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Coming Closer to the Rich

Prabirjit Sankar

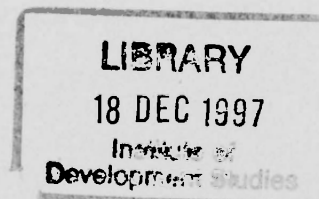
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**ARE POOR COUNTRIES COMING
CLOSER TO THE RICH ?**

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Are Poor Countries Coming Closer to the Rich?

Abstract

The growth patterns during the last three decades did not show any sign of convergence. A typically poor country in the early 1960s did not experience a higher real growth. Hence there is no catching up of the standard of living of the rich countries by the poor countries.

Neoclassical Growth Theory and Its Convergence Implication

Are poor countries growing faster than rich countries and coming closer to them? Recently this has been a much-debated question in the so-called mainstream economics. This spurt of debate owes much to the so-called 'new' growth theory propagated by Romer(1986,1990), Lucas(1988), Rebelo (1991) and many others. The new growth theory came as a challenge to the old - neoclassical- growth theory pioneered by Solow(1986) and Swan(1956). Bringing in the role of human capital formation in growth, technical progress was endogenised and the law of diminishing returns to reproductive capital -the important cornerstone of the neoclassical growth theory - was questioned. A divergent growth pattern was now expected in contrast to the convergence implication of the neoclassical model.

In the neoclassical model, poor countries with low ratios of capital to labour, have high marginal products of capital and high rates of return to capital; hence they tend to grow at high rates. 'This tendency for low-income countries to grow at high rates is reinforced in extensions of the neoclassical models that allow for international mobility of capital and technology' (Barro, 1991, p.407).

The New Growth Theory and its Divergence Implication

The new growth theory assumes constant returns to a broad concept of reproducible capital which includes human capital; hence the growth rate of per capita product is independent of the starting level of per capita product. Romer(1990) took human capital as the key input to the research sector which generates

new products or ideas. So countries with greater initial stocks of human capital experience a more rapid rate of introduction of new goods and tend to grow faster. Thus the convergence implication of the Solow-Swan neoclassical growth theory has been theoretically challenged.

Convergence Debate in Historical Perspective

Both the convergence and divergence hypotheses are, however, very old, older than the *Wealth of Nations* (1776) by Adam Smith. An idea of convergence can be found in the writings of David Hume on 'specie-flow price mechanism' (Hume, 1752). This was criticised by Josiah Tucker (Tucker, 1774) who anticipated the essence of the new growth theory (Semmel, 1970; Bagchi, 1992). In Adam Smith's writings, on the other hand, the ideas of both convergence and divergence can be found (Elmslie and Milberg, 1996).

In the early twentieth century, Veblen (1915) analysed the industrial development of Germany and England and pointed out 'the advantages of relative backwardness'. Gershenkron (1952) updated and extended the work of Veblen to include Russia, France and Italy. The essence of the Veblen-Gershenkron 'catching up' hypothesis is that the latecomers in industrialisation tend to grow faster because learning and imitation is typically cheaper and faster than is the original discovery and testing (see also Nelson and Phelps, 1966; Gomulka, 1987).

Parallel to the convergence and catching up idea, the doctrine of uneven development became the core of the writings of the radicals such as Baran (1957), Frank (1967) and the Latin American structuralist/ dependency school.¹ This idea can be

traced in the writings of less radicals such as Prebisch (1950), Singer (1950), Myrdal (1957) and Lewis (1977).

Kaldor (1972, 1985) tried to explain the phenomenon of uneven development through cumulative causation of an initial productivity lead based on the existence of dynamic scale economies. Krugman (1981) formalised a similar idea in a Heckscher-Ohlin framework and showed that the country with a small head start in an industry will go on increasing its productivity advantage over the lagging countries due to the existence of external economies; through free trade it will compete out the lagging countries from the industry.

Statistical Debate in the 1980s

In the 1980s, a fully fledged statistical debate started with the publication of historical time series of 16 industrialised countries from 1870 to 1979 (Maddison, 1982). This led Abramovitz (1986, p.386) to observe:

'These data enable us to observe the catch-up process in quantitative terms over a much longer span of time than was possible hitherto'.

Baumol (1986) used these data and found through his regression analysis a strong evidence of convergence among the 16 industrialised countries: a country with a lower GDP per worker in 1870 experienced a higher rate of growth of GDP per worker over the period of 110 years, 1870-1979. The finding of Baumol (1986) was challenged by De long (1988). He observed:

'... Baumol's regression uses an ex post sample of countries that are now rich and have successfully developed. By

Maddison's choice, those nations that have not converged are excluded from his sample because of their resulting present relative poverty. Convergence is thus all but guaranteed... Only a regression run on an ex ante sample, a sample not of nations that have converged but of nations that seemed in 1870 likely to converge, can tell us whether growth since 1870 exhibits "convergence". The answer to this ex ante question- have those nations that a century ago appeared well placed to appropriate and utilize industrial technology converged?-is no.' (De long,1988, pp. 1138-1139).

