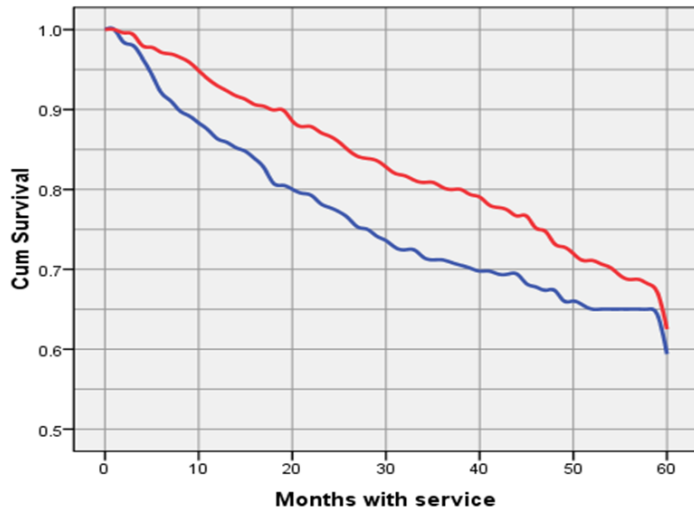


## IBM SPSS Advanced Statistics

IBM SPSS Advanced Statistics is an extremely 'analytically rich' SPSS Statistics module. Advanced Statistics includes a very wide range of multivariate procedures for investigating complex relationships in data.

- A number of the procedures in IBM SPSS Advanced Statistics are relatively technical in a statistical sense. In particular, Advanced Statistics encompasses General and *Generalized* Linear Modelling capabilities.
- General Linear Models allow you to model relationships and interactions between many factors. The general linear model incorporates a number of different statistical models: ANOVA, MANOVA, ANCOVA, Repeated Measures etc.
- An example of GLM would be one where we wish to see if males spend more money on average in a particular store than females when they have been given a particular discount coupon. The model can be made more complicated if we include more than one type of coupon or test to see whether region or age makes a difference.
- Generalized Linear Models are an extension of General Linear Models in that they are able to work with a greater range of data distributions. In particular, the model allows for the dependent variable to have a non-normal distribution.
- The Generalized Estimating Equations (GEE) procedure extends the generalized linear model to allow for analysis of repeated measurements or other correlated observations, such as clustered data.
- *Advanced Statistics* also includes *Linear Mixed Models*. If you work with data that display correlation and non-constant variability, such as nested data that represent students within faculties or employees within departments, you can use the linear mixed models procedure to model means, variances, and covariances in your data.
- *Advanced Statistics* includes General Loglinear and LOGIT Loglinear analysis.
- *Advanced Statistics* also includes a number of *Survival Analysis* algorithms. Survival analysis is traditionally used to model the effect of factors over time on mortality or equipment failure. In recent times, Survival Analysis has also been used in applications such as insurance claims and customer churn. Survival analysis attempts to answer questions such as: what is the fraction of a population which will survive past a certain time? Of those that survive, at what rate will they die or become ill?
- *Advanced Statistics* offers 4 distinct Survival Analysis procedures:
  - Life Tables
  - Kaplan-Meier
  - Cox Regression
  - Cox Regression with time-dependent covariate

Survival Function



• Unmarried customers churn sooner