
# Modeling Left Censored Data from a Dynamic Reliability System.

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**Abstract:**
In many real multicomponent systems, the failure of a component affects the remaining components and the usual assumption that components which are part of a system work independently seems not appropriate in a number of applications. However, dynamic models such as the load-share model are deemed more realistic in environments where a component's performance can change depending on the working status of the other. Here load sharing refers to a model of stochastic interdependency between components that operate within the system. A lot of interest is shown on how the component failure rates are affected. In a typical load-sharing system, once a component fails, the remaining components experience a change in failure rate which happens due to the failed component. The rule that governs how failure rates change after some components in the system fail depends on the system structure function. However, when you have left censored data, the failure rate is of limited use and it is more meaningful to use the reversed hazard rate proposed as a dual to the hazard rate instead. In the present study, we propose a model for left censored bivariate data enjoying the load share dependence, based on reversed hazard rates. The model proposed is a bivariate proportional reversed hazards model apt to model data with load share dependence. We develop characterisations of the model. The maximum likelihood method of estimation is shown to work well. The Bayesian approach to the estimation of parameters is also adopted. The complexity of the likelihood function is handled through the Metropolis - Hasting algorithm. This is executed with the MH adaptive package in r. Applications of this model is demonstrated by illustrating the usefulness of the model in analysing real data.

Keywords:
Load share models, Proportional reversed hazard rate, Maximum likelihood, Bayesian estimation, Metropolis-Hastings algorithm.