

Economic Integration and Convergence: Lessons from Asia, Europe and Latin America

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Abstract

This paper examines whether economic integration facilitates convergence in per capita income by investigating the post-war convergence experience within three regional economic areas: the Association of Southeast Asian Nations (ASEAN), the European Union (EU), and the Latin American Free Trade Area (LAFTA). A number of different empirical tests and specifications provide evidence that convergence in income per capita has been the strongest and most rapid in the EU, milder but probably present in LAFTA, and nonexistent in ASEAN. (JEL Classification: F15, O41)

I. Introduction

In an increasing number of areas in the world, strengthening and expansion of regional economic integration appears to be unstoppable. Since the late 1980s, a number of factors including the collapse of most centrally-

Union), but also to create new ones (such as NAFTA).¹ As this trend is currently expected to continue, a critical question is whether economic integration, in its various forms, will facilitate convergence in the standard of living among member countries.

This paper addresses the issue by examining the post-war convergence experience of three regional economic areas: the Association of Southeast Asian Nations (ASEAN), the European Union (EU), and the Latin American Free Trade Area (LAFTA). As these three groups exhibit significant diversity within and (particularly) among them, their experience is also valuable for various other regional blocs that are now emerging or consider expansion. Despite the subject's importance, however, very few empirical studies of it exist. A recent exception is Ben-David [1993] who found that the economic integration and internal trade liberalization promoted by the European Economic Community contributed substantially to the income convergence of its members. By expanding the scope of the analysis to include regional areas that span three continents, the present paper will examine whether this positive relationship between integration and convergence can be reasonably expected to be universal.

Table 1 gives a list of the countries that comprise each of the three economic areas, together with basic income statistics by country.² The origins of ASEAN, which consists of five Asian economies, go back to the early 1960s, but the bloc formally exists since 1967, as a result of the Bangkok declaration. The EU, which currently consists of fifteen European countries, has grown out of the European Economic Community, formed by the Treaty of Rome in 1957. LAFTA, which consists of seven Latin American countries, was created by the 1960 Treaty of Montevideo, and is also known as LAIA (Latin America Integration Association) since 1980.

Table 1
Summary Statistics

	GDP per Capita		Annual Growth Rate
	1960	1990	1960-1990
ASEAN			
1. Indonesia	638	1,974	2.86%
2. Malaysia	1,420	5,124	3.26%
3. Philippines	1,133	1,763	1.11%
4. Singapore	1,658	11,710	5.00%
5. Thailand	943	3,580	3.39%
EU			
1. Austria	2,930	12,695	3.73%
2. Belgium	4,433	13,232	2.77%
3. Denmark	5,263	13,909	2.45%
4. Finland	3,506	14,059	3.53%
5. France	4,045	13,904	3.13%
6. Germany	3,421	14,341	3.64%
7. Greece	1,409	6,768	4.00%
8. Ireland	2,730	9,274	3.10%
9. Italy	2,743	12,488	3.86%
10. Luxembourg	6,534	16,280	2.30%
11. Netherlands	4,532	13,029	2.67%
12. Portugal	1,208	7,478	4.66%
13. Spain	1,913	9,583	4.11%
14. Sweden	5,807	14,762	2.35%
15. U.K.	5,395	13,217	2.26%
LAFTA			
1. Mexico	2,198	5,827	2.46%
2. Argentina	4,032	4,706	0.38%
3. Brazil	1,265	4,042	2.94%

Notes: GDP per Capita is in constant US dollars, 1985 (PPP) prices; Annual Growth Rate is the average annual growth rate of GDP per Capita over the period indicated. ASEAN: Association of Southeast Asian Nations; EU: European Union; LAFTA: Latin American Free Trade Area.

