



## **Nonparametric Item Response Theory and Cluster Analysis to study patterns of Information and Communication Technologies Adoption in Brazil companies**

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Information and Communication Technologies (ICTs) have assumed an increasingly important role in business development. The observation of the firm's characteristics can provide relevant elements to assess how technologies could increase the competitiveness of companies. In this study, nonparametric Item Response Theory was used in the survey questionnaire to define relevant dimensions to be used in a subsequent cluster analysis. After simulate many available methods and choose the one that best classified the units of analysis, this study describes how mapping of the ICT adoption in Brazilian companies and conclude that companies with Information Technology (IT) Expenditures are in a moment of ICT adoption relatively superior and possibly improve their competitiveness. The summary of this study motivates investments for the adoption and use of IT. The identification of factors that influence the performance may provide important information for the design of public policies aimed at support of the innovative activities in Brazilian companies.

**Keywords:** Cluster Analysis; Nonparametric Item Response Theory; Information and Communication Technologies.