A SEMIPARAMETRIC PANEL GRAVITY MODEL OF INTRA-EU TRADE

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ABSTRACT

The common procedure to estimate Gravity equations with panel data is based on the OLS of the transformed log-linear specification including several fixed effects to control for country unobserved heterogeneity. This may lead to a lack of efficiency due to the great number of parameters to be estimated (especially if panels have few time periods) and makes impossible the estimation of the effect of time-invariant variables. On the other hand, the log-linear specification of the gravity equation has found to lead often to inconsistent estimation, as first has been noticed by Santos Silva and Tenreyro (2006). They propose to use instead the Poisson regression with robust variances as a pseudo maximum likelihood estimator. Recently Westerlund and Wilhelmsson (2009) use the Poisson fixed effects estimator for panel data (with robust variances) which accommodates unobserved individual heterogeneity correlated with the explanatories. Based on the recent work of Lombardia and Sperlich(2008) on multilevel regression we introduce a nonparametric component in the gravity panel equation that captures country unobserved heterogeneity dependent on the explanatories without compromising the estimate of the effect of time invariant variables and the estimation of the untransformed nonlinear gravity equation.

JEL Classification: F10; F15; C14; C23.

Keywords: Gravity Model of Trade; Poisson Regression Model; Panel Data; semiparametric estimation.

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