDAS database.

Guide to Using the Heinz Ketchup Database

The description of the database and the set of performed analyses have been written in the form of a report from the data processing department to the product manager. This report is included in this paper as an appendix A and can be copied and distributed to students when the Heinz ketchup cases are assigned.

The purpose of the data processing report is twofold.

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[2]MIDAS is an interactive statistical analysis system developed and maintained by the Statistical Research Laboratory of The University of Michigan. Appropriate reference materials are cited in the reference section of this document.

First, the report describes all the variables in the Heinz ketchup database including the source of the variables (e.g., exhibit number) and the database's name for the variables. Second, the report provides a comprehensive set of analyses which have already been performed for the students. These analyses are sufficient to answer critical questions addressed by the first Heinz case.

The variables represent data taken from Heinz cases (A) and (B) and are measured in bimonthly intervals starting from April 1963 through September 1964, a total of fifteen bimonthly periods.[3] Missing information is represented by the MIDAS missing data value of -0.0 and is automatically handled by MIDAS.

Teaching Objectives

There are two categories of teaching objectives for the Heinz cases. The first category contains those teaching objectives which are described in the teaching guides for the Heinz cases. These objectives are directed towards introducing students to the complex environment of a total marketing mix in an intensive marketing situation. Students must focus on the key *leverage points* at which improvements could be made, and must learn to deal with the trade-offs between different elements of the marketing mix which may be required when developing a new marketing program.

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[3]The file **N929:HZ.M15** contains the database for the first two cases (A) and (B). A second file, with the same variables but containing measurements for all three cases (twenty-one bimonthly time periods), is in file **N929:HZ.M21.**

The second category of teaching objectives addresses the problem of effectively handling large amount of information. Students should learn that a systematic approach to data collection and analysis can simplify tremendously their ability to analyze important case issues. Specifically, this paper was written with the following four objectives in mind:

1) To provide case information in a form that focuses student attention on important case issues.

2) To demonstrate the value of using computer aided analysis to reduce the quantity of information to manageable levels.

3) To encourage students to utilize formal techniques for analyzing marketing data.

4) To introduce students to the value (and costs) of information, particularly in light of computer based decision support systems.

While this second set of teaching objectives is not related directly to the problems of Heinz Ketchup per se, nonetheless, these issues will be very important to future product managers.

Teaching Strategy

The following student assignment is adapted from the teaching guides distributed with the Heinz cases:

1) Read Heinz (A), Heinz (B), and the data analysis report from corporate data processing.

2) Answer the following questions:

   a. Who has gained market share in this market? Why?

   b. What is Hunt's strategy?

   c. What is the consumer buying process for ketchup?

   d. How important is price in the consumer market

place?

e. What is the role of the trade in the consumer buying process?

Optional assignments would focus on the use of MIDAS to perform additional analyses on the ketchup market:

1) Perform further analyses to determine in more detail the relationships between input variables price, advertising, retail price, and dealer price and market share.

2) Utilize time-series techniques to examine sales trends in more detail.

3) Use MIDAS computational commands to refine data measurements to smaller market segments, e.g., separate the ketchup marketplace into regions.[4] MIDAS commands such as TRANSFORM, COMPUTE, and CODE are available for this purpose.[5]

With the explosive growth in the application of computers to business problems, many students are going to be faced with dealing with computer departments. Like other resources, information reporting activities are paid for directly out of the product managers budget; thus, information is not as free as it appears in academic settings. Assignments dealing with this issue include:

1) Suggest a set of standard reports which the data processing department should provide marketing on a periodic basis.

2) Suggest a set of reports which should be worked up for a new product offering. Is information from other Heinz product lines relevant? (It certainly is cheaper to copy existing reports.)

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[4]Exhibit 7 of case (A) lists market share by region and could be used as a basis for estimating other market measurements by region.

[5]The MIDAS command reference guides [2,3] describe in detail how these commands can be used to manipulate data in a MIDAS database.

2) Discuss the price which the product manager should be willing to pay for timely information.

The data processing report is directed towards diagnosing the Heinz market problems discussed in case (A). Since the data processing report merely provides a clearer display of exhibit information, the original teaching guide for case (A) continues to accurately reflect case issues. For convenience, the major points of that teaching guide have been incorporated into this report.

It is important to note that only simple, straightforward statistical techniques have been applied in the data processing report. While cross-correlations were used to examine the data, such techniques are not reported to avoid focusing too much attention on statistical methodology. The majority of analyses are composed of a graph of the data followed by a listing of the regression statistics as computed by MIDAS. Often, independent variables in a regression must be led a period or more before significant correlations between dependent and independent variables will appear, e.g., market share versus retail price. In MIDAS, a variable which has been led is followed by the number of periods led in parentheses.

CASE ANALYSIS

Each of the five questions listed in the teaching guide (and reproduced here) can be explored using analyses given

in appendix A.[4]

1. Who has gained market share in this market? Why?

Figure 1 (ketchup sales over time) shows that the total ketchup market has been growing at a steady annual rate. Figure 2 (market share over time) shows that during periods 1-15, Heinz market share declined at the same time Hunt's market share improved. Figure 3 shows that overall brand share has been increasing steadily so that private label competition is probably not a contributing factor to Heinz declining market share. Figures 4 and 5 examine the relationship between Heinz and Hunt's market share and indicate that during periods 1-15, the two shares are negatively correlated. (Note that figures 6 and 7 examine where Heinz picked up market share during periods 12-21 and so are not applicable in this situation.)

2. What is Hunt's strategy? Can they maintain it?

Figure 8 (retail advertising index over time) indicates that around the time of the decline (period 10), Hunt's advertising level was substantially higher than Heinz's advertising level. Compared to the other brands, Hunt's appears to be spending a large amount on advertising. Figure 9 (contribution per 14 oz. case over time) indicates that while Hunt's advertising spending is up, its contribution per case is decreasing steadily. Meanwhile,

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[4]Figures and tables are located in appendix A of this paper while exhibits are located in the Heinz cases.

Heinz seems to be maintaining a large contribution. As a note of interest, figures 10 and 11 indicate no obvious relationship exists between retail advertising and market share.

3. What is the consumer buying process?

No specific graphs or analyses apply directly to this issue. However, figures 24 and 26 (Heinz retail price versus market share) discussed below examine the role of price in the market place.

4. How important is price in the market place?

Figures 23 (retail price over time) shows that Heinz consistently maintains a price premium over the other brands for both 14 oz. and 20 oz. products. Figure 23 also shows that Hunt's is taking a rather aggressive pricing strategy, underpricing even the private labels. (Note that these prices are per 24 bottle case.) Figures 24 through 26 (Heinz retail price versus market share) demonstrate that price and market share are correlated for the 14 oz. package but not for the 20 oz. package. (Note that market share is lagged by two periods before a significant correlation appears.)

5. What is the role of the trade in the consumer buying market place?

Figures 12 through 22 apply to this issue. Figures 12 and 13 (market share versus average dealer price) indicate that Heinz dealer price is correlated to its market share

when dealer price is lagged one period. Similar results are found in figures 14 and 15 which analyze the 20 oz. size. Figure 17 (brand trade margins over time) show Heinz consistently offers the lowest trade margins while Hunt's offers among the highest trade margins. Figures 18 through 21 (Heinz market share versus trade margin) indicate that no linear relationship exists between market share and dealer price.

REFERENCES

[1] Burling, S. and R. Thomas. **Documentation for SOPH:GRAF**, Department of Aerospace Engineering, The University of Michigan, February 5, 1979. Available by $COPYing file SOPH:GRAF.DOC to a TN printer.

[2] **Elementary Statistics Using MIDAS**, Statistical Research Laboratory, The University of Michigan, 1976.

[3] Fox, D.J. and K.E. Guire. **Documentation for MIDAS**, Statistical Research Laboratory, The University of Michigan, Third Edition, September 1976.

[4] **Documentation for SCH3:COMPOSE**, Undated, Unauthored, Accessed via $COPY AERO:COMPOSE.DOC.

OVERVIEW

This document contains the information requested by the office of the Heinz Ketchup product manager. A database containing Heinz Ketchup market information has been constructed and a variety of preliminary analyses have been prepared. The analyses address key market issues; however, if further analyses are required, the database is available and can be accessed by the MIDAS statistical analysis system.

The database, referred to as the Heinz Ketchup Database (HDB), and the analyses are described in a series of tables attached to this report:

Table 1 describes each variables in the HDB.

Table 2 lists all graphs and analyses in terms of the variables described in Table 1.

Table 3 describes basic statistical measures for variables in the HDB.

In this report, the term *figure* refers to figures attached to this report. The term *table* refers to one of the tables described above. The term *exhibit* refers to exhibits in the Heinz Ketchup cases.

Information in the database was derived from two sources:

Heinz Cases	The data in the various exhibits of the case packets. In Table 1, data from exhibit 11 of case (A) would be cited as 11a.
computed	Variables computed using other database variables. The computation is described for all such variables.

Most of the variables in the database are from exhibits in

the case packets. Some of the derived variables are predictions based upon regression coefficients calculated by MIDAS.[7] These variables are useful for producing regression lines on the graphs.

Table 1 describes three attributes for each variable:

Name: The name given to the variable in the MIDAS database.[8]

Source: The source from which the variable is drawn. Variables are either labeled with appropriate exhibit numbers, referenced, or listed as derived in which case the computation is given in the description attribute.

Description: A description of the variable.

A naming convention for variable names was adopted to reduce the difficulty of using the database. The first two letters of a variable's name is a mnemonic for the variable's contents. The third, and, optionally, the forth letters of the variable's name indicate whether the variable applies to both 14 ounce and 20 ounce package sizes, to 14 ounce sizes, or to the 20 ounce size. Finally, the suffix (delineated by a period) indicates which company the variable describes: H. J. Heinz, *HZ*; Hunt Wesson, *HU*; Del Monte, *DM*; or Other, *OT*.

Many of the important relationships of variables in the database are explored in the series of graphs included in

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[7]The MIDAS SAVE command issued immediately following a MIDAS regression command will create a variable containing the values as predicted by the regression line.

[8]MIDAS variable names, which are restricted to eight characters in length, can be used interchangably with variable numbers.

this document and listed in Table 2. Graphs which have a regression line superimposed on the data are usually followed by a figure which details the regression computation.

The graphs were produced directly from the database using the SOPH:MIDASGRAF program described in [1].' The accompanying analyses are from the STAT:MIDAS program described in [2]. Both of these program are available to MTS users.

Table 2 describes four attributes for each graph or analysis:

Figure Number:	The figure number of the plot. Figures are attached to the back of this report.
Description:	A brief description of the graph or analysis.
Ordinate Variables:	The dependent variable plotted along the Y-axis of the plot. Multiple variables indicate multiple lines on a plot. Multiple sets of variable pairs indicates multiple graphs per page.
Abscissa Variables:	The independent variable plotted along the X-axis.

The table should be used by looking up a graph or analysis by the description field, then by looking up the ordinate and abscissa variables in Table 1.

Table 3 provides quantitative measures of each of the variables in the database as computed by the MIDAS **DESCRIBE**

'The MIDAS **SCATTER** and **PLOT** commands can also provide simple graphs of data and are easier to use than the programs used for this paper. Note that a third program, SCH3:COMPOSE, was used to combine multiple graphs produced by SOPH:GRAF onto one page [4].

command. Five attributes are given for each variable:

N The number of non-missing cases.

MINIMUM The minimum (non-missing) value assumed.

MAXIMUM The maximum (non-missing) value assumed.

MEAN The average value.

STD DEV The standard deviation.

To use MIDAS to analyze data in the Heinz database you must first acquire a computing center identification number, called a *CCID*, and a password. Once you are signed onto the computer, you then execute the MIDAS program:

$RUN STAT:MIDAS

MIDAS prints a greeting message and then waits for a command. Before you can perform any data analysis you must tell MIDAS to read the Heinz database:

READ INTERNAL FI=N929:HZ.M15 V=ALL

MIDAS will inform you that it has read the Heinz database variables. Any MIDAS command can now be issued.[10] (The names of the variables are given in table 3 of this report. Table 1 briefly describes each variable and its purpose.)

