

Detecting structural breaks in panel data models of social interactions with unknown networks*

Michele Aquaro Ryo Okui Wendun Wang
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— Paper available upon request: michele.aquaro@uni.lu —

Abstract

This paper aims to detect structural break points in latent networks in a panel data setting. We consider panel models where the outcome of a unit depends on the outcomes and characteristics of other units. The latent network structure induces high-dimensional parameters and interactive outcomes generate endogeneity. Our goal is to detect breaks in high-dimensional network parameters associated with endogenous variables. We propose a two-step penalized nonlinear least squares approach to estimate the break points based on reduced forms, and show that the resulting estimator achieves superconsistency. This property allows us to estimate, and make inferences on, network and slope parameters as if the true break points were known.

Keyword: Social network; Structural break; Panel data; Nonlinear least squares;
Penalized estimation

*Aquaro: Department of Economics and Management, University of Luxembourg, michele.aquaro@uni.lu; Okui: Faculty of Economics, Graduate School of Economics, University of Tokyo, okuiryo@e.u-tokyo.ac.jp; Wang: Econometric Institute, Erasmus University Rotterdam and Tinbergen Institute, wang@ese.eur.nl. The authors would like to thank Áureo de Paula, Pedro Souza, Liangjun Su and participants at Shanghai Forum 2025, ICBIA2025, IPDC2024, IAAE2023, AMES2023 in Singapore, and at the Universities of Kobe, Pavia, the Luxembourg Institute of Socio-Economic Research (LISER) for valuable comments. We also appreciate Áureo de Paula and Pedro Souza sharing their code. Okui acknowledges financial support from JSPS KAKENHI Grant Nos. 22K20154, 23H00804 and 23K25501. All errors and omissions are our own.