Income Convergence in Regional Agreements

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Abstract

This study examines the extent of income convergence trends in regional agreements all over the world. Traditional economic theory holds that poor countries, with low ratios of capital to labor, have high marginal products of capital and thereby tend to grow at high rates. However, this paper focuses on another aspect of growth: regional agreements. Income convergence is related to regional agreements, especially in the case of South-South countries. It may be that trade liberalization has an impact on incomes and brings about a sort of convergence.

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1. Introduction

World trade has increased greatly since the world worlds. The GATT, WTO, and IMF have contributed to this trend. Tariffs, import quotas, and export subsidies have been reduced or abolished. On the other hand, a new trend toward regionalization has appeared. The regionalism movement of the 1980s spurred interest in the economic effects of regionalization.

This study examines the extent of income convergence in regional agreements. Much research has been presented regarding this issue; however, little study has been assessed whether or not regional integration stimulates the convergence of income across its countries. In the EU,

convergence of income has been occurring; however, Carmignani (1996), Karras (1997) and Venables (2003) showed a substantial lack of convergence in other areas. They found that changes in disparity of income are not related to a simple trend. In neoclassical growth models, the growth rate of per capita income tends to be inversely related to its starting level. Poor countries, with low ratios of capital per capita to labor, have high marginal products of capital and thereby tend to grow at high rates. The tendency for low income countries to grow at high rates is reinforced in extensions of this neoclassical model that account for international mobility of capital and technology. If countries are similar with respect to structural parameters for preferences and technology, poor countries tend to grow faster than rich countries. Thus, there is a force that promotes convergence in levels of per capita income among countries. There have been several attempts at promoting free trade on a regional basis. There may be relationship between this movement and income convergence (Ben, 1993, 1996). The purpose of this short paper is to examine regional income convergence all over the world.

2. Empirical Method

Let yi and $y_{average}$ indicate the log of real per capita income in country i and the average log of real per capita income in the area. t presents a generic time.

First, it is necessary to check a time-series unit root in the process $(y_{it} - y_{averaget})$. However, time-series unit root tests have been criticized for limited power and poor size properties (Haldrup and Jansson, 2006). A panel analysis to unit root test provides another suitable method. In this paper, the cross-sectional and time-series information are combined, thus inducing a significant improvement in the empirical analysis (following Im et al., 2003).

The time-varying difference $(y_i - y_{average})$ is assumed to be generated by an AR (1) process.

$$(y_{it} - y_{averaget}) = \phi_i(y_{it-1} - y_{averaget-1}) + X_{it}\delta_i + \varepsilon_{it} \quad (1)$$

Using the notation $Y_t \equiv (y_{it} - y_{averaget})$,

$$\Delta Y_{it} = -\alpha_i Y_{it-1} + X_{it}\delta_i + \varepsilon_{it} \quad (2)$$

Where $\alpha_i = (1-\phi_i)$ and $\Delta Y_{it} = Y_{it} - Y_{it-1}$, X are exogenous regressors that consist of a constant and a linear trend, and δ_i and α_i are parameters to be estimated, and ε_{it} is assumed to be white noise. The model can be extended to allow for lagged effects of the dependent variable ΔYi:

$$\Delta Y_{it} = -\alpha_i Y_{it-1} + \sum_{j=1}^{J} \Delta Y_{it-j} + X_{it}\delta_i + \varepsilon_{it} \quad (3)$$

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

$$\alpha_i = 0 \text{ or,}$$
$$\alpha_i > 0,\ i = 1, 2, \ldots..N \quad (4)$$

N is the number of countries. Rejection of the null means that the stochastic process Y_i converges for all i, indicating that per capita incomes across countries tend to converge.

One important problem remains in performing the convergence test, which is the decision of how many lags of ΔY_i should be added to (3) and what variables the set of regressors should be included in X. The lag structure is chosen to minimize the Schwartz Information Criterion. It is defined as $-2(l/T) + k\log(T)/T$ (l: the value of the log of the likelihood function using the k estimated parameters; k: the number of parameters;

T: observations). To estimate the equation, the countries of each group are pooled together.

The GDP data for the test are in constant prices and adjusted for PPP. The sample period is basically divided into two: after the regional agreement and before. The data are from International Financial Statistics (IMF). Rejection of the null can be interpreted as evidence that income per capita converges across countries in a regional integration agreement as mentioned before.

3. Results of empirical study

The results are shown in the Table.

Table. *Regional Integration Agreement*

Regional Integration Agreement	Sample Period	t value	Standard error of deviation
ASEAN (Indonesia, Malaysia, Philippines, Singapore, Thailand)	1967-2005	1.805	3.726
CACM (El Salvador, Guatemala, Honduras, Nicaragua (1991～), Costa Rica)	1967-2005	−1.528***	4.550
CARICOM (Antigua and Barbuda, Bahama, Barbados, Belize, Dominica (1974～), Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent Suriname, Montserrat (1977～), Trinidad and Tobago)	1973-2005	−1.880***	3.686
CIS (Armenia (1994～), Azerbaijan (1996～), Belarus, Georgia, Kyrgyz Republic, Kazakhstan, Moldova, Russia, Turkmenistan, Ukraine)	1993-2005	−0.663	2.199
ECOWAS (Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea-Bissau (1987～), Liberia, Mali, Niger, Nigeria,	1975-2005	−2.505***	4.392

Senegal, Sierra Leone, Togo)			
SADC (Angola, Botswana, Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia (1986～), Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe)	1992-2005	−0.640*	2.034
APEC (Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taiwan, Thailand, US, Vietnam)	1989-2005	−0.225	1.936
EU 15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, UK)	1995-2005	1.982	8.927
NAFTA (Canada, Mexico, US)	1994-2005	−1.634**	3.293

Note. ***, **, and * denote rejection of the null hypothesis at 1%, 5%, and 10% respectively. Ten countries joined in the EU; however, because little sample data were available, the former EU was employed.

The results are interesting. Convergence of per capita income is not necessarily a characteristic of North-North integration. The null hypothesis is rejected for some developing countries. These developing or emerging economies can be characterized as cases of South-South integration. The convergence may be related to the formation of the regional integration agreement, especially with regard to trade liberalization.

On the other hand, ASEAN and CIS, for example, do not converge to the regional mean. In these countries, average income is catching up those in industrial economies. The North-North integration (e.g., EU) does not appear to generate convergence.

4. Conclusion

This paper examined the hypotheses that regional agreement may

contribute to income convergence. Income differentials fall when countries begin to remove trade barriers among themselves. One of the important conclusions is that South-South integration does not necessarily imply widening intraregional disparities. The main element behind this convergence is diminishing returns to reproducible capital. Poor countries, with low ratios of capital to labor, have high marginal products of capital and thereby tend to grow at high rates. On the other hand, ASEAN and CIS, for example, fail to converge. This finding may reflect the fact that their incomes are catching up to those of other industrialized countries. Developed countries also do not exhibit convergence. However, these agreements might lead to a form of convergence to the bottom.

This study brings to light some possibilities for further research. For example, a country should consider which countries should be selected for their economic growth. Choosing an appropriate country or countries with which to engage in regional agreements is important for their economic growth. It would be of interesting future research.

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Notes

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