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Full Length Research Paper

Economic growth convergence among Middle East Countries

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The main result of early neoclassical growth models supports the convergence of economic growth among countries. Given that countries converge to their steady state growth path, countries with lower economic growth will move faster than rich ones based on the neoclassical growth models. A tremendous amount of research studies have investigated the growth convergence among different regions and countries. Among others, Barro and Martin (1990) use a neo-classical growth model to find clear evidence of convergence among US states. However, many believe that since the infusion of knowledge appears with a time lag, it may take more than a century for countries to converge to the same economic growth path in a steady state. In this study, we used fixed effect models to test the hypothesis of convergence among Middle East Countries for the period of 1995-2005. We tested for both absolute and conditional convergence using both GDP and per capita income. We also divided countries into two sub-groups, oil producing countries and non-oil producers, to see whether convergence exists within both group and whether the speed of convergence is different. Our results suggest that though there is a tendency of convergence among Middle East countries, the speed of convergence is different for oil producers compared with non-oil producers.

Key words: Neo-classical growth model, steady state growth path, fixed effects model, absolute convergence, conditional convergence.

INTRODUCTION

The endogenous growth models embrace a diverse body of theoretical and empirical studies that distinguish itself from neoclassical growth models by emphasizing that economic growth is an endogenous outcome, not the result of forces that impinge from outside**.**

The question which has attracted so much attention in recent studies is whether per capita income and economic growth in different countries or among different regions are converging or not. Though many have found evidence of convergence, others have been unable to do so. As a matter of fact, the convergence of economic growth among countries depends on the structure of the economies and the type of the shocks that threaten the countries.

Though the literature has already examined the convergence of economic growth among many regions, particularly in Europe and within the US, less attention has been paid to Asia, especially to Middle East. Since the countries in the latter region differ from the view point of oil resources, some are oil based while others are not, it is very important to see whether these countries converge to a steady state economic growth. If they do, that means oil revenue does not matter in achieving higher economic growth. Finally, these countries will achieve convergence and the per capita income gap will disappear among them. Though many of these countries have not generally experienced high economic growth, some of them are quite different from others due to different legal framework including; property rights, rule of law, indebtedness, degree of openness, corruption, adverse demographic trends, education and health system.

To see whether the convergence phenomenon exists among these countries, we tried to test the hypothesis of whether economic growth converges within the region or not. We divided the countries into oil based and non-oil

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based countries to see whether there is a difference in convergence between the whole sample and those that are oil based. Our empirical analysis is based on a pooled data set for 13 developing countries in the region over the period of 1995 to 2005. The results will have important policy implications for these countries because it will predict whether countries that are on a lower steady state growth path, taken into account differences in their fundamentals such as openness, education system, inflation, and legal framework, will achieve higher growth of other countries in the region or not.

Literature review

In their analysis, Maddison and William Baumol (1986) found that poorer countries grow faster than richer countries and as a result the per capita income gap will disappear. However in Maddison, data set convergence takes place since World War II, and between 1870 and 1950 per capita income tended to diverge. Second, the Maddison sample included countries that have successfully industrialized by the end of the sample period, which is called sample-selection bias by Delong (1988). The neoclassical model that was first developed by Solow (1956, 1967) was the first step in constructing a formal growth model. The discussion on convergence controversy in terms of neoclassical model illustrates the model's power and durability.

Even though it is obvious that endogenous growth theory would have to introduce imperfect competition, this was not the direction that the first models of the 1980s pursued. Both Romer's (1986) and Lucas's (1988) model highlighted the fact that technology change is an endogenous initiative.

The new endogenous growth models explain the sources of technologically driven productivity growth. In these models, the accumulation of knowledge plays a key role in driving productivity growth. The study of Grossman and Helpman (1994) focus on diffusion of technology. In more recent studies, an effort is made to analyze how technological progress is transferred across countries. One important implication of the new studies is that if there is significant agglomeration effects associated with R&D activity, the benefits of R&D are largely captured by the region in which R&D takes place.

Finally in the endogenous growth models, the long-run growth rate can depend on government policies, whereas in the basic neoclassical growth model, government does not have an impact on the long run growth rate. In an endogenous growth framework, government policies have important implications on the long-run steady-state growth rate; since government policies such as taxation, intellectual property rights, rule of law, good governance, democracy, educational system, indebtedness, and degree of openness can affect the long-run growth rate, governments may promote the regional economic growth or adversely affect it depending on the direction of policies that are taken.

However, empirical studies show that, while the convergence occurred within different states in the United States and among the DCs (Barro and Sala-I-Martin 1992; Baumol, 1986), most LDCs failed to narrow the gap in per capita income with the DCs (Pearson et al., 1969; Romer, 1994). In the recent past, there has been divergence with the US growing faster than the OECD average. Within the group of OECD countries, the picture is similar. The poorer countries tended to grow faster than more advanced ones until the 1970s, but subsequent catch up has been slow.