Baumol (Baumol and Wolff, 1988) accepted the validity of this criticism and using Summers-Heston (1984) series found a strong evidence of convergence only in the upper income group but an evidence of divergence among the lower-income countries. This pattern has already been noted by others and later on confirmed by many others(see Sheehey,1996). An explanation of this pattern can be found in Abramovitz (1986); he argues that the potential to realise the 'advantages of relative backwardness' depends on certain 'social capabilities' that vary positively with income(for other explanations, see Azariadis et. al.1990 and Becker et al., 1990).

'Conditional Convergence'

Does this rejection of the 'absolute' convergence hypothesis go against the neoclassical growth theory pioneered by Solow (1956) and Swan (1956) and support the 'new' growth theory of Romer (1986, 1990), Lucas(1988) and Rebelo(1991)? Recently the growth theorists have added this dimension to the convergence debate. The cross-country studies of Barro (1991), Mankiw et al. (1992), Barro et al (1992, 1995) and Sala-i-Martin (1996) found no evidence of absolute convergence; rather these studies

observed 'conditional' convergence - the countries that are similar in preferences, technologies, rates of population etc tend to converge in terms of per capita GDP and standard of living. This finding is taken as a support of the neoclassical growth theory as it is pointed out that the neoclassical growth theory predicts conditional convergence - the countries that are similar in all respects except for their initial level of output per capita are expected to converge to the same steady-state level of output per capita. However, using alternative econometric methods, some studies questioned this finding of conditional convergence and showed that the pattern of cross-country growth is consistent with new growth theory and its divergence implication (Durlauf 1996).

Thus the debate has been turned into one of academic interest. It is no longer concerned with the more fundamental issue - whether a typical poor country can catch up with a rich country in the process of growth and development. Nor it is concerned with whether the global income inequality has a tendency to decline in the process of evolution of the world economy. It is basically concerned with whether Solow was right or wrong.

A Critique of the Concept of Conditional Convergence

There is a gross fallacy in the concept of conditional convergence. Poverty and saving-investment rate, for example, are related to each other in mutual causation - known as 'vicious circle of poverty' in the early development economics literature: a poor country is likely to have a low saving-investment rate because of its poverty, and again because of its low saving-investment rate, its productivity is low and so it has low per capita income.

Population growth and poverty are also related. The well-known theory of demographic transition can be mentioned here. In the

post-Second World War period, the poor countries in general passed the first phase of high birth and death rates and low population growth, and reached the second phase of high population growth due to high birth rate and low death rate. The rich countries in general are in the third phase of low population growth due to low birth and death rates. Available data (UNCTAD, 1994, PP.430-5) show that during 1970-91, the rich ('developed market economy' - hereafter called the 'North') experienced an annual average population growth rate of 0.8 per cent while the poor ('developing market economy' - hereafter called 'South')² experienced a population growth rate of 2.4 per cent per annum - the rate is about 3 per cent for the poor Africa. School enrollment rates (emphasised in Barro, 1991) and dependency ratio(emphasised in Sheehey,1996) are also very much connected to poverty in mutual causation.

Technological backwardness is another characteristic of a poor country. Substantial technological gap exists between the poor and the rich. Even for the club of the rich, OECD, Bernard and Jones (1996) found little evidence of convergence of manufacturing technologies over time.

The conditional convergence hypothesis is, therefore, tautological: the standard of living of a poor country will eventually converge with that of a rich country if it possesses the basic characteristics of the rich country - the same advanced level of technological knowledge, the same high saving-investment rate, the same low rate of population growth due to mass literacy (particularly among the women) etc. It sounds ridiculous if one argues that a poor country, say, Ethiopia (with a per capita GDP of \$49 in 1960) or Mali (with a per capita GDP of \$38 in 1960) would catch up with half the standard of living of the USA (with a per capita GDP of \$2877 in 1960) within 35 years(under the 2 per cent

conditional convergence obtained by Barro and Sala-i-Martin, 1992 and 1995 and many others), if Ethiopia or Mali had the same saving-investment rate as that of the USA, the same level of technological knowledge and the same rate of population growth etc.

The whole debate on whether there exists conditional convergence or not is sterile. What is important from the point of view of political economy in general and development economics in particular is whether the present world scenario is one of absolute convergence. This is the issue once bothered David Hume and Josiah Tucker and later on bothered the scholars in Marxist tradition such as Paul Baran and Gunder Frank, the whole Latin American structuralist/dependency school and all sensible scholars in development economics.

