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Testing regression models with selection-biased data

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Abstract In this paper, we study integrated regression techniques to check the adequacy of a given model in the context of selection-biased observations. We introduce integrated regression in this setting, providing not only a suitable statistic for enabling a model checking test, but also a bootstrap distributional approximation to carry out the test. We also address the behaviour of the test under different alternatives showing that this behaviour is asymptotically the same for both selection-biased and non selection-biased data. The technique is illustrated with a simulation study and a data analysis based on a real situation that shows the performance of the method and how selection bias affect both estimation and inference.

Keywords Bootstrap · Goodness of fit · Integrated regression ·
Selection-biased data · Marked empirical process