Case Problem
Due Sunday, October 12 by midnight

Note: you may either complete this assignment:
   i)   alone, or
   ii) as part of a joint submission with your Discussion Board student group.

MARKET STRUCTURE ANALYSIS AT COLUMBIA DRUGSTORES, INC.

Background:

Demonstrating the tools and techniques of market structure analysis is made difficult by the fact that a firm's competitive strategy is largely based upon proprietary data. Firms jealously guard price, market share, and profit information for individual markets. No one should expect Target, for example, to disclose profit-and-loss statements for various regional markets or on a store-by-store basis. Competitors like Wal-Mart would love to have such information available. It would provide a guide for their own profitable market entry and store expansion decisions.

To see the process that might be undertaken to develop a better understanding of product demand conditions, consider the hypothetical example of Columbia Drugstores, Inc., based in Seattle, Washington. Assume Columbia operates a chain of 30 drugstores in the Pacific Northwest. During recent years, the company has become increasingly concerned with the long-run implications of competition from a new type of competitor, the so-called superstore.

To measure the effects of superstore competition on current profitability, Columbia asked you to conduct a statistical analysis of the company's profitability in its various markets. To net out size-related influences, profitability was measured by Columbia's gross profit margin, or earnings before interest and taxes divided by sales. Columbia provided you with proprietary company profit, advertising, and sales data covering the last year for its 30 stores, along with public trade association and Census Bureau data concerning the number and relative size distribution of competitors in each market, among other market characteristics.

You have decided to conduct a regression-based analysis of the various factors thought to affect Columbia's profitability. To aid you in this process, Columbia created the accompanying spreadsheet entitled "Case_Data.xlsx." The data contained in this spreadsheet are described as follows, where the variable name (as it appears in the spreadsheet) is in italics.

The variable *Store Number* identifies a particular Columbia drugstore. The dependent variable is *Profit Margin*, which as stated before, is Columbia's gross profit margin. The following independent variables are thought to affect Columbia's profitability. The variable *Market Share* is the relative size of leading competitors in a store's market, measured at the Standard Metropolitan Statistical Area (SMSA) level. Columbia's market share in each area is expected to have a positive effect on profitability. The *Market Concentration Ratio*, measured as the combined market share of the four largest competitors in any given market, is expected to have a negative effect on Columbia's profitability given the stiff competition from large, well-

financed rivals. Both *Capital Intensity*, measured by the ratio of the book value of assets to sales, and *Advertising Intensity*, measured by the advertising-to-sales ratio, are expected to exert positive influences on profitability. *Growth*, measured by the geometric mean rate of change in total disposable income in each market, is expected to have a positive influence on Columbia's profitability, because some disequilibrium in industry demand and supply conditions is often observed in rapidly growing areas. Finally, to gauge the profit implications of superstore competition, the variable *Superstore Dummy* takes the value of '1' if Columbia faced superstore competition in a particular store's market and '0' otherwise.

<u>Assignment</u>:

In five-to-seven pages of double-spaced writing in a Word document, answer the following questions:

1. Based on the text above, build a multiple linear regression *population* model to analyze the impact of the preceding determinants on Columbia's profitability. What is the multiple linear regression *population* equation? What are the assumptions underlying the model?

2. Using Excel and the accompanying dataset, estimate the population model. Copy and paste your Excel output into your Word document.

3. Based on the Excel output, what is the estimated regression equation?

4. Interpret *all* coefficient estimates. Identify the significance level for *all* of these estimates. Are any of the independent variables likely to *actually* influence Columbia's profitability? Are your estimates consistent or inconsistent with the *a priori* conjunctures found in the article? (*E.g.*, advertising intensity is thought, *a priori*, to increase profit margin. Does your coefficient on advertising intensity and its associated *p*-value suggest that it is directly correlated with profit margin?)

5. What portion of the variability in profit margin is explained by variability in the independent variables? Is the estimated regression equation a good fit for explaining profit margin?

6. Based on the estimate of the coefficient on *Superstore Dummy* and its associated *p*-value, do you believe that superstores pose a threat to Columbia's profitability? Expand on the theoretical foundation for this conclusion, *i.e.*, why would the existence of competitor superstores affect Columbia's profitability?