Therefore, the present paper is concerned with absolute convergence. It assembles some data from available source and examines the question of convergence. In Section II, the data source, methodology and the findings are presented. Summary and conclusions are given in the last section (Section III).

II

Casual Evidence of Divergence

There are some casual evidence in favour of divergence (United Nations, 1976, pp.700-2 and UNCTAD, 1995, pp.337-41). The per capita GDP of the North in 1960 was \$1500 and by 1993, it became \$21875. During the same period, the per capita GDP of the South rose from \$130 to \$984; that of Africa rose from \$130 to \$536, that of LAC rose from \$320 to \$2959 and that of Asia (excluding the Middle East) rose from \$110 to \$654. In ratio

terms, the per capita GDP of the North was 11.5 times of that of the South in 1960 and it became more than 22 times in 1993. In the case of Africa, the gap became more acute - from 11.5 in 1960, the per capita GDP of the North became about 41 times of that of Africa in 1993. For Asia(excluding the Middle East), the corresponding figures are about 14 and 33 while for LAC, these are about 5 and 7. These figures also point out the growing gap between different regions of the South. The more rigorous study is undertaken below.

The Present Study: Data Source and Methodology

Recent studies on the issue of convergence are mainly based on various versions of the Penn World Table (Summers-Heston, 1991). These series use 'international prices' to adjust for differences in the purchasing power of currencies. More recently, Nuxoll (1994) pointed out that these data have some downward bias in estimating growth rates of poor countries and upward bias in estimating growth rates of rich countries. Hence the series may favour the divergence hypothesis. It was observed:

'International prices are useful for adjusting GDP estimates for differences in price level; they are certainly preferable to using exchange rates. However, using domestic prices to measure growth rates is more reliable, because those prices characterize the trade-offs faced by the decision making agents, and hence they have a better foundation in the economic theory of index numbers' (Nuxol, 1994, p.1434).

Our study is based on national accounts statistics; data are collected from different UN publications. From UNCTAD (1994, 1995), annual growth rates of real GDP per capita are collected for a sample of 110 countries over the period, 1960-93 divided

into a number of subperiods,⁴ 1960-70, 1970-75, 1975-80, 1980-85, 1985-90, 1990-91, 1991-92 and 1992-93. The growth rates are calculated by using data for all the years of each subperiod (not just the beginning and end year data) by fitting an exponential trend equation. From United Nations (1976), the 1960-figures for GDP per capita (in US \$) are collected for all these countries.⁴

By and large our sample selection is determined by the ready availability of data.⁵ The sample consists of 24 countries of the North and 86 countries of the 'South' (42 countries from Africa, 18 countries from Asia, 24 countries from Latin America and Caribbean, LAC and 2 countries from Oceania).

The growth rates of real GDP per capita for each country over different subperiods are plotted against its 1960-GDP per capita (log of dollar values) in a scatter diagram (Figure 1). The scatter of points shows some evidence of divergence. This is confirmed by our regression analysis.

Regression Analysis: Strong Evidence of Divergence

As in Baumol (1986), a semi-log linear relationship is fitted:

$$Y_{it} = a + b \cdot \log X_{i,60} \quad (1)$$

where Y_{it} is the annual rate of growth of real GDP per capita for the i -th country in the t -th period, $X_{i,60}$ is its GDP per capita in 1960, a and b are the intercept and slope parameters (respectively) to be estimated from the data collected here.

The Equation (1) is fitted through the OLS (Ordinary Least Squares)-procedure to the whole sample (110 countries and 867 observations). Table 1 reports the estimates. The estimates of the

Relationship between 1960-GDP per capita and growth rates
of real GDP per capita, 1960-93(selected periods): ALL(110 Countries)

