

Health, Human Capital and Economic Growth

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First, I will provide an overview of the most recent developments in the fields of income distribution and economic growth in order to put the previous presentations within the context of an appropriate theoretical framework. I will very briefly address the relationship between population growth, human capital (broadly defined as education and health), and the transition of economies from stagnation to economic growth.

If we look at economies over a longer horizon than what is usual (over a longer period of time), it appears quite evident that up until relatively recent times the economies around the world were in a state of stagnation. This stage can be defined as a “Malthusian époque”. In the case of Europe, economies persisted in what I call the Malthusian period roughly speaking until the middle of the eighteenth century. At this point in time the economies in Western Europe started to develop new rates of sustained economic growth. This new period can be divided into two stages: First, there is an early “take off stage” in which you see the initial emergence of sustained economic growth followed by a decline in fertility and eventually a demographic transition that ultimately leads to a second stage with new levels of economic growth. Graph No. 1 shows the development of economies in Western Europe in the last 2,000 years. Here we can see that the type of economic stagnation that we have seen in some less developed countries is not uncommon in the context of human history, in fact if we look at the last two millennia we will see that until the end of eighteenth century the whole world was living in a state of relative economic stagnation, the income per capita being very close to subsistence levels.

Now if you analyze this long period of stagnation, it is quite clear that there is some technological progress. It is not that there is no technological progress at all. In fact, we can see that, evidently, there is some technological progress but the population growth is acting in such a way that it offsets any progress in output per capita. So, when you have an increase in the levels of output per capita, the level of the population growth adjusts and brings back the levels of output per capita to the previous equilibrium position. Now if we analyze this “takeoff stage” that is usually associated with the industrial revolution in Europe in terms of a period of technological advancement, we will see that it is a period during which technological progress improves very rapidly as a result of which the levels of income per capita increase. But if we compare this time of technological progress with previous episodes of technological change in economic history, (for instance the classical periods of Greece and Rome) we see that technological progress occurred indeed earlier in history. However, earlier episodes of technological progress did not generate sustained economic growth whereas the industrial revolution ultimately generated new higher levels of sustained economic growth. It is about this fact that I would like to reflect more in my discussion.

I would like to summarize some of the economic growth theories. These theories were designed to capture within its models the transition from stagnation to economic growth that economies undergo in the long run.

I will argue that human capital, broadly defined as education and health, is instrumental for the understanding the transition from stagnation to economic growth. If you look at the early periods of the economies around the world that I have labeled as the Malthusian stagnation époque, or the Malthusian period we can see that the world was living around the proximity of what one may define as a Malthusian equilibrium. What is a Malthusian equilibrium? In a Malthusian equilibrium, we see a positive relationship between output and population, some technological progress (but very slow as Fogel suggested). In this period as the population grows the technological progress results in proportional increases in outputs in relation to the size of the population so output per capita is unchanged. What is important to note is that over this period, because of the pace of technological progress, the return to human capital is very low and consequently individuals invest very little in education and health and the state of economic stagnation persists. Then, around 1750 for the case of Europe, and later in other parts of the world, we see the early stage of “take off”. In this stage the population growth remains positively related to income per capita, but now the growth rate of output outpaces the rate of growth of the population and ultimately we see the emergence of new levels of sustained economic growth.

What allows economic growth to be sustainable is the so-called demographic transition. The initial equilibrium is a situation in which there is a positive relation between the levels of output and population growth. Due to a demographic transition that occurred naturally (endogenously) and that interrupted this proportional levels of growth for output and population and permitting output to escape from population growth. Consequently an increase in the levels of growth rates of output per capita was allowed to occur.

Note first that, in recent centuries, output per capita grew at a positive and sustainable rate but, in fact throughout most of human history, output per capita fluctuated around a constant level. Secondly, note that population growth throughout most human history was positively related to income per capita but that it is only in the last century that it is negatively related to output per capita and then only in some segments of the world.

It is also very important to note that the relationship between output and population in the context of Western Europe, as you can see in this graph, -“the takeoff” of these economies- is initially associated with an increase in population growth. This emergence of higher levels of sustained economic growth (at a rate of about 2% per year by the end of the period showed in the graph) is also associated with a decline in fertility. It is in reality fertility rate changes and as you can see the demographic transition that is associated with a decline in fertility that is the force that allows income per capita to increase at a sustainable rate.

Now this, of course, is not uncorrelated to the changes of life expectancy, for instance in England. In Britain the same takeoff period that I mentioned before is associated with a

takeoff in terms of higher levels of life expectancy where life expectancy nearly doubled over the course of one century, from roughly speaking 40 years up to about 80 years.

Now when we think about these observations there are some fundamental questions that emerge. The first question is how does one account for the sudden spurt in growth rates of output and population? The second question is what triggered the onset of the demographic transition and how to associate this to the acceleration of rates of growth of output per capita? The third question is, (a question that is directly related to the topic address in this seminar), what is the role of investment in human capital (health and education), in the take off from stagnation to economic growth?