Examining the first two columns of Table 1, the diversity of these countries in terms of income per capita becomes immediately apparent, both between and within blocs. In 1990, output per capita in ASEAN's richest member (Singapore) was more than 6.5 times greater than in the poorest (the Philippines); in EU's richest member (Luxembourg) it was almost 2.5 times greater than in the poorest (Greece); and in LAFTA's richest member (Mexico) more than 2.5 times greater than in the poorest (Paraguay). But this does not mean that integration has not promoted convergence. Indeed, in EU and LAFTA the richest/poorest income ratios were considerably higher in the past: in 1950 the EU Luxembourg/Portugal ratio was almost 5.5, and the LAFTA Argentina/Paraguay ratio was more than 3. On the other hand, the ASEAN Singapore/Indonesia ratio in 1960 was about 2.5. Looking at the average annual growth rates in the last column of Table 1, a similar cross-country variability is demonstrated. Do these developments of the last three or four decades constitute evidence in favor of convergence? Is there reason to believe that, given time, income per capita tends to equalize across integrated regions? This is the nature of the questions addressed in this paper.

The remainder of the paper is organized as follows. Section II outlines a standard theoretical framework based on some of the properties of the neo-classical growth theory. Section III focuses on the conventional convergence test, and section IV conducts two more recently proposed alternatives. Both the traditional and the more recent econometric tests support the same answer: convergence has been the strongest in the EU, milder but probably present in LAFTA, and nonexistent in ASEAN. Section V discusses and concludes.

II. Theoretical Framework and Data

where c is per-capita consumption, ρ the rate of time preference, t indexes time, and the utility function satisfies $u'(c) > 0$ and $u''(c) < 0$. The production technology is given by

$$Y_{it} = F(K_{it}, A_{it}N_{it}) \quad (2)$$

where Y is output, K capital, N labor (growing at the rate $n_i = \dot{N}_{it}/N_{it}$), A the level of technology (assumed to be labor augmenting for the steady state to be well defined), and F a neoclassical production function.³ It is easily shown that if, for all i , $\rho_i = \rho$, $A_{it} = A_t$, and $n_i = n$, all economies will converge to the same steady state income per capita regardless of their initial levels. In this case there is **absolute** convergence across the economies: poor countries must grow faster than richer countries. If, on the other hand, the ρ_i s, A_i s, or n_i s differ, the steady states will differ as well, but there would still be **conditional** convergence: the further from the steady state an economy is, the higher its rate of growth; or alternatively, controlling for the different steady-state determinants, growth will again vary inversely with the initial level of income.⁴

All data are from the Penn World Table, Mark 5.6, documented in Summers and Heston [1991] and updated in 1995. The series are per capita and measured in terms of an international basket of goods. Throughout the paper, the analysis period will be 1960-1990 for ASEAN, and 1950-1990 for EU and LAFTA. These choices were dictated by data availability only.

III. A Conventional Test for Convergence

Has there been convergence in income within the three groups of countries analyzed in this paper? Beginning with the conventional test for convergence, Figures 1, 2, and 3, examine the cross-sectional relationship between

³ A neoclassical F has positive and diminishing marginal products, and exhibits con-