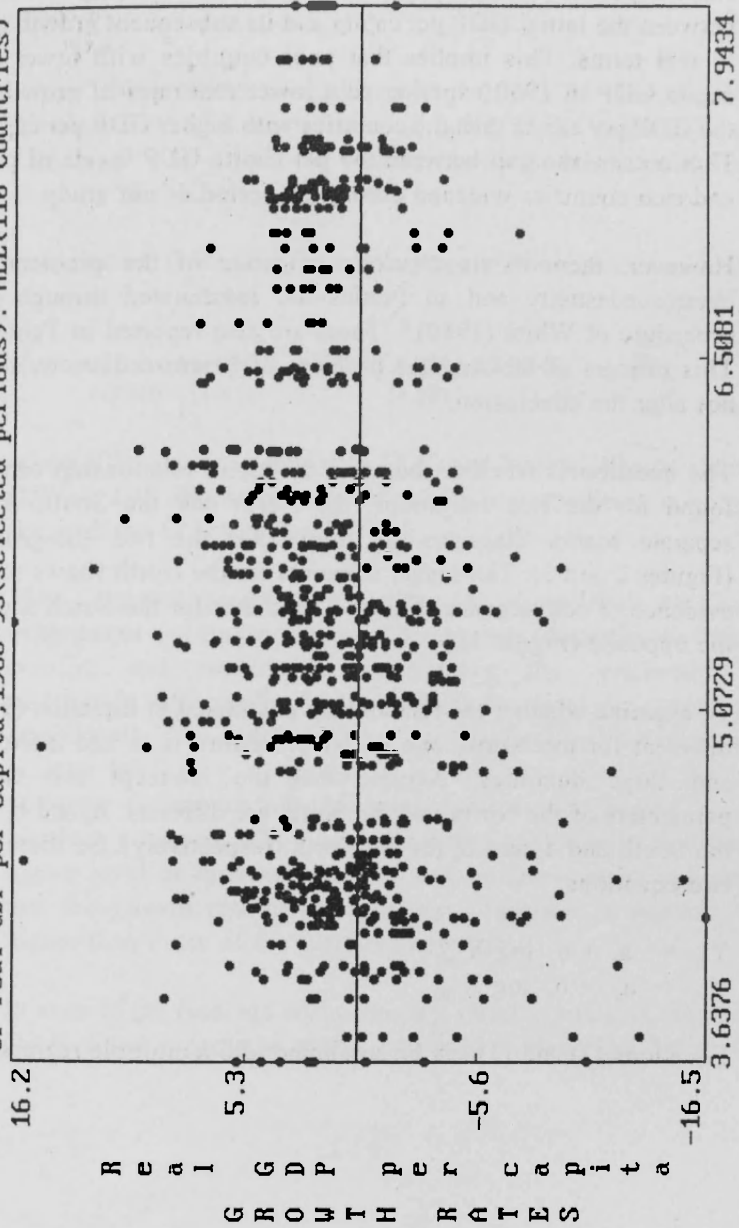


Figure 1

regression coefficient (slope), b and its t -ratio given in parentheses show a positive relationship (of very high statistical significance) between the initial GDP per capita and its subsequent growth rate in real terms. This implies that poor countries with lower per capita GDP in 1960 experienced a lower real rates of growth in the GDP per capita than the countries with higher GDP per capita. That means, the gap between the per capita GDP levels of poor and rich countries widened during the period of our study.

However, there exists a strong evidence of the problem of heteroscedasticity and so t -ratios are reestimated through the procedure of White (1980).⁶ These are also reported in Table 1. This process of tackling the problem of heteroscedasticity does not alter the conclusion.

The question is whether the same divergent relationship can be found for the two subgroups, the North and the South. Two separate scatter diagrams are drawn for the two sub-groups (Figures 2 and 3). The scatter of points for the North shows some evidence of convergence (Figure 2) and that for the South shows the opposite (Figure 3).

To examine whether the relationship postulated in Equation (1) is different for the North, one useful procedure is to add intercept and slope dummies. Assume that the intercept and slope parameters of the North and the South are different: a_s and b_s for the South and a_n and b_n for the North (respectively). So there are two equations:

$$Y_{it} = a_s + b_s \cdot \log X_{i60} \quad (2)$$

$$Y_{it} = a_n + b_n \cdot \log X_{i60} \quad (3)$$

Equations (2) and (3) can be combined into a multiple regression

with the aid of dummies:

$$Y_{it} = a_s + b_s \cdot \log X_{i60} + a_{ns} \cdot DN_{it} + b_{ns} \cdot SDN_{it} \quad (4)$$

where DN_{it} is the intercept dummy = 1 for the 24 countries of the North and = 0 for other countries, SDN_{it} is the slope dummy = $DN_{it} \cdot X_{i60} - X_{i60}$ for the North and = 0 for other countries, $a_{ns} = a_n - a_s$ and $b_{ns} = b_n - b_s$.

Equation (4) is fitted to the whole sample. The estimated equation is:

$$Y_{it} = -4.28 + 1.06 \log X_{i60} + 9.9 DN_{it} - 1.61 SDN_{it} \quad (5)$$

(-3.80) (4.85) (4.21) (4.42)

where $R^2 = 0.04$, $F = 12.43$ and Durbin-Watson statistic (DW) = 1.45 (White estimate of t-ratios in parentheses in view of the problem of heteroscedasticity).

