Autor o Editor
Carlos León

The series Borradores de Economía (Working Papers on Economics) contributes to the dissemination and promotion of the work by researchers from the institution. On multiple occasions, these works have been the result of collaborative work with individuals from other national or international institutions. This series is indexed at Research Papers in Economics (RePEc)

Fecha de publicación
Monday the 2th of December, 2019

Abstract

Anomaly detection methods aim at identifying observations that deviate manifestly from what is expected. Such methods are usually run on low dimensional data, such as time series. However, the increasing importance of high dimensional payments and exposures data for financial oversight requires methods able to detect anomalous networks. To detect an anomalous network, dimensionality reduction allows measuring to what extent its main connective features (i.e. the structure) deviate from those regarded as typical or expected. The key to such measure resides in the ability of dimensionality reduction methods to reconstruct data with an error; this reconstruction error serves as a yardstick for deviation from what is expected. Principal component analysis (PCA) is used as dimensionality reduction method, and a clustering algorithm is used to classify reconstruction errors into normal and anomalous. Based on data from Colombia's large-value payments system and a set of synthetic anomalous networks created by means of intraday payments simulations, results suggest that detecting anomalous payments networks is feasible and promising for financial oversight purposes.