The user may use any of the variables in the database to perform additional analyses, although information can not be stored back into the database. Of course, users can save MIDAS results in their own files using the MIDAS write

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[10]The contents of the Heinz database can be displayed by MIDAS without reading it into MIDAS:

DISPLAY INTERNAL FI=N929:HZ.M15 V=ALL

Note that this merely lists the contents of the database but does not read it into MIDAS so that it is available for use.

command:

WRITE INTERNAL FI=*myfile* V=ALL C=ALL

where *myfile* is your own personal file which can be created by you:

$CREATE *myfile* TYPE=SEQUENTIAL

Of course, you can give your file any name which is twelve or less characters in length. Your file can be accessed at a later time by entering MIDAS and then using the same read command you used to read in the Heinz database:

READ INTERNAL FI=*myfile* V=ALL

The statistical techniques used for the analyses in this paper are simple linear regression and graphical display of data. Simple linear regression was used because it provides both correlation data and information about potential linear relationships. While a complete discussion of regression is beyond the scope of this paper, the highlights of regression output will be examined. Two characteristics of MIDAS are important to understand. First, the MIDAS regression command was designed for multiple linear regression and, as a result, some of the output for simple regression is redundant. Second, it is often desirable to *lead* or *lag* variables when computing correlations or regression coefficients, e.g., market share may be related to retail advertising in a prior period. In MIDAS, this can be accomplished by enclosing the desired lead in parentheses and appending it to the variable's name, e.g., figure 11 regresses market share against retail

advertising led one period:

REGRESS V=MST.HZ,RAT.HZ(1)

The highlights of output from the MIDAS regression command will be examined using figure 5 as an example. The figure examines the relationship between Heinz market share total (MST.HZ) and Hunt's market share total (MST.HU). The third line of the figure indicates that fifteen non-missing cases were used in the analysis. The hypothesis that there is no relationship between the variables can be rejected for any significance level above .0073 (computed by MIDAS using the F-STAT of 10.094). The simple correlation coefficient is given

MULT R= .66113

as well as the coefficient of determination

R-SQR= .43709.

The coefficient of determination (often called the *R-squared* value) roughly states that .43 of the variability of Heinz market share can be explained by the variability of Hunt's market share. The last section of the output provides the linear equation relating Heinz and Hunt market share as

MST.HZ(t) = .34001 - .41652 MST.HU(t)

where t denotes the time period. Note that the partial correlation (-.66113) and the significance of the coefficient (.0073) are redundent information.

The regression equation can be used to construct a *line*. The MIDAS **SAVE** command, shown following the regression output in Figure 5, computes that line and saves

it as a MIDAS variable. This is how the line in figure 4 was computed. Although lines are computed and saved throughout the analyses in this paper, they usually are not displayed on graphs because they impart a bias.

REFERENCES

[1] Burling, S. and R. Thomas. **Documentation for SOPH:GRAF**, Department of Aerospace Engineering, The University of Michigan, February 5, 1979. Available by $COPYing file SOPH:GRAF.DOC to a TN printer.

[2] **Elementary Statistics Using MIDAS**, Statistical Research Laboratory, The University of Michigan, 1976.

[3] Fox, D.J. and K.E. Guire. **Documentation for MIDAS**, Statistical Research Laboratory, The University of Michigan, Third Edition, September 1976.

[4] **Documentation for SCH3:COMPOSE**, Undated, Unauthored, Accessed via $COPY AERO:COMPOSE.DOC.

Table 1

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
PERIOD	defined	Time as measured in bimonthly periods from April/May 1962 through August/September 1965, a total of twenty-one periods. Although all variables start at period one, many variables span less than sixteen observation periods.
CS	derived	Total case sales = CS14 + CS20
CS14	9c	Total sales for all brands of 24, 14 oz. cases.
DP14.HZ	11a,1b,1c	Independent dealer price per case of 24, 14 oz. bottles of Heinz.
DP14.HU	"	Same as above except Hunts.
DP14.DM	"	Same as above except Del Monte.
DP14.OT	"	Same as above except all others.
RP14.HZ	12a,1b,1c	Retail price per case of 24, 14 oz. bottles for Heinz.
RP14.HU	"	Same as above except for Hunts.
RP14.DM	"	Same as above except for Del Monte.
RP14.OT	"	Same as above except for others.

Table 1 (continued)

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
CN14.HZ	derived	Contribution per case of 24, 14 oz. bottles for Heinz. = DP14.HZ - 2.75
CN14.HU	"	Same as above except for Hunts.
CN14.DM	"	Same as above except for Del Monte.
CN14.OT	"	Same as above except for others.
TM14.HZ	derived	Trade margin per case of 24, 14 oz. bottles of Heinz. = (RP14.HZ - DP14.HZ) / RP14.HZ
TM14.HU	"	Same as above except for Hunts.
TM14.DM	"	Same as above except for Del Monte.
TM14.OT	"	Same as above except for others.
MS14.HZ	13a	Market share of 14 oz. size for Heinz.
DP20.HZ	11a,1b,1c	Independent dealer price per case for 24 / 20 oz. bottles for Heinz.
DP20.HU	"	Same as above except for Hunts.
DP20.DM	"	Same as above except for Del Monte.
DP20.OT	"	Same as above except for others.

Table 1 (continued)

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
RP20.HZ	12a,1b	Retail price per case of 24, 20 oz. bottles for Heinz. (All sales are normalized to 24 unit cases.)
RP20.HU	"	Same as above except for Hunts.
RP20.DM	"	Same as above except for Del Monte.
RP20.OT	"	Same as above except for others.
CN20.HZ	derived	Contribution per case of 24, 20 oz. bottles for Heinz. Assumed variable cost per case of $4.58 computed as $4.58 = 20/14 * $2.75 = DP20.HZ - 4.58
CN20.HU	"	Same as above except for Hunts.
CN20.DM	"	Same as above except for Del Monte.
CN20.OT	"	Same as above except for others.
TM20.HZ	derived	Trade's margin per case of 24 / 20 oz. bottles of Heinz. = (RP20.HZ - DP20.HZ) / RP20.HZ
TM20.HU	"	Same as above except for Hunts.
TM20.DM	"	Same as above except for Del Monte.
TM20.OT	"	Same as above except for Other.

Table 1 (continued)

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
MS20.HZ	13a	Market share of 20 oz. size for Heinz.
CS20	9c	Total sales for all brands of 24, 20 oz. cases.
IVT.HZ	15a,2b,8c	Share of trade inventory for Heinz.
CST.HZ	5a	Total case sales (both 14 oz. and 20 oz.) for Heinz.
CST.HU	"	Same as above except for Hunts.
CST.DM	"	Same as above except for Del Monte.
CST.OT	"	Same as above except for others.
MST.HZ	5a,2b,7c	Total market share (i.e., both 14 oz. and 20 oz. sizes) for Heinz.
MST.HU	"	Same as above except for Hunts.
MST.DM	"	Same as above except for Del Monte.
MST.OT	"	Same as above except for others.
RAT.HZ	14a,2b,8c	All commodity importance of retail store advertising for Heinz.
RAT.HU	"	Same as above except for Hunts.
RAT.DM	"	Same as above except for Del Monte.

Table 1 (continued)

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
RAT.OT	"	Same as above except for others.
ADT.HZ	18a,4c	Advertising expenditures (^{1}000s) for Heinz.
ADT.HU	"	Same as above except for Hunts.
ADT.DM	"	Same as above except for Del Monte.
ADT.OT	"	Same as above except for Other.
MST.COMB	derived	Market share of brand names = MST.HZ + MST.HU + MST.DM
MST.HZHU	derived	Predicted linear relationship between Heinz market share (MST.HZ) and Hunt's market share (MST.HU).
MST.HZOT	derived	Predicted linear relationship between Heinz market share (MST.HZ) and other market share (MST.OT).
MSRAT.HZ	derived	Predicted linear relationship between Heinz market share (MST.HZ) and Heinz retail advertising (RAT.HZ).
MSRA1.HZ	derived	Same as above except only Heinz 14 oz. bottles.
MSRA2.HZ	derived	Same as above except only Heinz 20 oz. bottles.

Table 1 (continued)

Description of Variables in the H. J. Heinz Database.

Name	Source	Description
MSDP1.HZ	derived	Predicted linear relationship between Heinz market share (MS14.HZ) and Heinz dealer price for 14 oz. size (DP14.HZ).
MSDP2.HZ	derived	same as above except for 20 oz. size.
MSTM1.HZ	derived	Predicted linear relationship between Heinz market share (MS14.HZ) and Heinz trade margin for 14 oz. size (TM14.HZ).
MSTM2.HZ	derived	Same as above except for 20 oz. size.
MSRP1.HZ	derived	Predicted linear relationship between Heinz market share (MS14.HZ) and Heinz retail price for 14 oz. size (RP14.HZ).
MSRP2.HZ	derived	Same as above except for 20 oz. size.

Table 2

Graph and Analysis Descriptions

Fig.	Issue	Vert. Variables	Horiz. Variables
1	Total ketchup market	CST CS20 CS14	PERIOD
2	Market shares over time	MST.HZ MST.HU MST.DM MST.OT	PERIOD
3	Brand market share	MST.COMB MST.OT	PERIOD
4	Heinz versus Hunts market share	MST.HZ MST.HZHU	MST.HU
5	Heinz/Hunts share regression analysis (MST.HZHU)	MST.HZ	MST.HU
6	Heinz versus others market share	MST.HZ MST.HZOT	MST.OT
7	Heinz/other regression analysis (MST.HZOT)	MST.HZ	MST.OT
8	Retail advertising index over time	RAT.HZ RAT.HU RAT.DM	PERIOD
		RAT.HZ	PERIOD
		RAT.HU	PERIOD
		RAT.DM	PERIOD
9	Contribution over time	CN14.HZ CN14.HU CN14.DM CN14.OT	PERIOD
		CN20.HZ CN20.HU CN20.DM CN20.OT	PERIOD

Table 2 (continued)

Graph and Analysis Descriptions

Fig.	Issue	Vert. Variables	Horiz. Variables
10	Advertising versus market share	MST.HZ	RAT.HZ
		MST.HU	RAT.HU
		MST.DM	RAT.DM
11	Regression analysis of adv. versus market shares (MSRAT.HZ, MSRA1.HZ, MSRA2.HZ)	MST.HZ MS14.HZ MS20.HZ	RAT.HZ RAT.HZ RAT.HZ
12	Dealer price of 14 oz. versus market share	DP14.HZ	MS14.HZ
13	Regression analyses of dealer price 14 oz. versus market share. (MSDP1.HZ)	MS14.HZ	DP14.HZ
14	Dealer price 20 oz. versus market share.	DP20.HZ	MS20.HZ
15	Regression analyses of dealer price 20 oz. versus market share. (MSDP2.HZ)	MS20.HZ	DP20.HZ
16	Regression analysis of Heinz market share (14 oz.) versus trade margin, dealer price, etc. using SELECT. (MSAL1.HZ)	MS14.HZ	
17	Trade margins over time	TM14.HZ TM14.HU TM14.DM TM14.OT	PERIOD
		TM20.HZ TM20.HU TM20.DM TM20.OT	PERIOD
18	Trade margin 14 oz. versus market share	TM14.HZ	MS14.HZ

Table 2 (continued)

Graph and Analysis Descriptions

Fig.	Issue	Vert. Variables	Horiz. Variables
19	Regression analyses of trade margin 14 oz. versus market share (MSTM1.HZ)	MS14.HZ	TM14.HZ
20	Trade margin 20 oz. versus market share	TM20.HZ	MS20.HZ
21	Regression analyses of trade margin 20 oz. versus market share (MSTM2.HZ)	MS20.HZ	TM20.HZ
22	Regression analysis of Heinz market share (20 oz.) versus all input variables (MSAL2.HZ)	MS20.HZ	
23	Retail price over time	RP14.HZ RP14.HU RP14.DM RP14.OT	PERIOD
		RP20.HZ RP20.HU RP20.DM TP20.OT	PERIOD
24	Retail price 14 oz. versus market share	MS14.HZ	RP14.HZ
25	Regression analyses of retail price 14 oz. versus market share (MSRP1.HZ)	MS14.HZ	RP14.HZ
26	Retail price 20 oz. versus market share	MS20.HZ	RP20.HZ
27	Regression analyses of retail price 20 oz. versus market share (MSRP2.HZ)	MS20.HZ	RP20.HZ