The estimates given in Equation (5) show that the South experiences a strong evidence of divergence (the estimate of b_s is positive and statistically significant); the relationship is structurally different for the North (both dummies are statistically significant). The values of the coefficients of the dummies indicate that $a_n > a_s$ and $b_n < b_s$ and give the clue that the Southern experience of divergence may not be shared by the Northern countries. The observation of a statistically significant higher level of intercept ($a_n > a_s$) can be taken as an indication that the growth rate of the Northern countries, in general, are higher than those of the Southern countries.

In view of the findings of the dummy variable analysis, Equation (1) is fitted separately to the two subsamples, The North (24

countries, 192 observations) and the South (86 countries, 675 observations). The estimates are again reported in Table 1 (panels 2 and 3). For the North, there is some evidence of convergence - the slope parameter is negative and significant at 5 per cent level. But there exists a strong evidence of the problem of heteroscedasticity. The White estimate of the t-ratio of the slope parameter shows that the convergence is not robust - the slope is not significant at 5 per cent level. At best, it can be concluded that the existing gap among the countries of the North did not widen. The relatively poor countries of the North such as Greece, Portugal and Spain did not come closer to the richer countries such as the USA and Canada.

For the South, on the other hand, a strong evidence of divergence has been found (thereby confirming the findings of the dummy variable analysis). To examine whether the different regions of the South face the same divergent relationship, the dummy variable analysis is conducted for the South-subsample. The fitted regression is

$$Y_{it} = a_s' + b_s' \cdot \log X_{i60} + a_{as} \cdot DA_{it} + b_{as} \cdot SDA_{it} + a_{is} \cdot DL_{it} + b_{is} \cdot SDN_{it} \quad (6)$$

where DA_{it} (DL_{it}) is the intercept dummy = 1 for 42 (24) countries of Africa (the Latin America including the Caribbean, LAC) and = 0 for other countries, SDA_{it} (SDL_{it}) is the slope dummy = X_{i60} for Africa (LAC) and = 0 for other countries; a_s' and b_s' are the intercept and slope parameters for the South (less Africa and LAC); a_{as} , b_{as} , a_{is} and b_{is} are the coefficients of the dummies used.

Fitting Equation (6) to the South-subsample, the following estimates are obtained:

Relationship between 1960-GDP per capita and growth rates
of real GDP per capita, 1960-93(selected periods):NORTH

