Is Catching Up with Developed World's Levels of Skills Possible for Poorer Countries?

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Abstract

Some countries seem to be lagging behind in global accumulation of skills. As the ratio of skilled to unskilled labour is key for growth (e.g. endogenous growth theory), this situation suggests a gloomy future for developing countries. Is catching up with the developed world's levels of skills still possible? The poor performance of the education sector in many countries casts serious doubts on this. This note addresses this question, discussing the simplest necessary conditions for skill convergence. It is shown that the high share of unskilled workers in the inflow of entrants to the labour market may perpetuate low levels of skills endowment, making it impossible to catch up with the developed world. However, education policy could regulate the level and the speed of the accumulation process through suitable strategies.

Resumen

Algunos países parecen estar quedando rezagados a nivel global en la acumulación de stocks de trabajo calificado. Como la relación de trabajo calificado a no calificado es clave para el (por ejemplo, en la teoría del crecimiento endógeno), esta situación sugiere un futuro poco auspicioso para los países en desarrollo. Es posible alcanzar los niveles de acumulación de capital humano de los países desarrollados? El pobre desempeño de los sistemas educativos de los países en desarrollo plantea serias dudas sobre este punto. Esta breve nota analiza esta cuestión, discutiendo las condiciones mas simples para la convergencia en stocks de capital humano. Se muestra que con una participación alta del trabajo no calificado en el flujo de entrantes al mercado de trabajo los niveles bajos de acumulación serán persistentes, y aun podrían perpetuarse, hacienda imposible alcanzar los niveles (actuales) de acumulación de capital humano de los países desarrollados. Sin embargo, se concluye que está en manos de la política educativa el evitar este tipo de situaciones.

1 INTRODUCTION

The issue of economic convergence among rich and poor countries has long intrigued scholars, as, for instance, in the works of Barro (1991), Barro et al (1991), Lucas (1993) and Willamson (1996). In the case of Lucas, the sharp divergence in the income path for South Korea and the Philippines in the relatively short period 1960-1988, with the former overpassing the latter at some point, was an effective motivation for the analysis. Lucas convincingly argues that differential rates of human capital accumulation through schooling and training between these countries are key to explain Korea's phenomenal development.

Actually, the current situation is that many developing countries are lagging behind the accumulation of skills in the developed world. For instance, in most developing countries, the share of the population (aged 25 and older), which has primary education as the highest level of educational attainment is around a half or over; instead, in the US, the United Kingdom, and most of the developed countries, this share is below 10%. On the other extreme, although the share of people with tertiary education in the developed world is more than 30%, in middle- and low-income countries, this is much lower at around 10% or less (UNESCO, 2009). For the Latin American case, Duryea and Pages (2002) have pointed out that "*In general, the prospects are dim because progress in raising average schooling levels has been slow even under the best historical scenarios.*" Also, in this case, the speed has made a significant difference. For instance, comparing South Korea and Uruguay, according to Barro and Lee data set, in 1960 the average years of schooling in Uruguay was 5.3, which was higher than that of Republic of Korea, which was at 3.23. However, during the period 1960-2000, the average attainment in Korea rose by an impressive figure of 7.23 years, compared with that in Uruguay, which only rose by 2.22 years, placing Korea at the skill levels of developed countries.

Thus, some questions arise: What happened? How bad could this gap be? Is there anything that can be done to reverse this situation? These are key questions for many developing countries. As poor countries are lagging behind the global pace of accumulation of skills, the unsatisfactory performance of the education sector seems to be central to the problem; thus, there would be a broad scope for policy action. This note focuses on discussing the catching-up effect in stocks levels, discussing the simplest conditions necessary for

convergence, isolated to the potential link to economic growth, which is beyond the scope of these notes.

This article is organized as follows. Section 2 describes the conceptual framework. Section 3 presents some basic computations of skills generation. Section 4 concludes.

2 SKILLS RATIO PATH

The ratio of economy's endowments is a key element to determine production and trade patterns as well as growth possibilities in most theoretical approaches. Building human capital stocks is the result of the accumulation process determined by the education system; the functioning of the education system heavily depends on internal efficiency and on the availability of resources and budget allocation rules. Moreover, it can be shown that for given efficiency and resources, the ratio of skilled to unskilled labour is determined by the budget allocation. So there is scope to raise this ratio by changing the education policy.

The ratio of stocks of skilled to unskilled labour in the economy $\xi = L_S/L_U$ is modified by the marginal ratio ξ^m of labour inflow, defined as $\xi^m = \Delta L_S/\Delta L_U$, where ΔL_i, $i = S, U$, are the skilled and unskilled flows. The evolution of stocks is driven by $\Delta L_{it} = L_{it} - L_{it-1}$, where L_{it}, L_{it-1} are labour stocks at time t and $t-1$ and $i = U, S$ (unskilled and skill labour respectively).

