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Shrinkage Estimation of Dynamic Panel Data Models with Interactive Fixed Effects *

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Abstract

We consider the problem of determining the number of factors and selecting the proper regressors in linear dynamic panel data models with interactive fixed effects. Based on the preliminary estimates of the slope parameters and factors *a la* Bai and Ng (2009) and Moon and Weidner (2015), we propose a method for simultaneous selection of regressors and factors and estimation through the method of adaptive group Lasso (*least absolute shrinkage and selection operator*). We show that with probability approaching one, our method can correctly select all relevant regressors and factors and shrink the coefficients of irrelevant regressors and redundant factors to zero. Further, we demonstrate that our shrinkage estimators of the nonzero slope parameters exhibit some oracle property. We conduct Monte Carlo simulations to demonstrate the superb finite-sample performance of the proposed method. We apply our method to study the determinants of economic growth and find that in addition to three common unobserved factors selected by our method, government consumption share has negative effects, whereas investment share and lagged economic growth have positive effects on economic growth.

JEL Classification: C13, C23, C51

Key Words: Adaptive Lasso; Dynamic panel; Factor selection; Group Lasso; Interactive fixed effects; Oracle property; Selection consistency

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