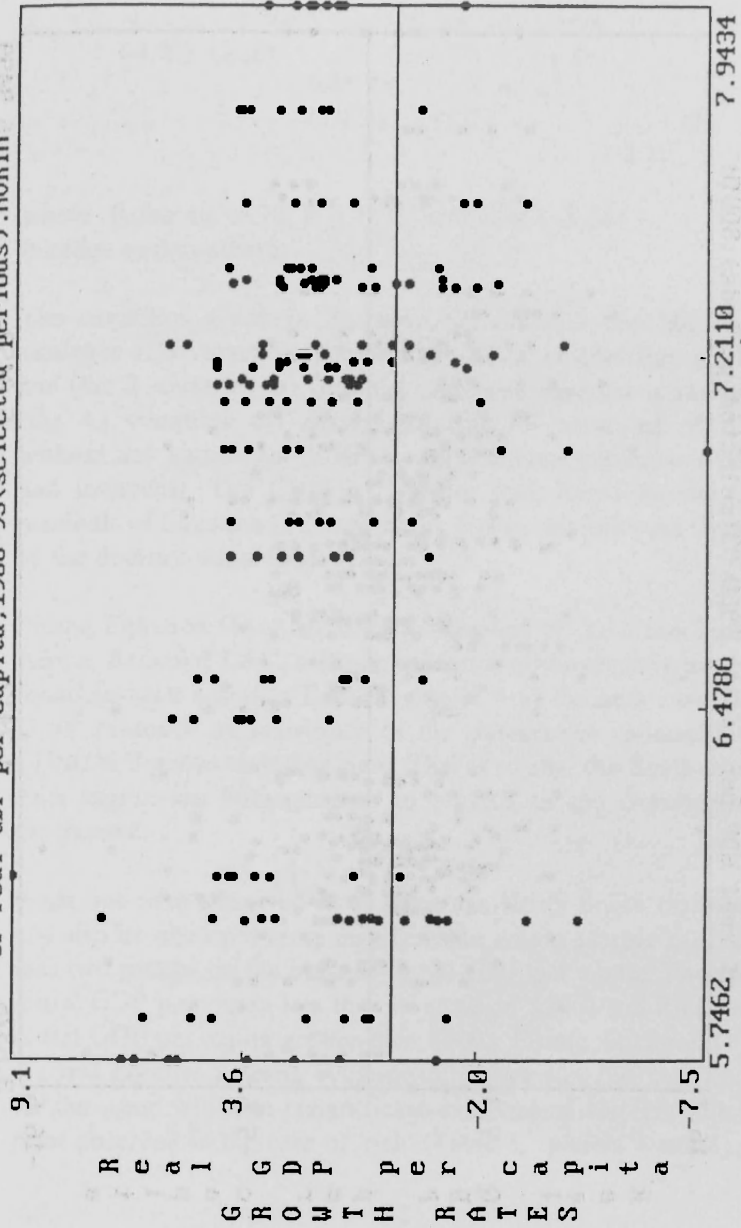


Figure 2

Relationship between 1960-GDP per capita and growth rates
of real GDP per capita, 1960-93(selected periods): SOUTH

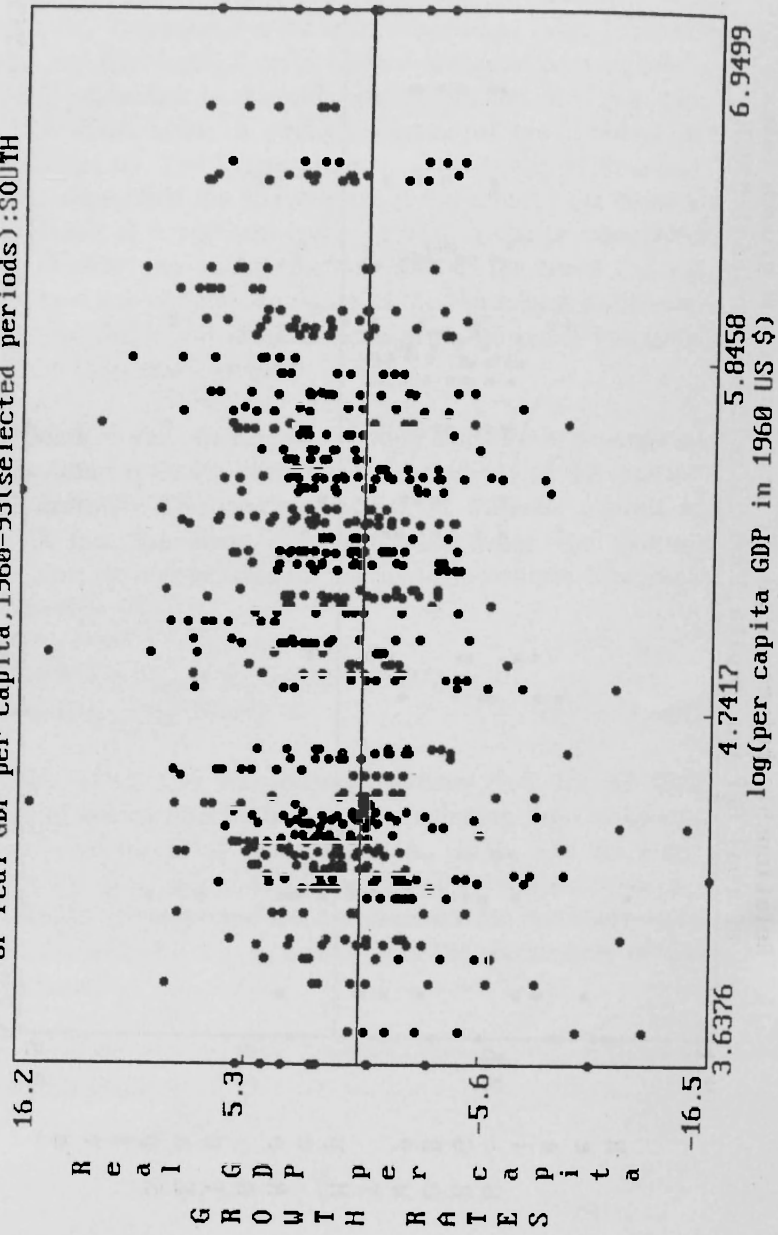


Figure 3

$$\begin{aligned}
Y_{it} = & -4.64 + 1.53 \log X_{i,00} - 0.08 DA_{it} - 0.51 SDA_{it} + \\
& (-1.90) (3.16) \quad (-0.03) \quad (-0.85) \\
& \quad \quad \quad 0.01 DI_{it} - 0.53 SDL_{it} \\
& \quad \quad \quad (0.004) \quad (-0.77) \quad (7)
\end{aligned}$$

where $R^2 = 0.10$, $F = 16.81$ and $DW = 1.56$
(t-ratios in parentheses).

The estimates given in Equation (7) indicate that the strong evidence of divergence experienced by (the 18 countries of) Asia and (the 2 countries of) Oceania combined together is shared by (the 42 countries of) Africa and (the 24 countries of) LAC without any significant difference in structural parameters (slope and intercept). The CUSUM Squares test, based on the OLS residuals of Equation (1) fitted to the South, confirms the findings of the dummy variable analysis.