Table 3
Description of MIDAS database

Variable	N	Minimum	Maximum	Mean	Std Dev
1.PERIOD	15	1.	15.	8.	4.4721
2.DP14.HZ	15	4.8	5.28	5.0973	.139
3.DP14.HU	15	3.36	4.42	3.7113	.381
4.DP14.DM	15	3.29	4.3	3.7487	.314
5.DP14.OT	15	3.62	4.18	3.8307	.178
6.MST.HZ	15	.236	.298	.263	.017
7.MST.HU	15	.14	.234	.185	.027
8.MST.DM	15	.181	.224	.197	.014
9.MST.OT	15	.329	.409	.355	.023
10.MS14.HZ	13	.127	.192	.157	.018
11.MS20.HZ	13	.086	.099	.092	.004
12.RAT.HZ	15	.18	.4	.317	.061
13.RAT.HU	15	.11	.36	.224	.075
14.RAT.DM	15	.2	.38	.292	.053
15.RAT.OT	15	.01	.42	.167	.117
16.RP14.HZ	14	5.904	6.192	6.0549	.075
17.RP14.HU	12	4.464	5.376	4.846	.264
18.RP14.DM	14	4.752	5.328	4.9903	.196
19.RP14.OT	12	5.04	5.472	5.202	.166
20.CS14	15	2.54	3.	2.738	.109
21.CS20	15	.9	1.36	1.1267	.153
22.IVT.HZ	10	.266	.334	.294	.021
23.CS	15	3.5	4.29	3.8647	.221

Table 3 (continued)
Description of MIDAS database

Variable	N	Minimum	Maximum	Mean	Std Dev
24.CST.HZ	15	.921	1.1138	1.0143	.049
25.CST.HU	15	.5138	1.0039	.718	.140
26.CST.DM	15	.658	.9184	.763	.082
27.CST.OT	15	1.253	1.501	1.3685	.064
28.MST.COMB	15	.591	.671	.645	.023
29.CN14.HZ	15	2.05	2.53	2.3473	.139
30.CN14.HU	15	.61	1.67	.961	.381
31.CN14.DM	15	.54	1.55	.999	.314
32.CN14.OT	15	.87	1.43	1.0807	.178
33.TM14.HZ	14	.132	.194	.160	.020
34.TM14.HU	12	.245	.299	.267	.019
35.TM14.DM	14	.197	.308	.2574	.035
36.TM14.OT	12	.238	.295	.264	.018
37.RP20.HZ	14	8.112	8.856	8.5663	.233
38.RP20.HU	12	6.624	7.536	6.896	.297
39.RP20.DM	14	6.72	7.752	7.1023	.362
40.RP20.OT	12	7.224	7.92	7.532	.257
41.DP20.HZ	15	6.46	7.42	6.9647	.307
42.DP20.HU	15	4.58	6.19	5.1807	.517
43.DP20.DM	15	4.8	6.07	5.2707	.393
44.DP20.OT	15	5.14	5.78	5.326	.228
45.TM20.HZ	14	.162	.2189	.191	.018
46.TM20.HU	12	.229	.335	.281	.033

Table 3 (continued)
Description of MIDAS database

Variable	N	Minimum	Maximum	Mean	Std Dev
47.TM20.DM	14	.227	.314	.266	.027
48.TM20.OT	12	.2702	.323	.296	.020
49.CN20.HZ	15	1.88	2.84	2.3847	.307
50.CN20.HU	15	0.	1.61	.601	.517
51.CN20.DM	15	.22	1.49	.691	.393
52.CN20.OT	15	.56	1.2	.746	.228
53.AD.HZ	9	23.	814.	373.56	327.23
54.AD.HU	9	89.	1409.	915.89	371.24
55.AD.DM	9	39.	339.	183.44	89.462
56.MST.HZHU	15	.243	.2817	.263	.011
57.MST.HZOT	15	.257	.276	.263	.006
58.MSRAT.HZ	15	.253	.279	.263	.007
59.MSRA1.HZ	15	.146	.174	.157	.008
60.MSRA2.HZ	14	.0901	.096	.092	.001
61.MSDP1.HZ	13	.137	.168	.157	.010
62.MSDP2.HZ	14	.089	.096	.092	.002
63.MSTM1.HZ	14	.1478	.1692	.158	.007
64.MSTM2.HZ	14	.090	.094	.092	.001
65.MSRP1.HZ	13	.130	.183	.157	.014
66.MSRP2.HZ	14	.089	.098	.092	.003

