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# Income convergence within the MENA countries: A panel unit root approach

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**Abstract**

This article aims at testing the convergence hypothesis in MENA region using new tests of a unit root in panel data. Evans and Karras [Evans P., & Karras G. (1996). Convergence revisited. *Journal of Monetary Economics*, *37*, 249–265] and Bernard and Jones [Bernard A., & Jones C. I. (1996). Productivity across industries and countries: Time series theory and evidence. *The Review of Economics and Statistics*, 135–146] recommend this technique to evaluate the income convergence hypothesis. According to them it avoids econometric problems of the cross-countries growth regressions testing convergence and sample bias of the multivariate cointegration techniques. We test for both absolute and the conditional convergence with panel unit root tests using the Summers and Heston's data 5.6 and 6.1 on the periods of 1960 to 1990 and from 1960 to 2000. The absolute convergence hypothesis use panel unit roots test with no fixed individual effects. The catching-up hypothesis is not rejected for most groups of countries of the region during both periods. If we allow a break in the unit root tests, the hypothesis is not rejected for more groups. The conditional convergence requires panel unit root tests with fixed individual effects. Again, during the whole periods, the conditional convergence is not rejected for the major part of the remaining groups of MENA countries.


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## 1. Introduction

In the convergence debate, two definitions have emerged: the absolute convergence and the conditional convergence. The former occurs when the level of per capita income of the poor countries catch-up with the one of the rich ones. This can be achieved if the growth rates of developing countries are significantly higher than those of developed countries. The latter implies that each country is converging to its own steady state and that in the long run all the growth rates will be equalized.

Since the pioneer work of Baumol (1986) and Barro and Sala-i-Martin (1991), the test of the convergence hypothesis has consisted of fitting cross-country regressions relating the average growth rate of per capita income over a fixed period of time to the initial per capital income and catch country's characteristics. Convergence is said to occur if a negative correlation is found between the average growth rate and the initial income.

Quah (1993) criticizes cross-country growth regression on the basis of Galton's fallacy and shows that in order to evaluate the convergence hypothesis one must exploit the time series properties of the cross-country variances. Furthermore, Bernard and Durlauf (1996) demonstrate that the cross section growth regressions cannot discriminate between the hypotheses of global or local convergence. Finally, Evans (1996) proves that the classical approach is indeed valid under highly restrictive conditions never satisfied by the available data.[1] So, he suggests exploiting both the time series and the cross section information included in the data of the per capita income in order to evaluate the convergence hypothesis.

Two main approaches have been developed. Firstly, cross-country growth regressions have been extended to take into account panel data estimations (Islam, 1995). Secondly, using a time series definition of convergence Bernard and Durlauf (1995), Evans and Karras (1996), Bernard and Jones (1996), and Evans (1998) developed formal panel unit root tests to evaluate the income convergence hypothesis. This article uses these new unit root tests to examine the convergence hypothesis in some Middle East and North Africa (MENA) region groups of countries. We will consider both the absolute and conditional convergence with panel unit root tests. The absolute convergence hypothesis uses a panel unit roots test with no fixed individual effects, whereas the conditional convergence requires panel unit root tests with fixed individual effects.

The MENA region is rich in natural and human resources, labor, GDP, and population. Its countries vary, in some cases considerably, in economic size, population, the balance between the public and private sectors, and financial and natural resources. Several countries in the region have made significant progress in adjustment and reform, and are qualified to be catching-up with developed countries. However, to our knowledge, there is no formal proof of such a result. This paper aims to apply new techniques using a panel data approach to test a convergence hypothesis in the region for 20 groups of countries during the period 1960–1990 and for 17 groups from 1960 to 2000.[2]

The catching-up hypothesis is not rejected for 15 groups during the period of 1960–1990. The absolute convergence hypothesis is not rejected during the second period 1960–2000 for only 12 groups. Conditional convergence is not rejected, during the whole period 1960–1990 for 2 of the

[1] The following conditions are necessary and sufficient for valid inference: the dynamical structures of the economies must have the same first-order autoregressive representation; economies affect each other completely symmetrically; and the vector of explanatory variables control for all permanent cross-economy differences.

[2] See Serranito (1997) for an application with Asian countries, and Gaulier, Hurlin and Jean-Pierre (1999) for European and OECD countries.