
Sheng-Pin Hsueh
Graduate Institute of International Economics
National Chung Cheng University

Wei-Ming Lee
Department of Economics
National Chung Cheng University

Abstract

In this paper we examine the empirical likelihood (EL) estimation for panel count data models with fixed effects. It is shown that the EL and optimal GMM estimators enjoy the same large sample properties. However, as shown in our Monte Carlo simulation study, the former dominates the latter in terms of finite sample bias. We also examine a bias-corrected EL estimator based on Newey and Smith (2004, *Econometrica*), yet our simulation results show that it may not outperform the EL estimator in finite samples because the bias of the EL estimator is quite small in finite samples. As applications, we consider two empirical studies. The first one examines the relationship between patents and research and development (R&D) expenditures. In contrast with the early findings in Hall, Griliches, and Hausman (1986, *International Economic Review*) and Montalvo (1997, *JBES*), it is found that in addition to the contemporaneous R&D, the second lag of R&D also has a significant effect on patents. Moreover, the total effect of R&D in our empirical study is smaller than that of Montalvo (1997). In the second application, we argue that analysis of the behavior of the number of stock transactions (NST) using linear models may not be reliable and thus apply the fixed-effects panel count data model with EL estimation to examine if market-wide information and firm-specific information affects NST under different market conditions. It is found that while the market condition does play an important role in determining the behavior of NST as in Tai, Chiang and Chou (2006, *Managerial Finance*), the up-market results are different from that of Tai et al. (2006).

**JEL classification:** C23, C25, G12

**Keywords:** empirical likelihood, GMM, number of stock transactions, panel count data, patent and R&D

† Author for correspondence: Wei-Ming Lee, Department of Economics, National Chung Cheng University, Chia-Yi 621, Taiwan; ecdwml@ccu.edu.tw.