Graphs and MIDAS Analysis Output

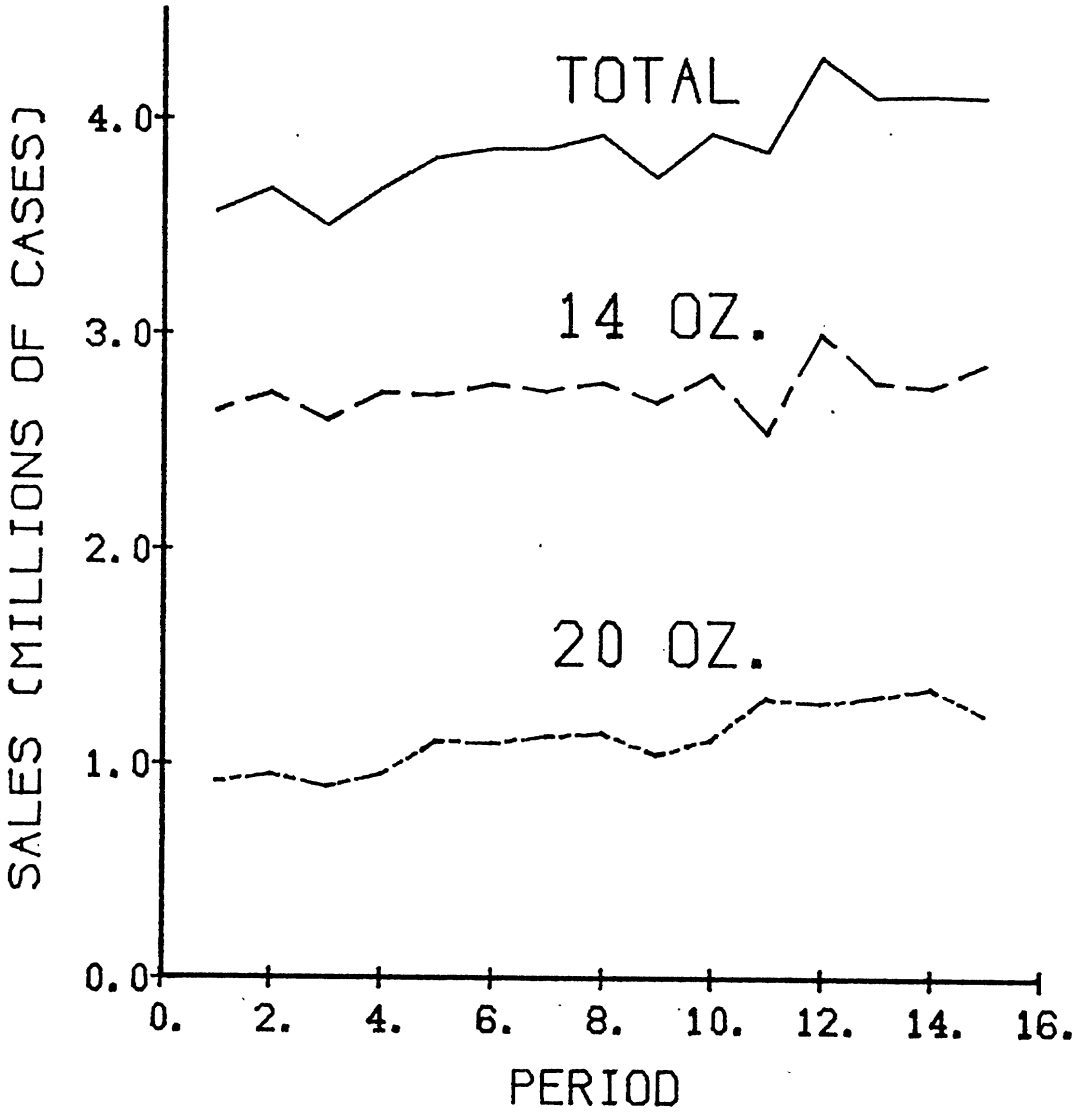


Figure 1

Total ketchup market over time

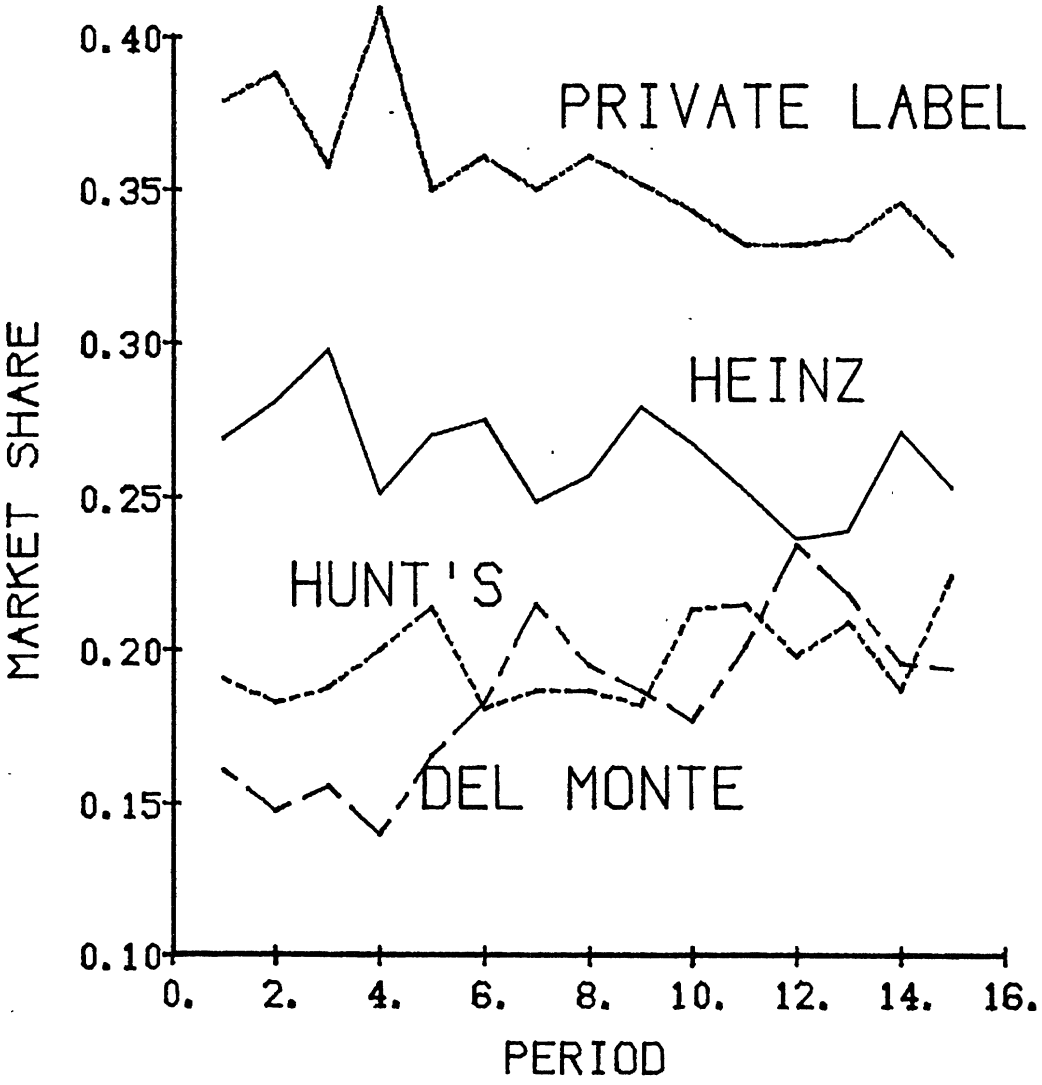


Figure 2

Market shares over time

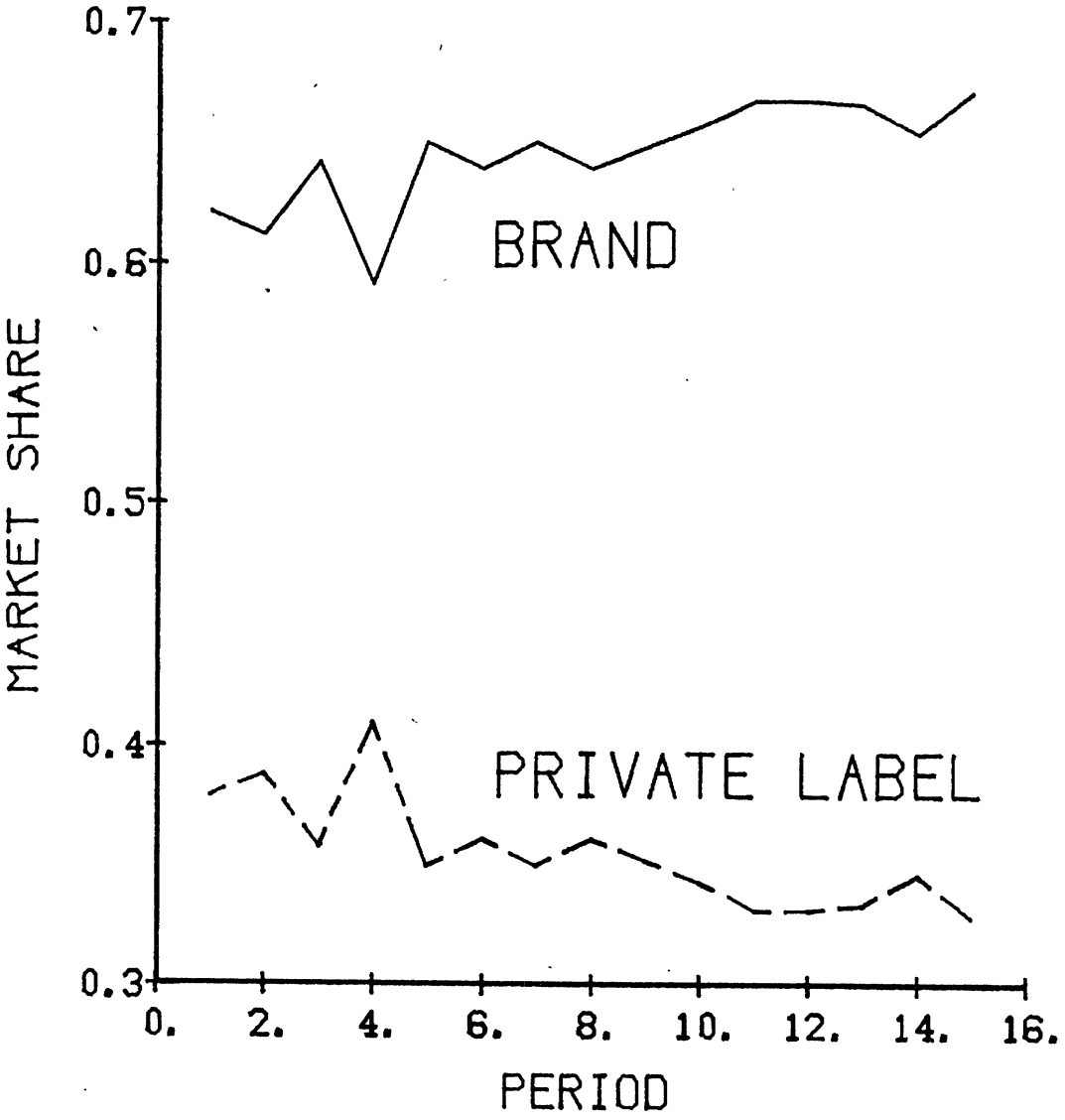


Figure 3

Brand name versus private label market share over time

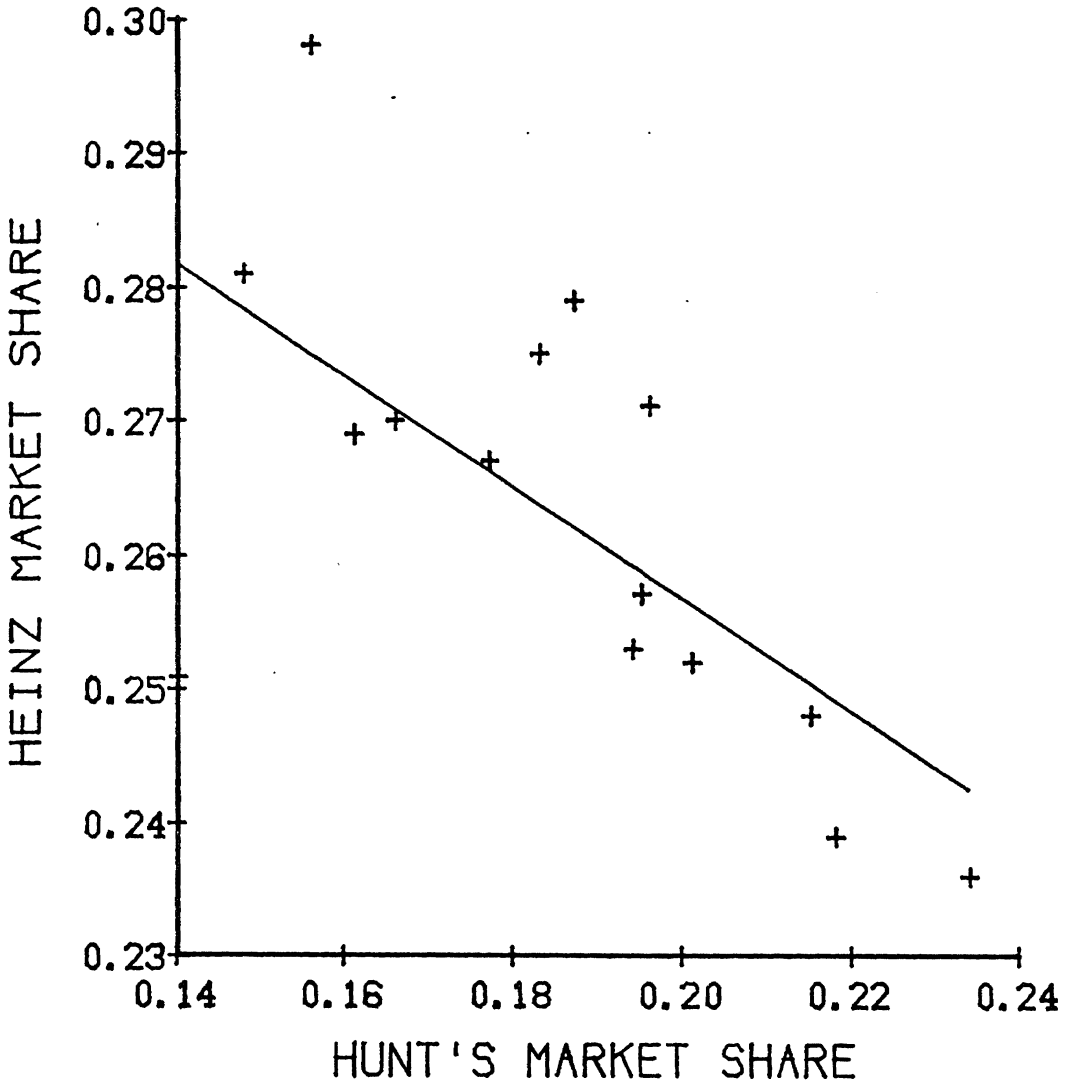


Figure 4

Heinz versus Hunts market share

```
<REGRESS VAR=MST.HZ,MST.HU>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 6.MST.HZ  N= 15 OUT OF 15

     SOURCE              DF   SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1   .17680 -2   .17680 -2   10.094      .0073
     ERROR               13   .22769 -2   .17515 -3
     TOTAL               14   .40449 -2

     MULT R= .66113  R-SQR= .43709 SE= .13234 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT                .34001      .24458 -1   13.902      .0000
   7.MST.HU        -.66113  -.41652      .13110     -3.1772      .0073

<SAVE V56=PREDICT LABEL=MST.HZHU>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  56.MST.HZHU     15     15      0*
```

Figure 5

Regression analysis of Heinz versus Hunts market share

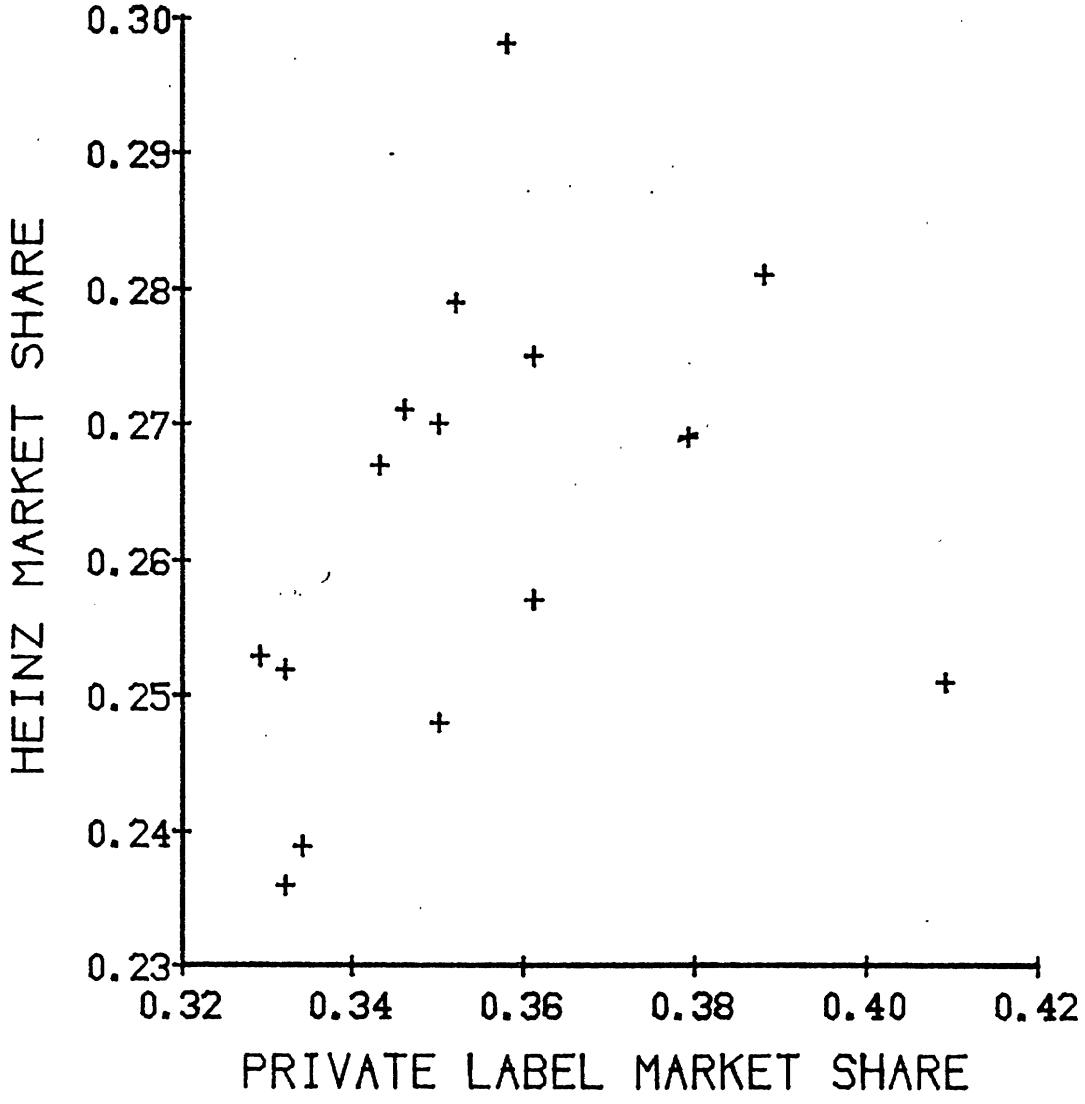


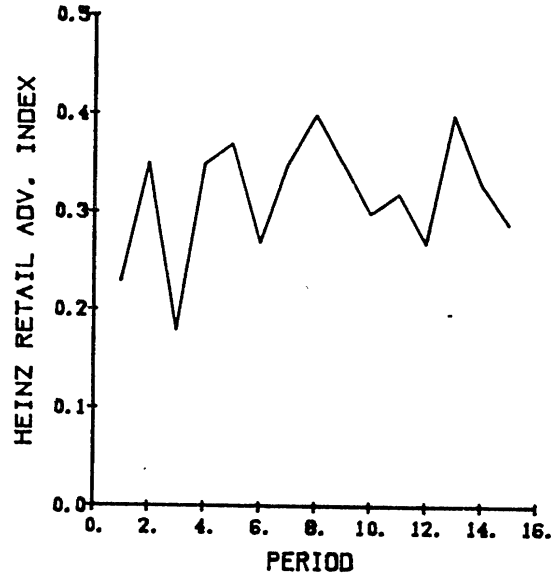
Figure 6

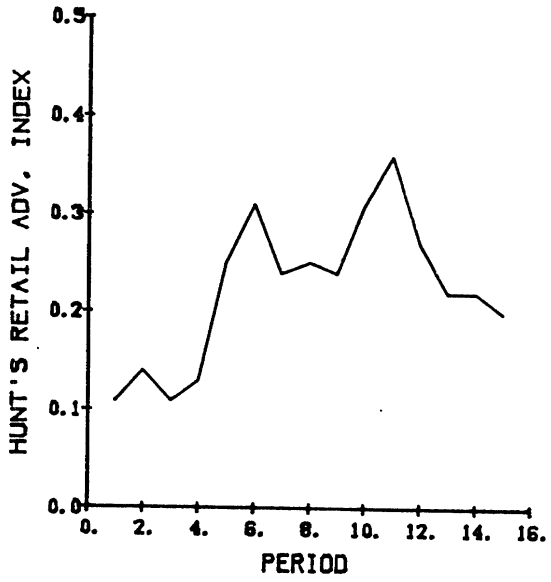
Heinz versus Other market share over time