Figure 1
Average Growth vs 1950 GDP per Capita in ASEAN

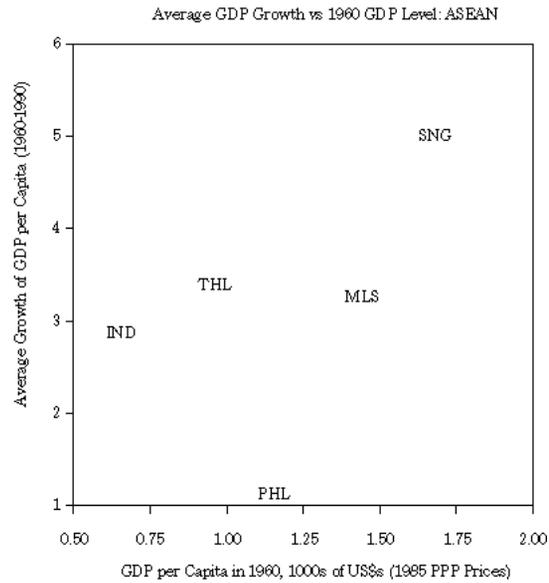


Figure 2
Average Growth vs 1950 GDP per Capita in EU

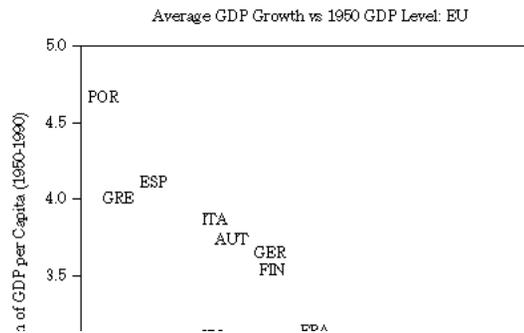
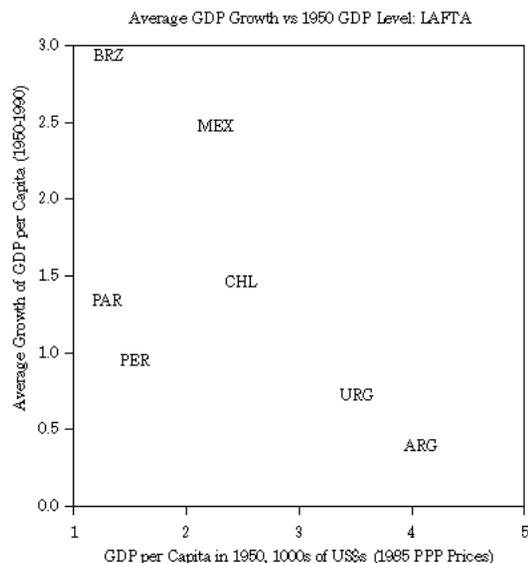


Figure 3
Average Growth vs 1950 GDP per Capita in LAFTA



the average real growth rate and beginning-of-period GDP per capita within ASEAN, EU, and LAFTA, respectively. The Figures reveal a very interesting contrast among the three regions.

On the one hand, Figure 1 demonstrates a clear and strong positive relationship between real growth over the 1960-1990 period and the 1960 GDP per capita in ASEAN (correlation coefficient = 0.50; significance level = 0.08). Therefore, countries with high income levels in 1960 (such as Singapore and Malaysia) have grown much faster than the low-income countries of 1960 (Indonesia and the Philippines), indicating a further distancing of the rich from the poor. This is not only inconsistent with convergence – it actually points to divergence among the ASEAN countries.

(Luxembourg, Sweden, and the U.K. in EU, and Argentina and Uruguay in LAFTA), indicating a catching up of the poor with the rich. Moreover, as no other factors are controlled for in this bivariate relationship, the highly statistically significant negative correlations are consistent with absolute convergence in EU and LAFTA.⁵

IV. Two Additional Convergence Tests

The conventional test is straightforward and suggestive but, as Friedman [1992], Quah [1993a, 1993b], Durlauf and Johnson [1992], and Evans and Karras [1996] have shown, it is flawed and potentially misleading. Therefore, it is supplemented here by two alternatives.

The first alternative test relies on the dispersion of real GDP per capita across countries. For a sample of N economies, consider the following measure of cross-country variance:

$$\hat{\sigma}_t^2 = (1/N) \sum_{i=1}^N (y_{it} - \bar{y}_t)^2, \quad (3)$$

where y_{it} denotes the logarithm of real GDP per capita in country i at time t , and $\bar{y}_t = \frac{1}{N} \sum_{i=1}^N y_{it}$. The three panels of Figure 4 plot $\hat{\sigma}_t^2$ for ASEAN, EU, and LAFTA. Once more, the contrast between ASEAN and the other two blocs is evident.

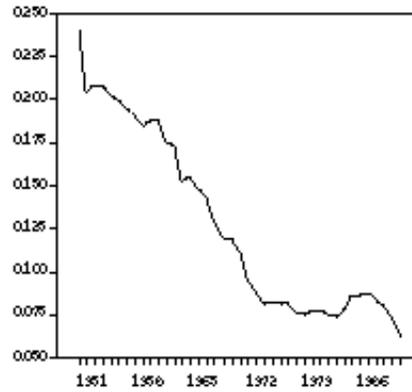
For ASEAN, the cross-country variance has increased from 0.11 in 1960 to 0.47 in 1990, indicating an increase in dispersion of income per capita across the five members by a factor of four. In addition, the increase has been almost monotonic and often steep, with the exception of the 1973-1983 period when it slowed down somewhat and was almost, but not quite, arrested. This is of course consistent with our earlier evidence of divergence across the five economies.

