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A note on income converge effects in regional integration agreements

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Abstract

This paper investigates the extent of per-capita income convergence in regional integration initiatives. Panel unit root testing is performed on 28 regional groupings. There is evidence of convergence in South–South integration, but this might be taking place to the bottom.

Keywords: Regional integration; Convergence; Dynamic panels

JEL classification: F15; O40; C12; C23

1. Issues and methodological approach

The wave of regionalism in the 1990s has spurred academic and professional interest towards the economic effects of regional integration agreements (RIAs). A most debated issue is whether or not a RIA stimulates the convergence of per-capita incomes across its participants. The existing empirical literature is not conclusive. Ben David (1993, 1996) documents income convergence in the European Union (EU). However, for other RIAs the evidence is of a substantial lack of convergence or even divergence (i.e. Karras, 1997). In a recent theoretical contribution, Venables (2003) suggests that income dispersion across countries in a RIA will decrease only in the case of North–North integration.[1]

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[1] For a survey of the previous theoretical and empirical work see Schiff and Winters (2003, chapter 5).

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The purpose of this note is to expand the body of existing empirical evidence by testing for intra-regional income convergence in a wide sample of RIAs. Let y_i and y_R indicate (log) real per-capita income in country i and average (log) real per-capita income in the RIA, respectively. The number of countries in the RIA (including i) is N. Let also t represent a generic time. Convergence is defined as a situation where the difference $(y_{it}-y_{Rt})$ evolves into a stationary process. This is indeed a notion of convergence in expectations which has been widely adopted in the literature (see Hall et al., 1997; Montuenga-Gomez, 2002). Operationally, it requires testing for a unit root in the process $(y_{it}-y_{Rt})$.

Time-series unit root testing has been often criticized for its limited power and poor size properties (Haldrup and Jansson, 2006). The small number of observations available on the time-series dimension would then make the country-by-country analysis of income convergence in RIAs of recent formation particularly problematic. However, a panel approach to unit root testing provides a suitable alternative. With this approach, the cross-sectional and time-series information are combined, thus inducing a significant improvement in terms of power of the test.

Following Im et al. (2003), the time-varying difference $(y_{it}-y_{Rt})$ is assumed to be generated by an AR (1) process:

$$(y_{it}-Y_{Rt}) = \phi_i(y_{it-1}-y_{Rt-1}) + X_{it}\delta_i + \varepsilon_{it} \tag{1}$$

and hence, using the notation $z_t \equiv (y_{it}-y_{Rt})$

$$\Delta z_{it} = \beta_i z_{it-1} + X_{it}\delta_i + \varepsilon_{it} \tag{2}$$

where $\beta_i=(1-\alpha_i)$ and $\Delta z_{it}=z_{it}-z_{it-1}$, X are exogenous regressors which may consist of a constant or a constant and a linear trend, δ_i and β_i are parameters to be estimated, and the ε_{it} are white noises. The model can be extended to allow for lagged effects of the dependent variable Δz_i:

$$\Delta z_{it} = \beta_i z_{it-1} + \sum_{j=1}^{J} \Delta z_{it-j} + X_{it}\delta_i + \varepsilon_{it} \tag{3}$$

Given the AR model (3), the null hypothesis of unit roots becomes

$$H_0 : \beta_i = 0 \text{ for all } i \text{ against the alternatives} \tag{4}$$

$$H_1 : \beta_i < 0,\ i = 1, 2...N_1,\ \beta_i = 0, i = N_1 + 1, N_2 + 2....N.$$

Rejection of the null then implies that the stochastic process z_i converges for all i, and hence, that per-capita incomes across member-states in the RIA tend to converge. Two other approaches might be used in testing for convergence within a panel framework of the type just outlined. First, following Levin et al. (2002), one could set $\phi_i=\phi$ in Eq. (2), and hence, $\beta_i=\beta$ in Eqs. (2) and (3). The resulting null hypothesis would be stated as H_0: $\beta=0$ against the alternative H_1: $\beta<0$. This formulation is, however, less general than (4). In fact, (4) allows for β_i to differ across countries. It also allows for some (but not all) countries not to converge under the alternative hypothesis. Because of the cross-country heterogeneity that often characterizes the membership of RIAs, formulation (4) appears more appropriate. The second alternative