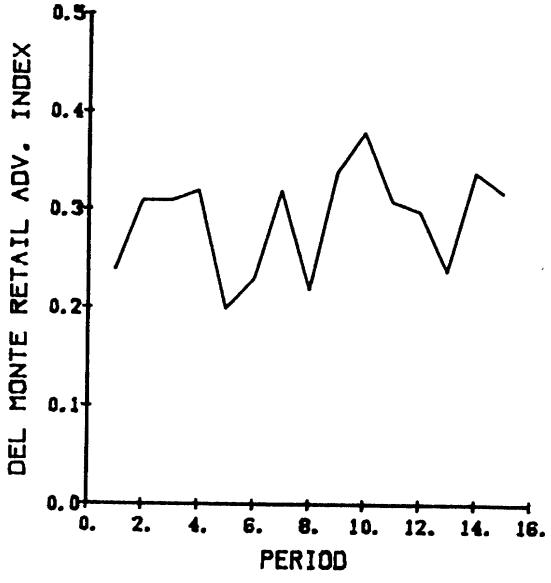
```
<REGRESS VAR=MST.HZ,MST.OT>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 6.MST.HZ  N= 15 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION           1  .42569 -3  .42569 -3  1.5290     .2381
     ERROR               13  .36192 -2  .27840 -3
     TOTAL               14  .40449 -2

     MULT R= .32441  R-SQR= .10524 SE= .16685 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT    SIGNIF

     CONSTANT                .17629     .70312 -1  2.5072     .0262
   9.MST.OT         .32441   .24450     .19773     1.2365     .2381

<SAVE V57=PREDICT LABEL=MST.HZOT>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  57.MST.HZOT     15     15      0*
```

Figure 7

Regression analysis of Heinz versus
Other market share over time







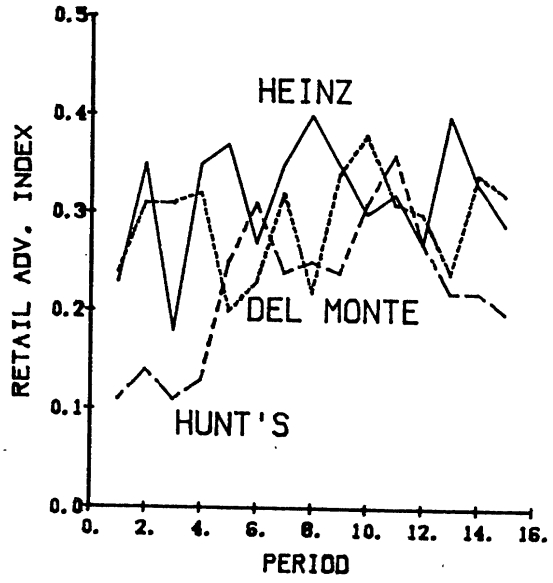
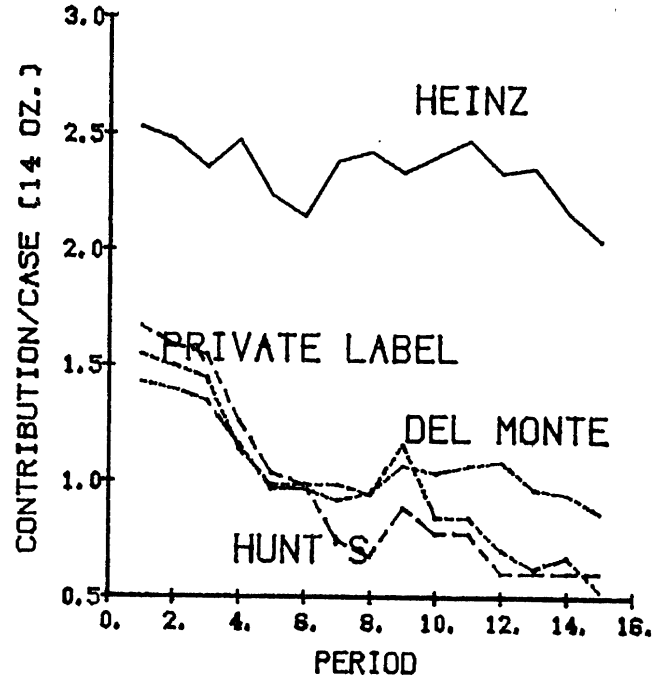


Figure 8

Retail advertising index over time



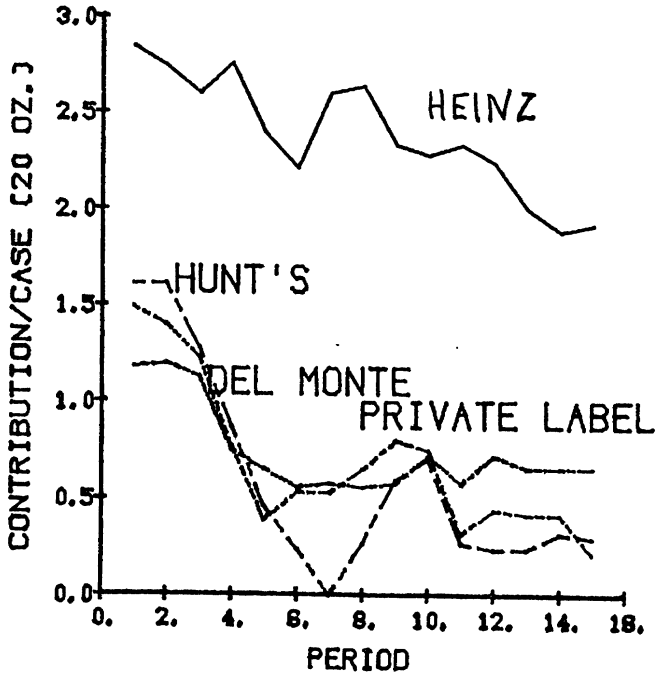
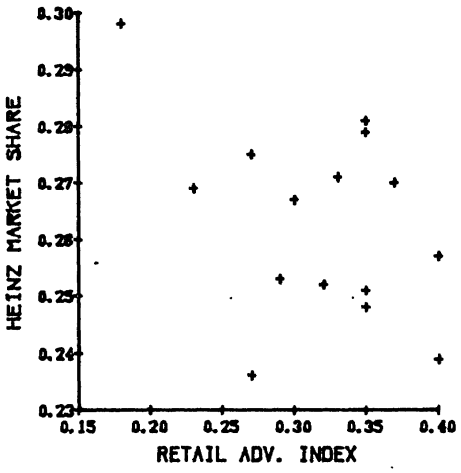
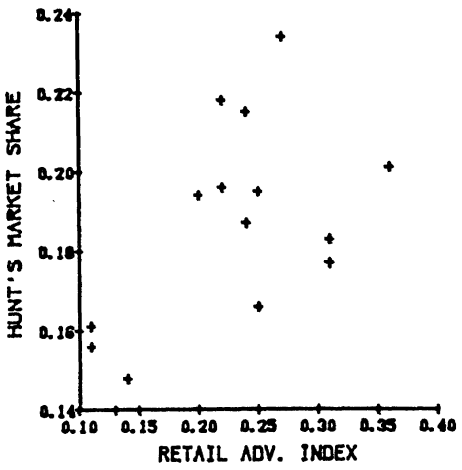


Figure 9

Contribution per case over time





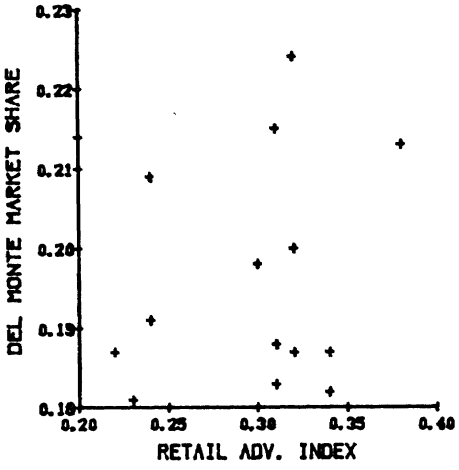


Figure 10

Advertising index versus market share

```
<REGRESS VAR=MST.HZ,RAT.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 6.MST.HZ  N= 15 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION           1  .73317 -3  .73317 -3  2.8780      .1136
     ERROR               13  .33118 -2  .25475 -3
     TOTAL               14  .40449 -2

     MULT R= .42574  R-SQR= .18126 SE= .15961 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT    SIGNIF

     CONSTANT                .30043     .22405 -1  13.409     .0000
  12.RAT.HZ        -.42574  -.11773     .69400 -1 -1.6965     .1136

<SAVE V58=PREDICT LABEL=MSRAT.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  58.MSRAT.HZ     15     15      0



<REGRESS VAR=MST.HZ,RAT.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 6.MST.HZ  N= 14 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION           1  .72887 -3  .72887 -3  2.7269      .1246
     ERROR               12  .32075 -2  .26729 -3
     TOTAL               13  .39364 -2

     MULT R= .43031  R-SQR= .18516 SE= .16349 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT    SIGNIF

     CONSTANT                .30509     .25394 -1  12.014     .0000
  12.RAT.HZ +1     -.43031  -.12766     .77310 -1 -1.6513     .1246
```