Figure 4
Cross-Country Variances by Year

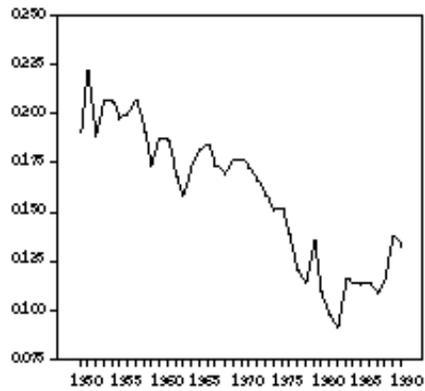
ASEAN (1960-1990)



EU (1950-1990)



LAFTA (1950-1990)



identical. First, the reduction has been substantially more pronounced in EU, where dispersion was reduced by 75%, than in LAFTA, where it declined by about 30%. Second, the decline has been remarkably smooth in EU, but quite volatile in LAFTA.

The second alternative test for convergence, which fully utilizes both the cross-section and time dimensions of the data, relies on the following set of equations, estimated as seemingly unrelated regressions for each group of countries:

$$(y_{it} - \bar{y}_t) = \alpha_i + \beta_i(y_{it-1} - \bar{y}_{t-1}) + \sum_{j=1}^J \phi_{ij} (y_{it-j} - \bar{y}_{t-j}) + u_{it}, \quad (4)$$

where Δ is the difference operator; the α_i s, β_i s, and ϕ_{ij} s are parameters such that the roots of the polynomial $1 - \sum_{j=1}^J \phi_{ij} L^j$ lie outside the unit circle; and u_{it} is a serially uncorrelated error term. The system of equations described in (4) implies that $y_{it} - \bar{y}_t$ will be stationary if $\beta_i < 0$, but nonstationary if $\beta_i = 0$. It follows that the twenty countries may converge only if we can reject the null hypothesis $H_0: \beta_i = 0$, for all i .⁷ This can be tested using the Wald-type statistic $\hat{W} = \hat{\beta}' \hat{\Sigma}_{\beta}^{-1} \hat{\beta}$, where $\hat{\beta}$ is the vector of estimated β_i s and $\hat{\Sigma}_{\beta}$ is the estimated variance-covariance matrix of $\hat{\beta}$. Because \hat{W} has non-standard distribution under the null, critical values and significance levels are obtained by Monte Carlo simulations of 10000 draws calibrated to the present sample. The results for EU and LAFTA, and for a number of different lag specifications, are as follows:⁸

	J = 0	J = 1	J = 2	J = 3
\hat{W} (EU)	134.21**	90.74**	77.10*	83.93*
\hat{W} (LAFTA)	11.35	17.75	11.85	14.97

where '**' and '*' indicate statistical significance at 1% and 5% respectively

for EU but not for LAFTA. This buttresses our earlier evidence in favor of convergence in EU, but weakens it for LAFTA.

V. Concluding Comments and Discussion

This paper examined whether economic integration facilitates convergence in per capita income by investigating the convergence experience within three regional economic areas: the Association of Southeast Asian Nations (ASEAN), the European Union (EU), and the Latin American Free Trade Area (LAFTA).

A number of different empirical tests and specifications provided evidence that convergence in income per capita has been the strongest and most rapid in the EU, milder but probably present in LAFTA, and nonexistent in ASEAN. The findings, in fact, are not inconsistent with divergence within ASEAN. The immediate conclusion to be drawn from these results is that the formation or expansion of economic blocs, far from assuring homogenization among the country-members, does not even guarantee a gradual convergence in their standards of living.