Meanwhile, there have been significant differences in the growth performance of developing countries since 1970, with growth in Asia notably higher than elsewhere. These differences were especially marked during the 1980s, when per capita income increased at an average annual rate of nearly 5 percent in Asia but declined in other regions. There has also been significant variation within the Asia. While growth in China, Malaysia, and Thailand was spectacular during the 1990s it was relatively low in most Middle East countries. Indeed, countries have differed in the degree of persistence of above- and below-average growth over time due to changes in government policies, and the external environment. Although the East Asian countries have sustained very strong performances, growth has been more unstable in the developing countries, where many countries have been affected by large changes in terms of trade, hyperinflation, civil conflicts, war, and terrorism.

As a matter of fact, many empirical studies reject the income convergence hypothesis among the developing countries. To explain the income inequality, a growing literature has focused on the interaction between fundamentals and the process of economic growth. Many believe that income inequality among the developing countries reflects cross-section heterogeneity, in the sense that countries are different in terms of natural resources, property rights, good governance, rule of law, democracy, openness, indebtedness, and infrastructures. These inequalities can induce divergence, rather than convergence, if these factors impede the transfer of technology.

Empirical studies suggest that there is little evidence of catching up in living standards between developing and industrial countries as well. Catching up as suggested in the Solow model might have been expected for two main reasons. First, higher potential returns to capital in the low-income countries due to scarcity of capital would attract capital flows, leading to an increase in capital accumulation and growth in developing countries. Second, because of the low-income countries' techno-logical gap compared with the more affluent countries, productivity might have been expected to grow faster in developing countries. The fact that many developing countries have not caught up with industrialized countries

suggests that the capital return in many developing countries is not that much higher than developed world. Moreover, capital flow is more affected by security and government policies, rather than rate of return. Even countries with higher rates of return to capital may not be able to attract international capital flow due to political and economic risk and unsecure environment. Moreover, there is no evidence that developing countries have experienced higher productivity growth.

More importantly, external shocks such as, terms of trade, world interest rates, foreign direct investment (FDI), and sanctions, can contribute to divergence of growth among developing countries. However in many cases, the effects of these factors on the long-run growth performance have been limited compared with the role of domestic policies.

DATA AND METHODOLOGY

Convergence studies were used to estimate Ordinary Least Squares (OLS) estimation in cross section analyses (Barro and Sala-i-Martin, 1991; Levineand, 1992; de la Fuenta, 1996; Fagerberg and Verspagen, 1996; Tondl, 1999). However, many critics have argued that OLS estimation leads to biased results in which regressors are correlated with the error term. In response to these criticisms, Islam (1995) used Fixed Effect Model (FEM) or Least Square Dummy Variables (LSDV) to set up the analyses within a panel framework in order to control the individual specific effects such as country characteristics, which are time invariant. However, the convergence rates using this method are found to be extremely high—up to 20% (de la Fuenta, 1996; Tondl, 1999). Our empirical analysis is based on pooled data set for 13 developing countries mainly from Penn World database over the period of 1995 to 2005. The powerful method in pooled cross country time series namely the Pooled Mean-Group Estimator (PMGE) proposed by Pesaran, Shin and Smith (1999) is used to explain cross-country differences in growth rates as well as income per capita in the long-run. PMGE allows for heterogeneity in short-term coefficients but restricts the long-run coefficients to be the same for all countries (Pesaran et al., 1999). In PMGE, the long run coefficient will be identical for all countries; however, the intercept, the speed of convergence and the short-run coefficient (*b*'s) will differ. We used the Hausman (1978) test to test the null hypothesis of homogeneity in the long-run parameters.

Our sample includes the following countries; Azerbaijan, Bahrain, Egypt, Iran, Jordan, Kuwait, Libya, Oman, Pakistan, Saudi Arabia, Syria, Turkey, and Yemen. We divided our sample to two sub-groups, oil producing and non-oil producing countries to see whether there is a difference between convergence of two groups. We tested for both absolute and conditional convergence for the entire sample as well as for sub samples.

ESTIMATED RESULTS

Absolute convergence

To test for the absolute convergence we used both real GDP growth and per capita income. The models we use are follows:

Models (1) and (2) are the following:

$$LY_{i,t} - LY_{i,t-1} = \alpha_0 + \alpha_1 LY_{i,t-1} + \xi_t \quad (1)$$

$$Ly_{i,t} - Ly_{i,t-1} = \alpha_0 + \alpha_1 Ly_{i,t-1} + \xi_t \quad (2)$$

Whereas Y reflects GDP growth rate and y represents income per capita.