Figure 11

Regression analysis of advertising index versus market share

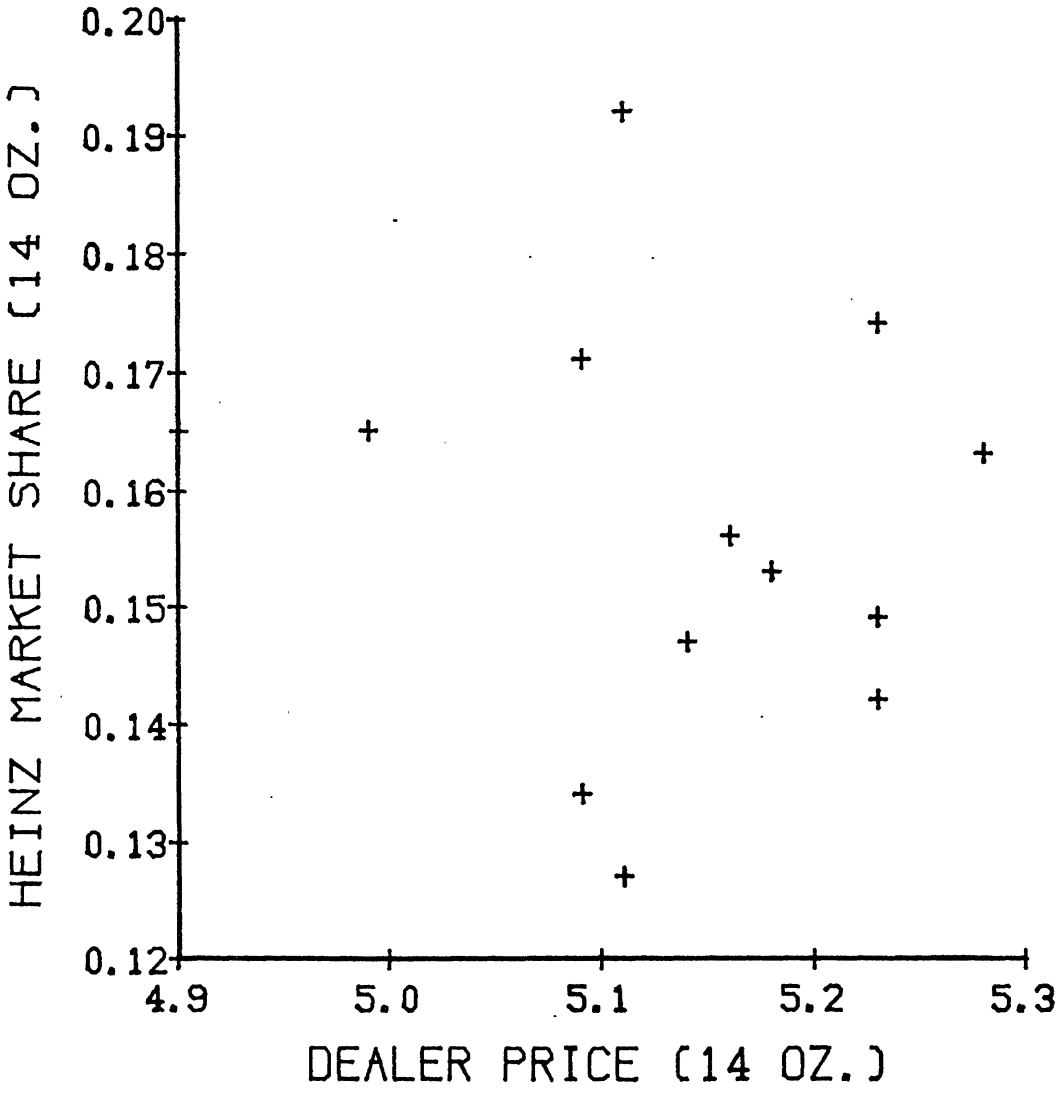


Figure 12

Dealer price 14 oz. versus market share

```
<REGRESS VAR=MS14.HZ,DP14.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .55855 -4  .55855 -4  .16822      .6896
     ERROR               11  .36525 -2  .33204 -3
     TOTAL               12  .37083 -2

     MULT R= .12273  R-SQR= .01506 SE= .18222 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT                .26225      .25724      1.0195      .3299
   2.DP14.HZ       -.12273  -.20547 -1  .50096 -1  -.41014      .6896


<REGRESS VAR=MS14.HZ,DP14.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .73561 -3  .73561 -3  2.7220      .1272
     ERROR               11  .29727 -2  .27024 -3
     TOTAL               12  .37083 -2

     MULT R= .44539  R-SQR= .19837 SE= .16439 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT               -.20480      .21920     -.93431      .3702
   2.DP14.HZ +1     .44539   .70811 -1  .42919 -1   1.6499      .1272


<REGRESS VAR=MS14.HZ,DP14.HZ(2)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .11510 -2  .11510 -2  4.9507      .0479
     ERROR               11  .25573 -2  .23249 -3
     TOTAL               12  .37083 -2


     MULT R= .55711  R-SQR= .31038 SE= .15247 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT               -.21802      .16850     -1.2939      .2222
   2.DP14.HZ +2     .55711   .73878 -1  .33203 -1   2.2250      .0479

<SAVE V61=PREDICT LABEL=MSDP1.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  61.MSDP1.HZ     15     13      2
```

Figure 13
Regression analysis of dealer price
14 oz. versus market share

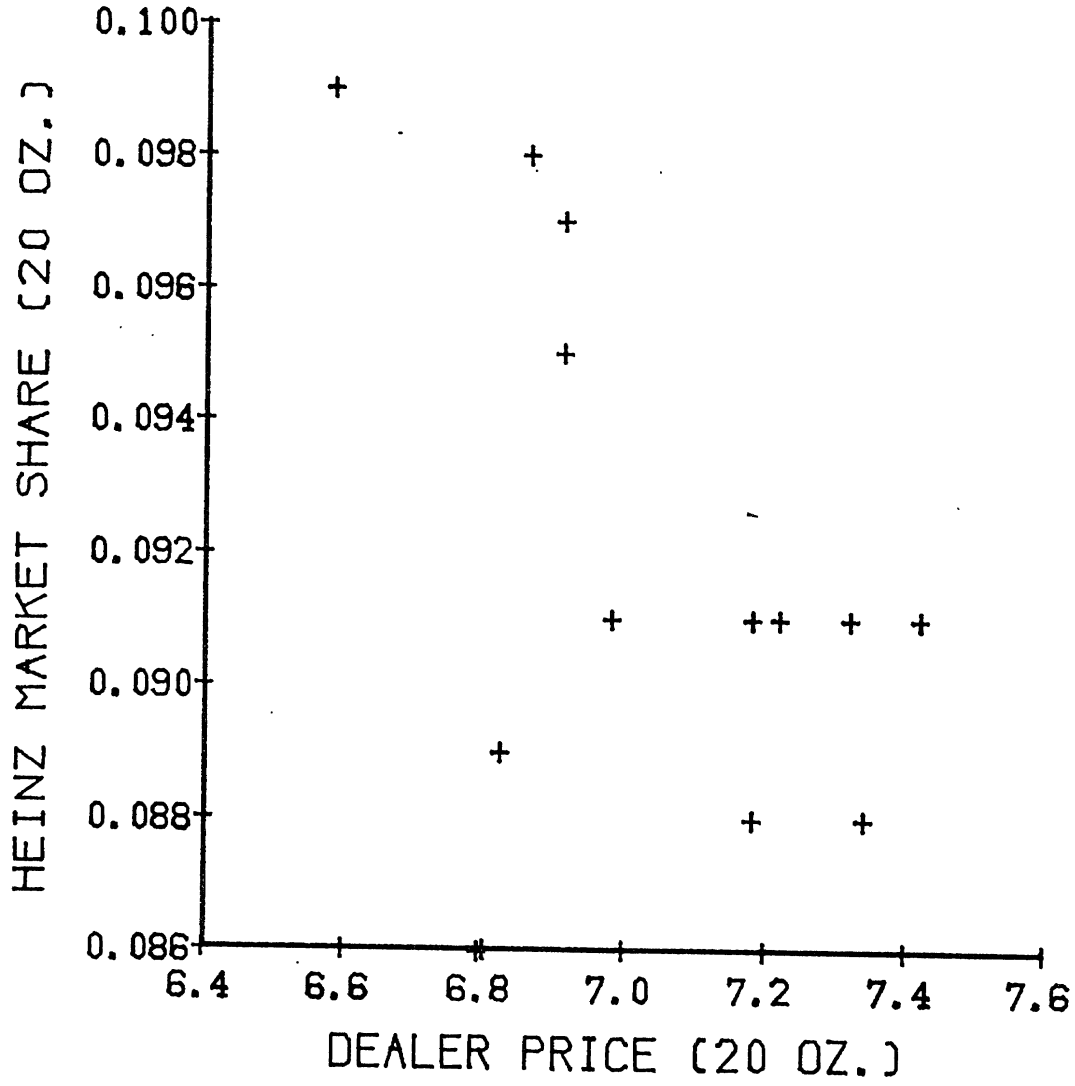


Figure 14

Dealer price 20 oz. versus market share

```
<REGRESS VAR=MS20.HZ,DP20.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .44224 -4  .44224 -4  3.1045      .1058
     ERROR               11  .15670 -3  .14245 -4
     TOTAL               12  .20092 -3

     MULT R= .46915  R-SQR= .22011 SE= .37743 -2


     VARIABLE     PARTIAL    COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .14504     .30165 -1  4.8083      .0005
  41.DP20.HZ      -.46915  -.75458 -2  .42826 -2 -1.7619      .1058


<REGRESS VAR=MS20.HZ,DP20.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .52115 -4  .52115 -4  3.8524      .0755
     ERROR               11  .14881 -3  .13528 -4
     TOTAL               12  .20092 -3

     MULT R= .50929  R-SQR= .25938 SE= .36780 -2


     VARIABLE     PARTIAL    COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .14504     .27079 -1  5.3559      .0002
  41.DP20.HZ +1   -.50929  -.76252 -2  .38849 -2 -1.9628      .0755

<SAVE V62=PREDICT LABEL=MSDP2.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  62.MSDP2.HZ     15     14      1


<REGRESS VAR=MS20.HZ,DP20.HZ(2)>
```

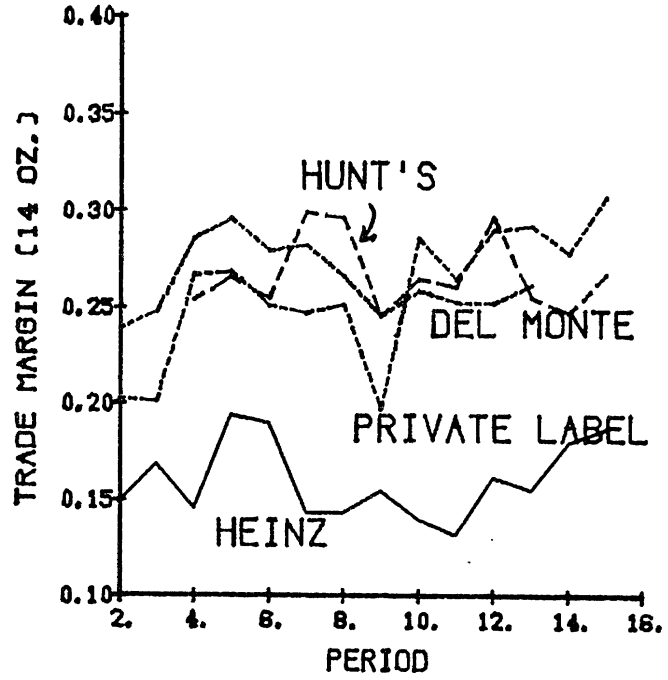
Figure 15

Regression analysis of dealer price
20 oz. versus market share

```
<REGRESS VAR=MS14.HZ,RAT.HZ,DP14.HZ(2),TM14.HZ,RP14.HZ(2)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ   N= 12 OUT OF 15

     SOURCE            DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION         4  .32465 -2   .81162 -3   13.535     .0021
     ERROR              7  .41977 -3   .59967 -4
     TOTAL             11  .36662 -2

     MULT R= .94101  R-SQR= .88551 SE= .77438 -2

     VARIABLE      PARTIAL     COEFF      STD ERROR    T-STAT    SIGNIF

     CONSTANT                 -1.5955     .34684     -4.6003     .0025
  12.RAT.HZ        .46872     .95679 -1   .68154 -1   1.4039     .2031
   2.DP14.HZ +2    .37288     .22693 -1   .21343 -1   1.0632     .3230
  33.TM14.HZ       .75225     .41985      .13899      3.0207     .0194
  16.RP14.HZ +2    .84179     .25495      .61792 -1   4.1259     .0044
```

Figure 16

Regression analysis of Heinz market share (14 oz.) versus multiple indepedent variables