Fitting Equation (1) to the different regions of the South such as Africa, Asia and LAC, a strong evidence of divergence has been found in each case (see Table 1, panels 4-6). In each case, there is no evidence of instability in the parameters estimated (the CUSUM Squares tests findings). That is to say, the South and its each region are homogeneous in regards to the experience of divergence.

What has been observed by making the North-South distinction can also be observed more clearly if the whole sample is divided into two groups on the basis of initial GDP per capita: Poor (with initial GDP per capita less than or equal to \$500) and Rich (with initial GDP per capita greater than \$500). Fitting Equation (1) to the two groups, a strong evidence of divergence has been found for the 'poor' while an insignificant evidence of convergence has been observed in the case of 'rich' (Table 1, panels 7 and 8).

Reversal of Divergence at the Top?

From the foregoing analysis, the conclusion that follows is that the divergence hypothesis holds good for the relatively low income countries (the South is dominated by these countries); it does not hold for the high income countries (the North is dominated by these countries). Is there any threshold level of initial income level after which the divergent hypothesis will cease to hold? An attempt to answer this question can be made by fitting a quadratic equation to the whole sample:

$$Y_{it} = c + d \cdot X_{i60} + e(X_{i60})^2 \quad (8)$$

where c , d and e are parameters to be estimated.

The estimates (with due care to the problem of heteroscedasticity) confirm the slowing down of the force of divergence with the rise in the initial GDP per capita across the countries (note the negativity of the estimate of e):

$$Y_{it} = 0.57 + 0.0026 X_{i60} - (0.10/10^5) (X_{i60})^2 \quad (9)$$

(2.67) (4.76) (-4.25)

where $R^2 = 0.02$, $F = 8.21$ and $D-W = 1.42$ (White estimate of t-ratios are in parentheses).

Equation (9) shows that the higher the initial GDP per capita, the higher is the growth rate of real GDP per capita; but there is a level of GDP per capita at which the rate of growth is maximum after which the convergence hypothesis holds good - the higher the GDP per capita the lower is the rate of growth. The value of the GDP per capita at which the rate of growth is maximum is given by $d/2e$. Putting the estimates of d and e from Equation (9),

the GDP per capita at which the rate of growth is maximum is calculated; it is \$1300.

On the basis of this threshold level of income, two groups are made: divergent group with the initial GDP per capita at or below \$1300 and the convergent group with the initial GDP per capita above \$1300. Altogether 99 countries belong to the divergent group and 11 countries belong to the convergent group.⁷

Fitting Equation (1) to each group, it is observed that the divergent group experiences a strong evidence of divergence but the convergent group experiences neither convergence nor divergence of statistical significance (see Table 1, panels 9 and 10). This shows that for the top eleven countries who were already rich in 1960, the subsequent growth of real income(per capita) has no relationship with the initial level of income. Excluding these top eleven countries, the others have growth pattern in accordance with the divergence hypothesis.

This conclusion can be contrasted with that of Baumol and Wolff (1988) and Sheehey (1996). Their studies observed convergence for the top 17/14 countries(respectively) and divergence for the rest. Their source of data, sample coverage and period of study are different. Moreover, as Baumol and Wolff(1988) admitted, 'they compare only 1950 and 1980, with no attention to intermediate year figures' (Sheehey, 1996 did not mention the process of his growth rate calculation). Perhaps more important point is that the problem of heteroscedasticity was not given due attention. Our result is also in keen contrast to the formation of convergence clubs of rich and poor, expected in Quah (1996) and in some theoretical growth models (see Galor,1996).

Conclusion

The growth pattern during the last three decades did not show any sign of convergence. A typically poor country in the early 1960s did not experience a higher real growth. Hence there is no catching up of the standard of living of the rich countries by the poor countries. This is true for the North; this is true for the different regions of the South (Africa, Asia and Latin America) and for the South as a whole. There is a strong evidence that the growth patterns are divergent - instead of any catching up, the gap in the standard of living between the poor and the rich countries increased in the post-Second World War period studied in this paper. There is one qualification - the force of divergence slows down with the rise in income (per capita) across the countries and there exists a group of highly rich countries which experienced no divergence among themselves (nor any convergence).