Using fixed effect model for the entire sample based on Hausman, results for the GDP growth and per capita income convergence are summarized in Tables 1 and 2, respectively.

According to our result, the null hypothesis of convergence is approved in both cases for GDP growth and per capital income the entire sample is rejected, whereas it is approved when we used income per capita.

We divided our sample into oil producing and non-oil producing countries, and repeated the test of existence of convergence for GDP growth and per capita income. The null hypothesis of convergence is approved in both cases for GDP growth and per capita income among oil-producing countries as seen in Tables 3 and 4.

Now, we turn to the non-oil producing countries and repeat the convergence test for this group of countries. The results are summarized in Tables 5 and 6 for GDP growth and per capita income, respectively. We observed that the coefficient on GDP growth is positive and significant, suggesting that the convergence hypothesis is rejected among non-oil producing countries. However, when we used per capita income rather than GDP growth, the results indicated that the convergence hypothesis is approved among non-oil producing countries, since the coefficient on the lag of per capita income is negative and significant.

Conditional convergence

As the absolute convergence theory has been criticized due to ignoring fundamental factors which differ among the countries, we included the following variables that have been generally used in many empirical studies to account for these variations. Like previous section, we implement Fixed Effects model to test the convergence hypothesis among two groups of countries in the Middle East.

The list of variables we used includes:

1. G/Y Share of government consumptions to GDP
2. k : per capita capital
3. $(X+M)/GDP$: index for openness, where X and M represents exports and imports, respectively.
4. SEU : secondary schooling
5. Inf : inflation rate

Table 1. Absolute Convergence for GDP growth for the entire sample.

Variable	Coefficient	Prob
Constant	-0.13 (0.04)*	0.001
Y_{t-1}	0.05 (0.01)*	0.000
R-Squared	0.26	
Durbin Watson	2.06	

Table 2. Absolute Convergence for per capita income for the entire sample.

Variable	Coefficient	Prob
Constant	6.69 (0.72)*	0.000
y_{t-1}	-0.84 (0.09)*	0.000
R-Squared	0.42	
Durbin Watson	2.24	

Table 3. Absolute Convergence of GDP for oil producing countries.

Variable	Coefficient	Prob
Constant	0.59 (0.28)*	0.04
Y_{t-1}	-0.16 (0.08)*	0.05
R-Squared	0.22	
Durbin Watson	2.24	

Table 4. Absolute Convergence of per capita income for oil producing countries.

Variable	Coefficient	Prob
Constant	1.56 (0.6)*	0.01
y_{t-1}	-0.18 (0.07)*	0.01
R-Squared	0.32	
Durbin Watson	2.17	

Tables 7 and 8 represent the conditional convergence for the entire sample for GDP growth and per capita income,

Table 5. Absolute Convergence of GDP for non-oil producing countries.

Variable	Coefficient	Prob
Constant	0.24 (0.06)*	0.000
Y_{t-1}	0.09 (0.02)*	0.000
R-Squared	0.36	
Durbin Watson	1.71	

Table 6. Absolute Convergence of per capita income for non-oil producing countries.

Variable	Coefficient	Prob
Constant	6.06 (0.95)*	0.000
y_{t-1}	-0.85 (0.13)*	0.000
R-Squared	0.42	
Durbin Watson	2.22	

Table 7. Conditional Convergence of GDP growth for the entire sample.

Variable	Coefficient	Prob
Constant	1.18 (0.24)*	0.000
Y_{t-1}	-0.28 (0.07)*	0.000
G/Y	-1.72 (0.26)	0.000
k	2.3E-7 (8.8E-7)*	0.79
$(X+M)/GDP$	0.004 (0.008)*	0.61
SEU	1.33E-9 (1.07E-9)*	0.21
Inf	0.0007 (0.0004)	0.07
R-Squared	0.42	
Durbin Watson	2.12	

Table 8. Conditional Convergence of per capita income for the entire sample

Variable	Coefficient	Prob
Constant	7.23 (0.12)*	0.000
y_{t-1}	-0.91 (0.01)*	0.000
G/Y	-1.73 (0.5)	0.000
k	9.42E-5 (9.71E-7)*	0.000
$(X+M)/GDP$	0.004 (0.007)*	0.56
SEU	1.89E-7 (9.83E-10)*	0.05
Inf	0.0004 (0.001)	0.65
R-Squared	0.99	
Durbin Watson	1.7	