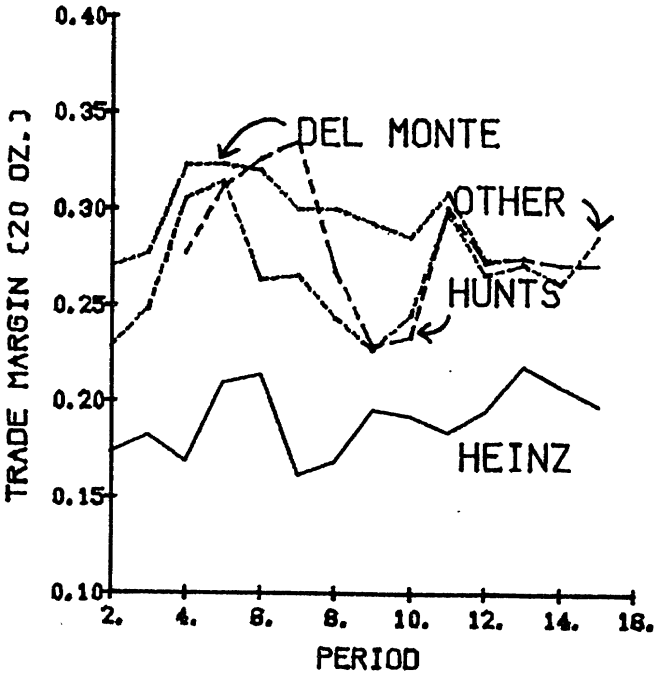


Figure 17

Trade margins over time

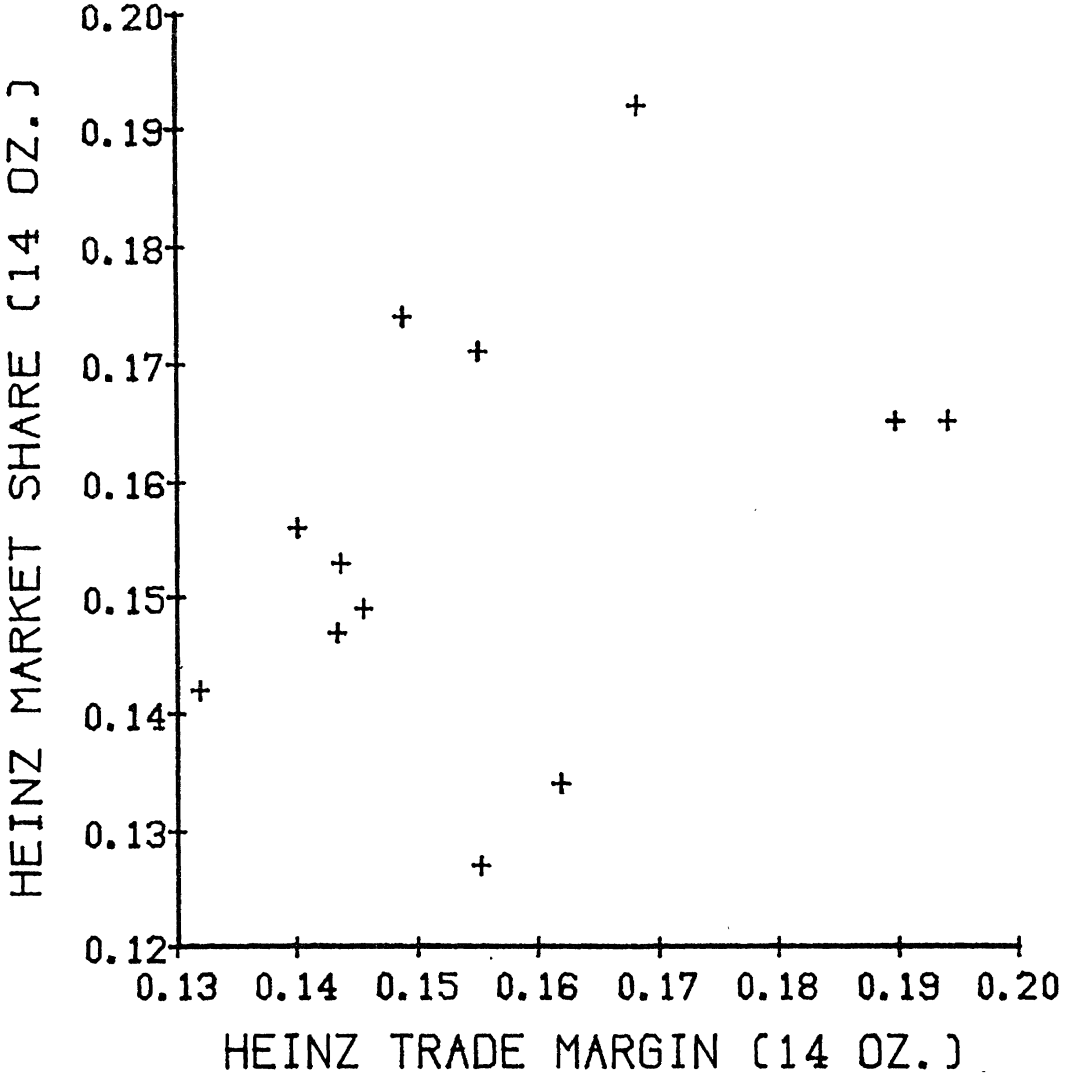


Figure 18

Trade margins 14 oz. versus market share

```
<REGRESS VAR=MS14.HZ,TM14.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 12 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .48379 -3  .48379 -3  1.5202      .2458
     ERROR               10  .31825 -2  .31825 -3
     TOTAL               11  .36662 -2

     MULT R= .36326  R-SQR= .13196 SE= .17839 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .10254      .43869 -1  2.3373      .0415
  33.TM14.HZ         .36326   .34342      .27853     1.2330      .2458

<SAVE V63=PREDICT LABEL=MSTM1.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  63.MSTM1.HZ     15     14      1


<REGRESS VAR=MS14.HZ,TM14.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .30672 -3  .30672 -3  .99188      .3407
     ERROR               11  .34016 -2  .30923 -3
     TOTAL               12  .37083 -2

     MULT R= .28760  R-SQR= .08271 SE= .17585 -1


     VARIABLE      PARTIAL     COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .19756      .41244 -1  4.7900      .0006
  33.TM14.HZ +1   -.28760  -.25778      .25884     -.99593      .3407
```

Figure 19

Regression analysis of trade margins
14 oz. versus market share

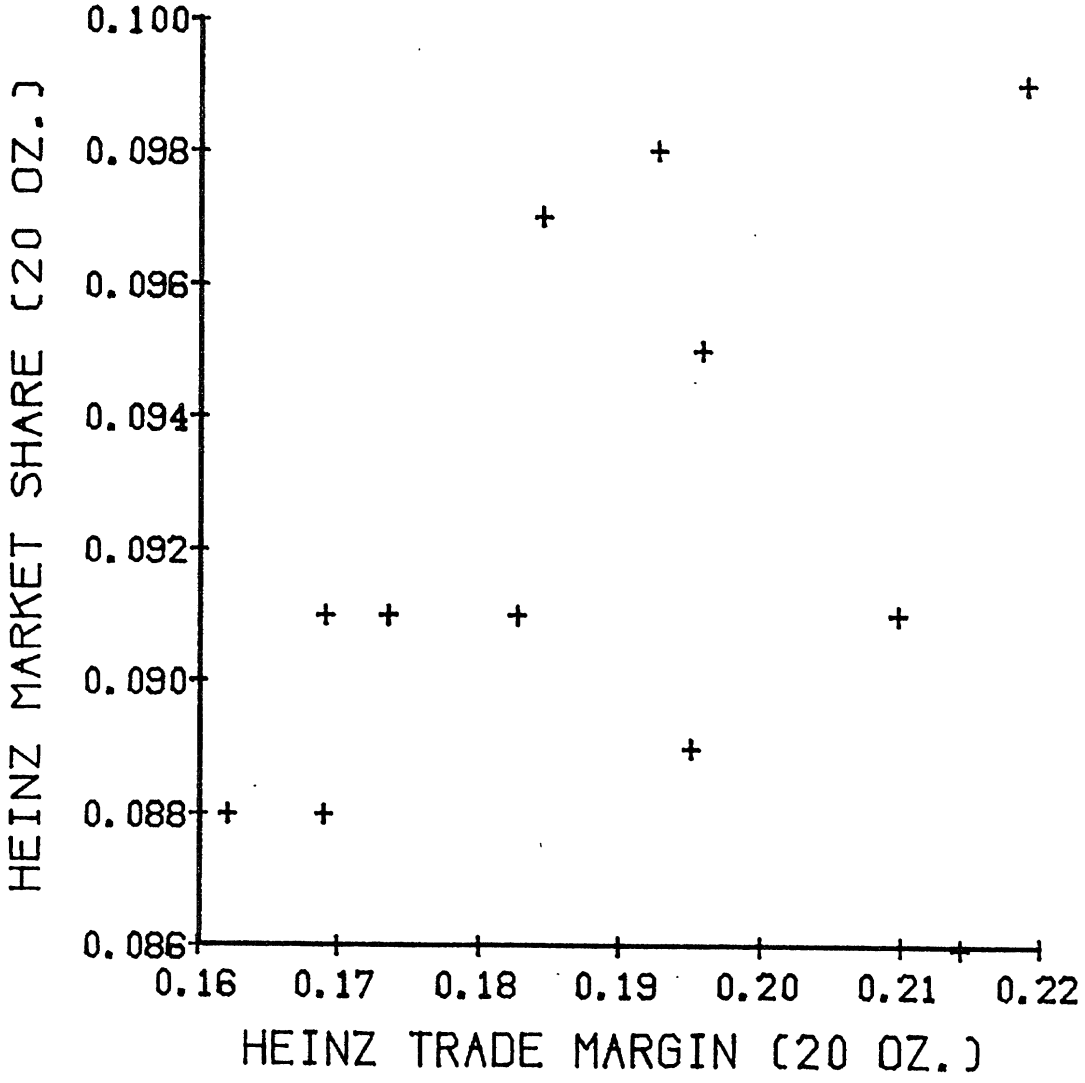


Figure 20

Trade margins 20 oz. versus market share

```
<REGRESS VAR=MS20.HZ,TM20.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 12 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .18582 -4  .18582 -4  1.0243      .3354
     ERROR               10  .18142 -3  .18142 -4
     TOTAL               11  .20000 -3

     MULT R= .30481  R-SQR= .09291 SE= .42593 -2


     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .78938 -1  .12965 -1  6.0886      .0001
  45.TM20.HZ        .30481   .69161 -1  .68338 -1  1.0121      .3354

<SAVE V64=PREDICT LABEL=MSTM2.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  64.MSTM2.HZ     15     14      1


<REGRESS VAR=MS20.HZ,TM20.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .12427 -4  .12427 -4  .72518      .4126
     ERROR               11  .18850 -3  .17136 -4
     TOTAL               12  .20092 -3

     MULT R= .24869  R-SQR= .06185 SE= .41396 -2


     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .81611 -1  .12164 -1  6.7094      .0000
  45.TM20.HZ +1     .24869   .54171 -1  .63613 -1  .85157      .4126
```

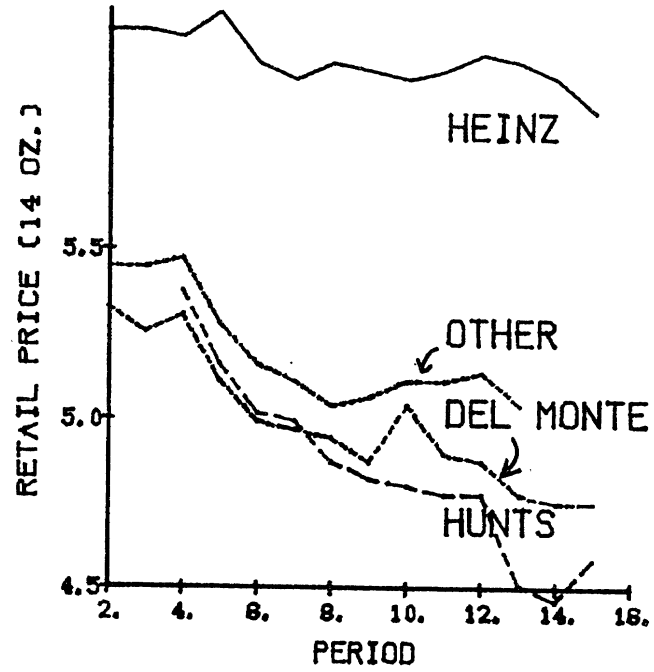
Figure 21

Regression analysis of trade margins
20 oz. versus market share

```
<REGRESS VAR=MS20.HZ,RAT.HZ(1),DP20.HZ(1),TM20.HZ,RP20.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 12 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           4  .12701 -3  .31753 -4  3.0454      .0946
     ERROR                7  .72987 -4  .10427 -4
     TOTAL               11  .20000 -3

     MULT R= .79691  R-SQR= .63507 SE= .32290 -2

     VARIABLE      PARTIAL    COEFF     STD ERROR   T-STAT     SIGNIF

     CONSTANT                .28286     .70929 -1  3.9879      .0053
  12.RAT.HZ +1     -.60338  -.32031 -1  .16001 -1 -2.0019      .0854
  41.DP20.HZ +1     .03321   .56474 -3  .64229 -2  .87926 -1  .9324
  45.TM20.HZ       -.35621  -.70054 -1  .69456 -1 -1.0086      .3467
  37.RP20.HZ +1    -.60431  -.19949 -1  .99410 -2 -2.0067      .0848
```

Figure 22

Regression analysis of Heinz market share (20 oz.) versus multiple indepedent variables



