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SIMULATING BUSINESS DECISION-MAKING: USING STATISTICAL CASES FOR CLASSROOM EXERCISES

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ABSTRACT

Business decision making can be greatly enhanced by the use of statistics when managers are more attuned to viewing statistics as a tool of negotiation -rather than strictly a science of numerical calculations. The paper demonstrates the difference between the traditional examples of applied statistics textbooks versus an case scenario approach. A specific example is given to illustrate the procedure.

INTRODUCTION

The use of statistical logic in business decision making could be greatly expanded if businessmen and future businessmen (students) could understand that many of their discussions could be more clearly focused through the use of statistics. Unfortunately, statistical courses generally fail to bridge the gap between statistical nomenclature and business terms. Rather statistical courses generally focus on the calculation of terms, which are seldom addressed in a business discussion. Seldom will one ever hear a businessmen ask a colleague, ~ the R-squared value for that least squares regression line?"

Most collegiate statistics books follow a prescribed format for statistical presentations. Students routinely follow mathematical calculations designed to answer specifically asked statistical questions. This observation can be made even when the statistics books are replete with "business examples". To illustrate this observation, an example from Statistics for Business and Economics by McClave and Benson (1988) describes a company that services micro-computers that is interested in developing a regression model that will assist them in manpower planning. In particular, they want a model that describes the relationship between the time a service person spends on a preventive maintenance service call to a customer, y, and two independent variables: the number of microcomputers to be serviced, xl, and the service person's number of months of experience in preventive maintenance, x2. A sample of the resulting questions posed by the text follows.

(a) Fit the model $Y = B_o + B_1 X_1 + B_2 X_2$. to the data.
(b) Investigate whether the model is useful. Test using alpha = .10.
(c) Fit the model $y = B_o + B_1 X_1 + B_2 X_2 + B_3 X_1 X_2$ the data.
(g) Do the data provide sufficient evidence to indicate that the interaction, xl*x2, con- tributes information for the prediction of y?

SIMULATED BUSINESS CASE EXAMPLE

As an example, the case and questions were rewritten (Knight 1990) as managerial simulated managerial situations (some examples of which follow). A complete description of this case and others can be found in the Knight reference.

Situation #1. Because of the time study analysis, the repairmen felt that an unfair expectation would be placed on them. After a group meeting, they suggested that a time standard be developed which found the average maintenance time per computer and then add 20% to allow for special problems that may come up on the job. What repair time per computer would they have suggested?

Situation #2. Although the proposal seemed fair on the surface, manager felt that the figure was fair for "one computer" but what if the job had "multiple computers". How much time should be allowed so as to be 70% sure the job could be finished in less than the allotted time?

Situation #3. Using the formula "total time" = 2.41 + 1.43 (no. of computers) - 0.36)6 (no. of months experience), the company wanted to knot the average time it would take for a repairman to complete a job if the job had 6 microcomputers and the repairman had 8 months of experience.

Situation #4. One manager claimed that the formula implied that the incremental time to complete an additional computer was constant regardless of the amount of experience that the repairman had. He suggested that each incremental computer would take less time if a repairman had more experience. If this wasn't so, why should the company be giving higher pay if they were no more capable than a new repairman?

Differences in "Applications"

The questions posed in the standard text example were statistical in nature but did little in regards to showing the true application to business and management. The questions that were posed in the standard text have been reworked to become typical managerial'' situations that could be more clearly understood when statistics are applied. Many sample cases are available from the author.

Conclusions

Business statistics can be one of the most exciting topics for a student or a businessman to learn because it dramatically increases his ability to negotiate through logic. However, most business statistics problems, although said to be applications, do not present this particular approach. Problems can be developed however, that simulate reasonable managerial arguments that can be addressed with the proper application of statistics.

REFERENCES

(1) Statistics for Business and Economics, McClave, James T. and Benson, George, Dellen Publishing Company, San Francisco, Ca. 1988.

(2) Statistical Cases In Business, Management, and Marketing, Knight, John, 11Th Print Shop, Martin, Tenn., 1990.