But at least equally important is the finding that economic areas can differ widely in their convergence experiences. The examination of the reasons why some blocs are better income equalizers than others is a promising avenue of future research. What are the features of EU that have so successfully allowed its low-income members to catch up to the richer economies? Why has this process been weaker in LAFTA, and completely lacking in ASEAN? The EU-LAFTA-ASEAN ranking offers us some hints. One possibility is that the crucial variable is the degree of integration as manifested in the reduction of protection and enhancement of internal trade. Another candidate is the extent of economic policy coordination

References

- Balasubramanyan, V.N. [1987], "ASEAN and Regional Trade Cooperation in Southeast Asia," in D. Greenway, T.Hyclak, and R.J.Thornton (eds.) *Economic Aspects of Regional Trade Agreements*, New York University Press.
- Barro, Robert J. and Xavier Sala-i-Martin [1991], "Convergence Across States and Regions," *Brookings Papers on Economic Activity* 1; pp. 107-182.
- Barro, Robert J. and Xavier Sala-i-Martin [1995], *Economic Growth*, McGraw-Hill.
- Baumol, William J. [1986], "Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show," *American Economic Review* 76; pp. 1072-1085.
- Bean, Charles R. [1992], "Economic and Monetary Union in Europe," *Journal of Economic Perspectives* 6; pp. 31-52.
- Ben-David, Dan [1993], "Equalizing Exchange: Trade Liberalization and Income Convergence," *Quarterly Journal of Economics* 108; pp. 653-679.
- Bernard, Andrew B. and Steven N. Durlauf [1991], "Convergence of International Output Movements," *NBER Working Paper* No. 3717, May.
- Cass, David [1965], "Optimum Growth in an Aggregative Model of Capital Accumulation," *Review of Economic Studies* 32; pp. 233-240.
- Edwards, Sebastian and Miguel Savastano [1987], "Latin America's Intra-Regional Trade: Evolution and Future Prospects," in D.Greenway, T.Hyclak, and R.J.Thornton (eds.) *Economic Aspects of Regional Trade Agreements*, New York University Press.

- tion," Working Paper.
- Friedman, Milton [1992], "Do Old Fallacies Ever Die?" *Journal of Economic Literature* 30; pp. 2129-2032.
- Hitiris, T. [1991], *European Community Economics*, 2nd edition, St. Martin's Press, New York.
- Krugman, Paul [1991], "Is Bilateralism Bad?" in E.Helpman and A.Razin (eds.) *International Trade and Trade Policy*, MIT Press, Cambridge,
- Krugman, Paul [1993], "Regionalism versus Multilateralism: Analytical Notes," in J.De Melo and A.Panagariya (eds.), *New Dimensions in Regional Integration*, Cambridge University Press.
- Lucas, Robert E., Jr. [1988], "On the Mechanics of Economic Development," *Journal of Monetary Economics* 22; pp. 3-42.
- Mankiw, N.Gregory, David Romer, and David N. Weil [1992], "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics* 107; pp. 407-438.
- Nogués, Julio J. and R. Quintanilla [1983], "Latin America's Integration and the Multilateral Trade System," in J.De Melo and A.Panagariya (eds.) *New Dimensions in Regional Integration*, Cambridge University Press.
- Quah, Danny [1993a], "Empirical Cross-Section Dynamics in Economic Growth," *European Economic Review* 37; pp. 427-434.
- Quah, Danny [1993b], "Galton's Fallacy and Tests of the Convergence Hypothesis," *Scandinavian Journal of Economics* 95; pp. 427-443.
- Ramsey, Frank P. [1928], "A Mathematical Theory of Saving," *Economic Journal* 38; pp. 543-559.
- Rebelo, Sergio [1991], "Long-Run Policy Analysis and Long-Run Growth," *Journal of Political Economy* 99; pp. 500-521.
- Robson, Peter [1987], *The Economics of International Integration*, Allen & Unwin (3rd edition), London.

Summers, Robert, Alan Heston [1991], "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988," *Quarterly Journal of Economics* 106; pp. 327-368.

Winters, L. Alan [1993], "The European Community: A Case of Successful Integration?" in J.De Melo and A.Panagariya (eds.), *New Dimensions in Regional Integration*, Cambridge University Press.