

Regression modelling may be used for description, inference, or forecasting/prediction:

1. Description aims at finding the best functional relationship among variables in the model, and estimating its parameters, based on available data. In mathematics, a function $y = f(x)$ is a rule of correspondence, often written as an equation, that associates with each value of x one and only one value of y . [...]

2. Inference means generalizing the results of a set of observations to the whole target population, as represented by a sample drawn from that population. Inference may consist in estimating the confidence intervals within which the true values of the statistical population parameters are likely to be found, or testing a priori hypotheses about the values of model parameters in the statistical population. (1) The ecological hypotheses may simply concern the existence of a relationship (i.e. the slope is different from 0), and/or it may state that the intercept is different from zero. (2) In other instances, the ecological hypothesis concerns the sign that the relationship should have. (3) There are also cases where the ecological hypothesis states specific values for the parameters. [...]

3. Forecasting (or prediction) consists in calculating values of the response variable using a regression equation. Forecasting (or prediction) is sometimes described as *the* purpose of ecology. In any case, ecologists agree that empirical or hypothesis-based regression equations are helpful tools for management. This objective is achieved by using the equation that minimizes the residual mean square error, or maximizes the coefficient of determination (r^2 in simple regression; R^2 in multiple regression). [...]

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