Table 9. Conditional Convergence of GDP growth for Oil producing countries

Variable	Coefficient	Prob
Constant	2.1 (0.4)*	0.000
Y_{t-1}	-0.56 (0.11)*	0.000
G/Y	-0.96 (0.35)	0.008
k	7.4E-6 (1.48E-5)*	0.61
$(X+M)/GDP$	0.04 (0.04)*	0.27
SEU	-4.81E-8 (2.22E-8)*	0.03
Inf	0.001 (0.001)	0.32
R-Squared	0.41	
Durbin Watson	2.37	

Table 10. Conditional Convergence of GDP growth for non-oil producing countries

Variable	Coefficient	Prob
Constant	1.31 (0.39)*	0.001
Y_{t-1}	-0.31 (0.11)*	0.007
G/Y	-2.3 (0.41) *	0.000
k	3.37E-8 (9.26E-7)*	0.97
$(X+M)/GDP$	0.001 (0.008)*	0.89
SEU	1.86E-9 (1.07E-8)*	0.86
Inf	0.0008 (0.0005)	0.14
R-Squared	0.56	
Durbin Watson	1.92	

respectively. As can be seen in both cases, conditional convergence is approved since the coefficient on the lagged GDP and per capita income is negative and significant, in other words, accounting for differences in government consumption, per capita capital, openness, schooling and inflation rates, GDP growth and per capita income in Middle East countries seem to convergence. We were unable to reject the null of conditional convergence among these countries.

We repeated the test for both oil-producing and non-oil producing countries in the region to see whether the convergence still exists and whether the speed is different between these two sub-groups. Tables 9 and 10 represent the result for oil-based and non-oil based countries, respectively. As can be seen in both cases, the coefficient on lagged GDP is negative supporting the null hypothesis of conditional convergence. However, the absolute value of lagged GDP for oil producing countries is 0.56, whereas this variable for non-oil producing countries amounts to 0.31, indicating higher tendency for conditional convergence among oil-producing countries as expected. As a matter of fact, oil-based countries have more similar structure and are expected to converge more rapidly than non-oil producers who have different structures and are at different stages of development. One of the issues that have not been addressed in this

paper is to what extent external variables such as FDI, foreign interest rates, terms of trade, and oil shock will affect the economic growth and convergence among Middle East countries, particularly among non-oil producers. Indeed if we include these variables within the model, how will it affect the speed of convergence among the countries in the region?

Conclusions

In this paper we used fixed effects model and Hausman technique to test the null hypothesis of convergence of economic growth among Middle East countries for the period of 1995-2005.

The dependent variable was the growth rate of real GDP growth and per capita income. The only independent variables for the absolute convergence model are a constant and the log of initial GDP growth or per capita income. Our results support the existence of convergence for the per capita income but not for the GDP growth. We also found that the absolute convergence is rejected for non-oil producers when we used GDP growth. We also carried the tests for conditional convergence including fundamental variables such as government consumption, per capita capital, inflation, openness, and secondary schooling. Our results suggest that conditional convergence has been approved for both entire sample as well as for the oil producing and non-oil producing countries. However, the speed of convergence is higher for oil producing countries than non-oil producers, reflecting the substantial differences in the fundamentals of non-oil producers.

As a matter of fact, oil producers have more similar structures and are expected to converge more rapidly than non-oil producers who have different structures and are subject to different shocks. An interesting topic for further discussion is to see how external variables such as FDI, foreign interest rates, terms of trade, oil shocks, and sanctions will affect the convergence of economic growth among Middle East countries, as well as speed of convergence.

REFERENCES

Barro R, Martin XS (1990). Economic Growth and Convergence across the United States, NBER, Working, p. 3419.
Baumol W (1986). Productivity Growth, Convergence and Welfare, what the long-run data show, Am. Econ. Rev., 76(5): 1072-1085.
Fagerberg J, Verspagen B (1996). Technology, Growth, and Unemployment across European Regions, Regional Stud., 31(5): 457-466.
Hausman HA (1978). A Generalized Specification Test, Economics Letter, 8(3): 239-245.
Islam N (1995). Growth Empirics; a Panel Data Approach, Quarterly J. Econ., 113(1): 325-329.
Maddison A, William B (1986). Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment, J. Econ. Literature, 25: 649-698.
Pesaran H, Shin Y, Smith R (1999). Pooled Mean Group Estimation of Dynamic Heterogenous Panels, J. A. Statistical Assoc., p. 94.
Romer D (1986). Advanced Macroeconomics, NY, McGraw-Hill Inc., NY, third edition.
Romer PM (1994). The Origins of Endogenous Growth, J. Econ. Perspectives, 8: 1.
Solow R (1956). A Contribution to the Theory of Economic Growth, the Quarterly J. Econ. Growth, 70: 1.
Tondl G (1999). What Determined the Uneven Growth of Europe's Southern Regions? An Empirical Study with Panel Data, University of Economics and Business Administration, Vienna.