Objective of Regression analysis is to explain variability in dependent variable by means of one or more of independent or control variables.

Applications

There are four broad classes of applications of regression analysis.

* Descriptive or explanatory: interest may be on describing “What factors influence vari- ability in dependent variable?” For example, factor contributing to higher sales among company’s sales force.
* Predictive, for example setting normal quota or baseline sales. We can also use estimated equation to determine “normal” and “abnormal” or outlier observations.
* Comparing Alternative theoretical explanations,  
  – Consumers use reference price in comparing alternatives,

– Consumers use specific price points in comparing alternatives.

* Decision purpose,

– Estimating variable and fixed costs having calibrated cost function.  
– Estimating sales, revenues and profits having calibrated demand function. – Setting optimal values of marketing mix variables.  
– Using estimated equation for “What if” analysis.

Data Requirement

* + Measurement on two or more variables one of which must be dependent.
  + Dependent variable must have interval or ratio scale measurement.
  + If independent variables are nominal scaled (e.g. brand choice), then appropriate caution must be maintained so that results from analysis can be interpreted. For example, it may be necessary to create variables that take values 0 and 1 or dummy variables.

Steps in Regression Analysis

1. Decide on purpose of model and appropriate dependent variable to meet that purpose. 2. Decide on independent variables.

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Multivariate Research Methods Course: COST\*6060

Regression Analysis 2

1. Estimate parameters of regression equation.
2. Interpret estimated parameters, goodness of fit and qualitative and quantitative assess- ment of parameters.
3. Assess appropriateness of assumptions.
4. If some assumptions are not satisfied, modify and revise estimated equation.
5. Validate estimated regression equation.

We will examine these steps with the assumption that purpose of model is already been decided and we need to perform remaining steps.

Decision about Independent Variables

Here are some suggestion for variable(s) to be included in regression analysis as independent variables.

• Based on theory.

– Economic, sales is a function of price,  
– Psychological, behavioural intention and attitude toward a product, – Biological, fertilizer usage, generally increase plant growth.

• Prior research,

– Replicate findings for earlier efforts.  
– Extend results for alternative product category. – Bring new insights to earlier efforts.

• Educated “Guesses”, good idea or common sense. • Statistical approaches.

* –  Stepwise Forward, add a variable that contributes most to explaining dependent variable, continue this, until either no variables are left to add or none of remaining variables contribute in explaining variation in dependent variable.
* –  Stepwise Backward, add all variables to the model and remove one variable at a time, starting with one that explains least amount of variation in dependent variable.
* –  All Subset, estimate all combinations containing two variables at a time, then three variables at a time etc. Then, choose a subset that has most stable set of independent variables.