Table 1
 Per capita Gross Domestic Product, 1960 and Its Real
 Rate of Growth, 1960-93:
 Pooled Regression Results

Sample group	a, Intercept t-ratios)	b, slope t-ratios)	R Bar Square	F	D-W
--: Estimates ^a :-					
1. WHOLE SAMPLE (110 countries, 867 observations) ^b					
	-1.96 (-2.94) [-2.99]	0.58 (4.85) [5.32]	0.03	23.52	1.43
2. NORTH (24 countries, 192 observations)					
	5.65 (3.02) [2.73]	-0.55 (-2.05) [-1.89]	0.02	4.21	1.32
3. SOUTH (86 countries, 675 observations)					
	-4.28 (-3.95) [-3.80]	1.06 (4.96) [4.85]	0.03	24.62	1.45
4. AFRICA (42 countries, 326 observations)					
	-4.72 (-2.55)	1.02 (2.62)	0.02	6.88	1.64
5. ASIA (18 countries, 142 observations)					
	-6.11 (-2.90)	1.84 (4.37)	0.11	19.12	1.50
6. LATIN AMERICA & CARIBBEAN (24 countries, 191 observations)					
	-4.63 (-1.88)	1.00 (2.32)	0.02	5.36	1.53

Table 1 contd.

	a, Intercept (t-ratios)	b, slope (t-ratios)	R Bar	Estimate ^a Square F	D-W
7. POOR with 1960-GDP per capita \leq \$500 (86 countries, 677 observations)	-5.28 (-4.54) [-4.34]	1.27 (5.51) [5.37]	0.04	30.32	1.46
8. RICH with 1960-GDP per capita $>$ \$500 (24 countries, 190 observations)	5.63 (1.89) [1.77]	-0.55 (-1.31) [-1.25]	0.004	1.71	1.49
9. Divergent Group with 1960-GDP per capita \leq \$1300 (99 countries, 779 observations)	3.38 (-3.98) [-3.98]	0.87 (5.46) [5.67]	0.04	29.77	1.44
10. Convergent Group with 1960-GDP per capita $>$ \$1300 (11 countries, 88 observations)	0.23 (0.03) [0.04]	0.17 (0.18) [0.22]	-0.01	0.04	1.47

a A simple semi-log linear relationship is fitted:

$$Y_{it} = a + b \cdot \log X_{i60}$$

The equation is fitted through the OLS procedure. Chi-Square and F-tests of heteroscedasticity are conducted on the basis of regression of squared residuals on squared fitted values. If the problem of heteroscedasticity is found, the t-ratios are reestimated on the basis of White(1980)'s covariance matrix. These t-ratios are given in third brackets.

b The whole sample covers 110 countries.

South ('Developing Market Economy' - 86 countries):

Algeria, Angola, Egypt, Morocco, Sudan, Tunisia, Benin, Botswana, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Ivory Coast, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Reunion, Rwanda, Senegal, Sierra Leone, Somalia, Swaziland, Togo, Uganda, Tanzania, Zaire, Zambia (42 countries from Africa); Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Guyana, Paraguay, Peru, Surinam, Uruguay, Venezuela, Barbados, Costa Rica, Dominican Republic, El Salvador, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Trinidad & Tobago, Venezuela (24 countries from the Latin America and Caribbean, LAC); Cyprus, Jordan, Syria, Turkey, Afghanistan, Bangladesh, Hong Kong, India, Indonesia, South Korea, Malaysia, Mynamar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand (18 countries from Asia), Fiji and Papua New Guinea (2 countries from Oceania) .

North ('Developed Market Economy'- 24 countries):

Canada, USA, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, Australia, New Zealand, South Africa and Japan.

Notes

1. For collection of some papers written in this Latin American tradition, see Seers, 1981.

2 In UN compilation of data, the market economy world excludes ex-Socialist countries(former Soviet bloc countries and China). It is divided into two sub-groups - the 'developed' and 'developing'. The 'developed' covers all the 'market economy' countries of Europe, USA, Canada, Japan, Israel, Australia, New Zealand and South Africa. The rest of the 'market economy' countries constitute 'developing' group.

3 For some countries we do not have data for all the periods, 1990-91, '91-'92 and '92-'93.

4 For some poor countries 1960-GDP figures are not available. So we have used 1963 figures for some countries and 1970-figures for some countries. We do not expect any substantial alteration of the basic results.

5 Major petroleum exporters such as Libya, Iran, Iraq, Kuwait and Saudi Arabia are deliberately excluded from the sample. Their real GDP per capita showed high negative growth because of the OPEC strategy of output restrictions and price increase.

6 Under condition of heteroscedasticity, one cannot say with certainty whether the OLS estimated standard errors are too low or too high. White(1980)'s estimate is robust to most types of heteroscedasticity.

7 The top eleven countries on the basis of 1960-GDP per capita are: USA, Canada, France, Germany, Luxembourg, Iceland, Sweden, Switzerland, UK, Australia and New Zealand.

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