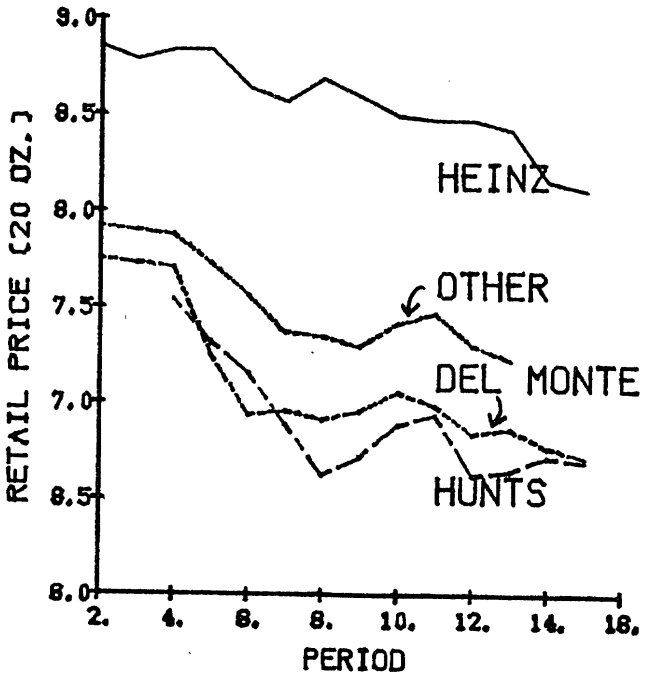


Figure 23

Retail price over time

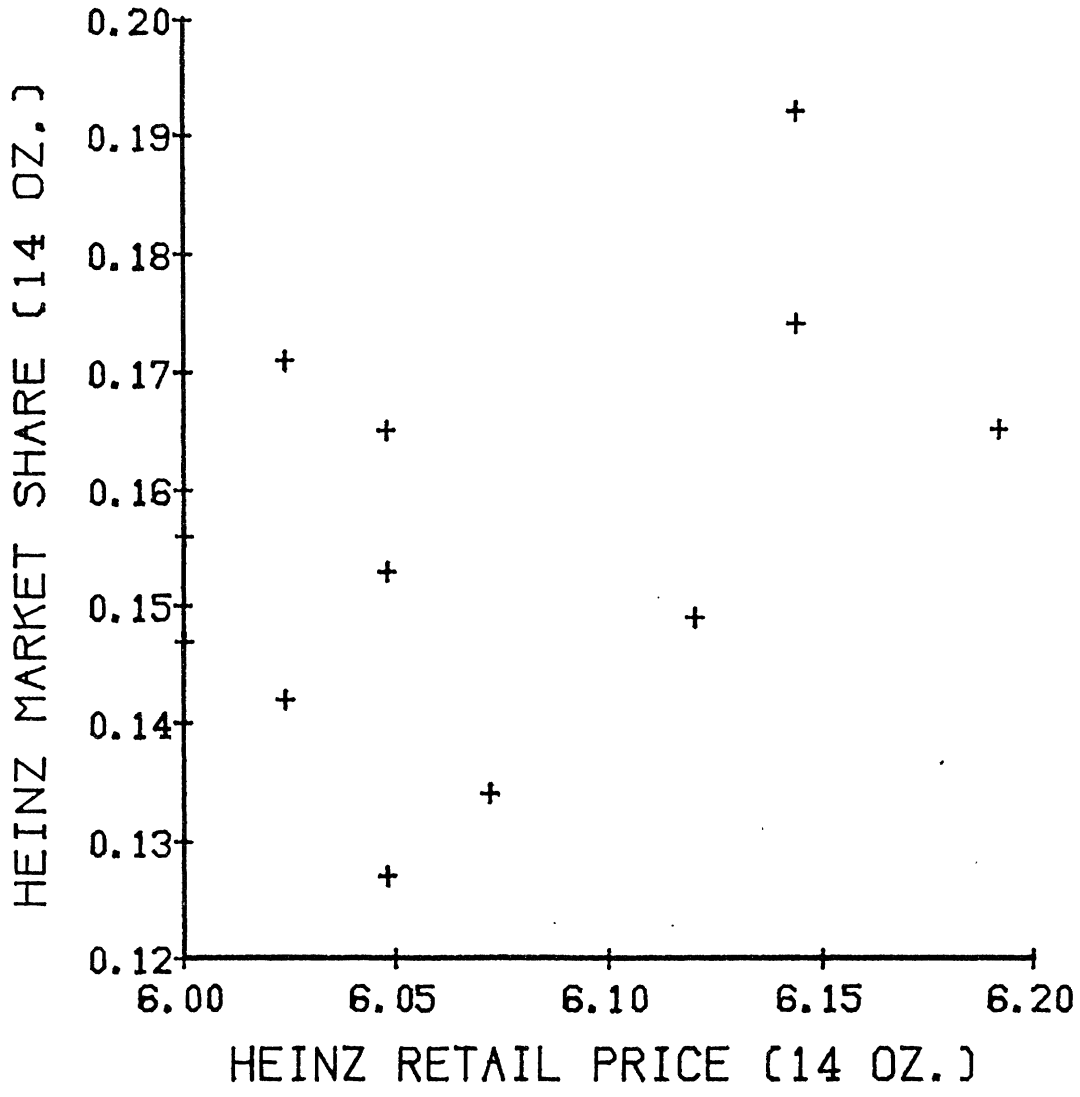


Figure 24

Retail price 14 oz. versus market share

```
<REGRESS VAR=MS14.HZ,RP14.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 12 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .76422 -3  .76422 -3  2.6334      .1357
     ERROR               10  .29020 -2  .29020 -3
     TOTAL               11  .36662 -2

     MULT R= .45656  R-SQR= .20845 SE= .17035 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT                -.64603     .49441     -1.3067     .2206
  16.RP14.HZ        .45656    .13213     .81420 -1   1.6228     .1357


<REGRESS VAR=MS14.HZ,RP14.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .29352 -3  .29352 -3  .94550      .3518
     ERROR               11  .34148 -2  .31044 -3
     TOTAL               12  .37083 -2

     MULT R= .28134  R-SQR= .07915 SE= .17619 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT                -.31487     .48506     -.64913     .5296
  16.RP14.HZ +1     .28134    .77745 -1  .79954 -1   .97237     .3518


<REGRESS VAR=MS14.HZ,RP14.HZ(2)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 10.MS14.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT     SIGNIF

     REGRESSION           1  .22143 -2  .22143 -2  16.304      .0020
     ERROR               11  .14940 -2  .13582 -3
     TOTAL               12  .37083 -2


     MULT R= .77274  R-SQR= .59712 SE= .11654 -1


     VARIABLE      PARTIAL    COEFF     STD ERROR    T-STAT     SIGNIF

     CONSTANT                -.96373     .27752     -3.4726     .0052
  16.RP14.HZ +2     .77274    .18527     .45884 -1   4.0378     .0020

<SAVE V65=PREDICT LABEL=MSRP1.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  65.MSRP1.HZ     15     13      2
```

Figure 25

Regression analysis retail price 14 oz. versus market share

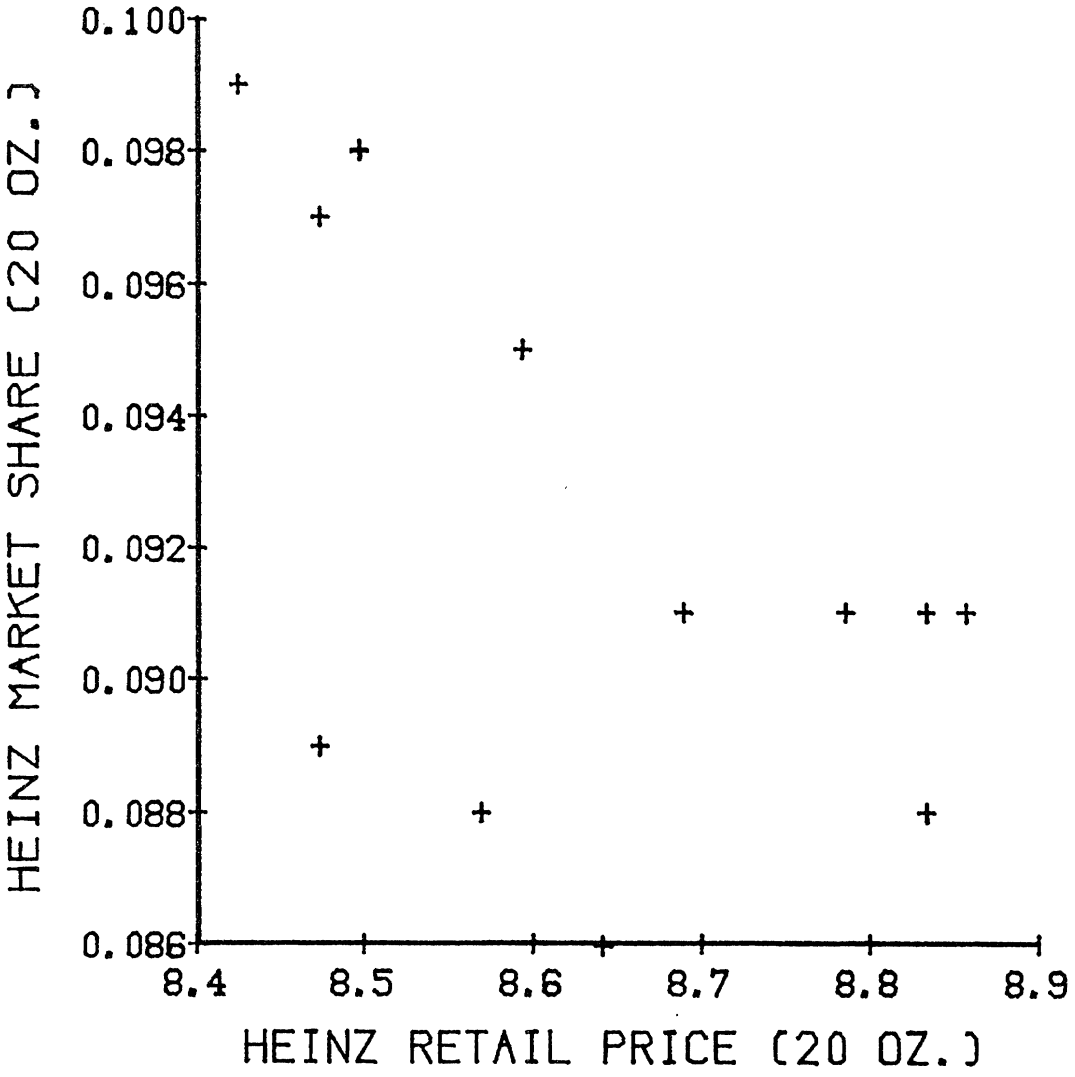


Figure 26

Retail price 20 oz. versus market share

```
<REGRESS VAR=MS20.HZ,RP20.HZ>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 12 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION           1  .56396 -4  .56396 -4  3.9271      .0757
     ERROR               10  .14360 -3  .14360 -4
     TOTAL               11  .20000 -3

     MULT R= .53102  R-SQR= .28198 SE= .37895 -2


     VARIABLE     PARTIAL    COEFF     STD ERROR   T-STAT    SIGNIF

     CONSTANT                .21577    .62464 -1  3.4542      .0062
  37.RP20.HZ      -.53102  -.14328 -1  .72302 -2 -1.9817      .0757


<REGRESS VAR=MS20.HZ,RP20.HZ(1)>

LEAST SQUARES REGRESSION

ANALYSIS OF VARIANCE OF 11.MS20.HZ  N= 13 OUT OF 15

     SOURCE              DF  SUM SQRS    MEAN SQR    F-STAT    SIGNIF

     REGRESSION           1  .75692 -4  .75692 -4  6.6487      .0257
     ERROR               11  .12523 -3  .11385 -4
     TOTAL               12  .20092 -3

     MULT R= .61378  R-SQR= .37672 SE= .33741 -2


     VARIABLE     PARTIAL    COEFF     STD ERROR   T-STAT    SIGNIF

     CONSTANT                .19931    .41657 -1  4.7845      .0006
  37.RP20.HZ +1   -.61378  -.12485 -1  .48419 -2 -2.5785      .0257

<SAVE V66=PREDICT LABEL=MSRP2.HZ>

PREDICT USING: REGRESS

     VARIABLE  TOTAL  VALID   MISS

  66.MSRP2.HZ     15     14      1
```

Figure 27

Regression analysis retail price 20 oz. versus market share