Considering the evolution of population with constant size generations $E = E_t$, the population growth is linear. a fraction θ (assumed constant over time) of each generation decide not to study while the rest decide to study to become skilled workers. So, the pattern of skill formation is given by $\Delta L_U = \theta E$, $\Delta L_S = (1-\theta)E$. Then the marginal ratio is $\xi^m = (1-\theta)/\theta$.

Property 1: With identical cohorts and infinitely lived workers, $\lim_{t \to \infty} \xi(t, \xi^m, \xi_0) = \xi^m$

Demonstration: The stock ratio is a function of time, the value of the marginal ratio and the initial stocks conditions $\xi(t, \xi^m, \xi_o) = \dfrac{L_{S0} + t\Delta L_S}{L_{UO} + t\Delta L_U}$, which can be rewritten as

$$\xi\left(t,\xi^m,\xi_0\right)=\frac{\xi_0+te\,\xi^m}{1+te}, \text{ where } e=\frac{\Delta L_U}{L_{U0}}.$$ So, the stock ratio is an increase function at

decreasing rates ($\frac{\partial \xi}{\partial t}>0 \text{ and } \frac{\partial^2 \xi}{\partial t}<0$) of the marginal ratio and asymptotical to it

($\lim_{t\to\infty}\xi(t,\xi^m,\xi_0)=\xi^m$). #

Implication 1: The time required will be a direct function of the distance to the target from today's situation and inverse to the marginal ratio: The higher the marginal ratio the shortest the time to reach a target stock ratio will be.

This is so as the target in the stock ratio can be written as $\xi^*=\frac{\xi_0+t^*e\xi^m}{1+t^*e}$, where t^* is the

time required to reach the target ξ^*, from a starting situation ξ_0, given the marginal ratio

and the parameter e (function of the labor active period). Thus, $t^*=\frac{\xi^*-\xi_0}{(\xi^m-\xi^*)e}$, and the

path leading to ξ^* starting from ξ_0 will close faster depending on the values of ξ^m (high or

low).

Implication 2: Convergence to the stock ratio target may be unfeasible.

This is so as, assuming $\xi^*-\xi_0>0$, the target is only feasible when $\xi^m>\xi^*$, as $t>0$; thus, the only problem is not only speed but also feasibility. Also, it is possible to find a marginal ratio such that is required to achieve a stock target in a certain period of time, as

$$\xi^m=\frac{(\xi^*-\xi_0)}{et^*}+\xi^*.$$

3. EXAMPLE

Low marginal ratios are typical in developing countries because of the poorly working education systems. Thus, this situation not only would slow the convergence process but also may perpetuate low levels of skill stocks in the long term. A general interpretation of the results is that convergence to the marginal ratio is so slow in both cases. The increment of efficiency in education through a smaller drop out level increase the ratio stock in the

medium term but is not enough considering achive the target in a reasonable period of time. The problem is that with low dynamic of the population any change in the structure of the population, for example by level of human capital, is slow also.

This can be seen consider as a example the evolution of skill endowments in a typical developing country in Table 1. A poorly working education system produce a low ξ^m=0.258, in this case convergence would take 50 years, perpetuating low levels of the stocks ratio. A better performance of the education system producing an inflow ratio of ξ^m=0.355 will converge produce a long term higher levels of the stocks ratio, taking a longer perido to converge (99 periods). However, should the population grow fast the replacement of new better educated generated generations will accelerate the convergence process, as shown in Benchmark B. This scenario shows that even dramtic population growth will not make such convergence very fast, even if the convergence period is reduced from 99 to 68 periods.

Table 1 Simulation resultas: skill convergence

	Benchmark 0	Benchmark A	Benchmark 'B
Population growth rate	0	0	100
θ	0.7	0.64	0.64
Ls/Lu	0.25	0.25	0.25
ξ^m	0.258	0.355	0.355
Convergence period	50	99	68

Source: Own elaboration

4 CONCLUSIONS

Is catching up with the developed world's levels of skills possible for a developing country? The poor performance of the education sector in many countries casts serious doubts on this; however, education policy could regulate the level and the speed of the accumulation process by means of suitable strategies. This note addresses the questions of convergence, pointing out that the problem might be one of unfeasibility. It is argued that

the high share of unskilled workers in the inflow to the labour market may perpetuate low levels of skill stocks, making it impossible to catch up with the levels of skills of the developed world.

But not only feasibility matters as also it is important to take into account the speed of convergence from the stock ratio to the marginal ratio. How bad could this be? Gloomy long-term perspectives could be avoided or reversed, if the share of graduates in labour market entrants increases significantly. The simulations performed for a typical developing country show that the demographic growth that replaces the older less educated generations by better educated generations would not be enough to speed significantly the rise in the stock levels. Recommendations are not obvious, but as the budget size and allocation are key policy variables to make it, these could be central tools to speed the process. The analysis also suggests that any measure aimed at reducing education systemic inefficiency would enhance the skill-to-unskilled ratio.

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