In the previous discussion, it was argued that endogenous growth models are perhaps the right tool to deal with these issues. I think that a recent trend among growth economists is rather to work within the so-called “unified theory growth models”. These models instead of using only exogenous growth or endogenous growth models exclusively attempt to develop a unified theory that combines theories that are Malthusian in nature with theories that are “Solowian” in nature. When I refer to theories that are “Solowian” in nature what I mean is theories that provide a consistent explanation for the growth of the economies in the last few decades as opposed to Malthusian theories that have an analytical timeframe that is much longer, periods of time, not of decades but of centuries.

Some of these ideas have been presented in papers that are related to my own work, a sequence of three papers that have been published in the American Economic Review, but also a more recent paper that will appear in the forthcoming issue of the Quarterly Journal of Economics. What I argue in these papers is that the positive interaction between population and technology during the Malthusian stagnation eventually led the economies to a sufficient increase in the size of the population. This new size of the population permitted technological progress to be sufficiently rapid so as to increase the levels of return to human capital investment. These new levels of return to investments in human capital caused, in turn, individuals to begin to invest more in human capital. Ultimately, this situation of new levels of investment in human capital is what produced the economic transition from a period of stagnation to a new period with higher levels of sustained growth. In a way, this theoretical approach constitutes some sort of “revisionism” of economic history arguing that the period of industrial revolution in Europe was a period of transition from economic stagnation to economic growth, not necessarily only because of the technological progress that occurred during this time, but because of the changes in the levels of investment in human capital that became possible for the first time during this period. What technological progress made possible during the industrial revolution is an increase in the levels of the returns to human capital such that, at the household level, families were induced to substitute the decision of having a larger number of members (quantity) for that of being healthier and better educated (quality). Technological progress allowed households, for the first time in history, to choose between quantity and quality. Lower levels of fertility rates reflected a new emphasis of household decision-making placed upon the “quality” rather than on the “quantity” of its members. These phenomena that occurred at the microeconomic level enabled the countries at the macroeconomic level to separate the positive relationship

between the rates of growth of output and rates of growth of the population characteristic of the Malthusian period. It is the latter phenomenon that ultimately becomes the force leading these countries towards new levels of sustained economic growth.

Now if you think about it in the context of some of the regions that we talked about today then it is quite apparent that during this period as a whole life expectancy in Latin America remains lower than in Western Europe. One can argue these differentials in life expectancy led to differential points in the demographic transition between the two regions. While Western Europe experiences a demographic transition by the end of the nineteenth century in Latin America, on average, it occurs much later on. The links between life expectancy, the return to investment in human capital and the substitution between quantity and quality at the household level is what in reality lead countries to experience a demographic transition. In a way, this demographic transition is a precondition for the economic transition from a state of stagnation to one of sustained economic growth. If you look at Graph No. XX which compares the growth rate of GDP per capita in Western Europe and that of Latin America then you will see that there is a delay in the takeoff in Latin America that is correlated with the delay in the demographic transition and the lack of significant improvements, in life expectancy in Latin America.

During the second part of my discussion I would like to focus on my observations to the second presentation of today that dealt with income distribution, human capital and the process of development. In the morning Nancy Birdsall talked about the fact that there is some confusion in the literature regarding whether inequality is beneficial to growth or whether in fact equality is beneficial to growth. But, what does classical and neoclassical economic theories tell us? Let's review this very briefly. What classical economic theory is saying is that inequality is beneficial for growth because inequality channels resources towards individuals that have a higher marginal propensity to save allowing capital accumulation and thus spurring economic growth. The marginal propensity to save of the rich is indeed higher, and in fact saving is associated with higher rates of capital accumulation. Now, the credit market imperfection approach, which is the theoretical framework of my work, leads to a conclusion that is quite the opposite of that of classical and neoclassical economic theory. In our theoretical framework it is equality that is beneficial for economic growth and not inequality. The argument is simple: If inequality occurs in an economy with credit market imperfections, some individuals have credit constraints a situation that leads to low levels of investment in human capital for these groups which in turn becomes a hurdle for the economy overall affecting the process of economic development throughout the whole economy. When Nancy Birdsall presented these two theories, she said that we don't know yet how to relate these two different theoretical approaches. However, I would argue that in fact there is a very simple way to relate these theories. It all depends which stage you are analyzing in an economy. If you are analyzing the period that corresponds to the process of initial economic development, you will see that it was first fueled by physical capital accumulation. This period would correspond to the first stages of the industrial revolution in Europe which was set in motion primarily by physical capital accumulation. During these stages when physical capital accumulation was most important, one could argue that, given the higher marginal propensity to save of the rich, inequality was good for economic growth. However, due to

complementarities between physical capital accumulation and skills, the economies reached higher levels of returns to human capital investment. When the levels of human capital investment are higher, the returns to human capital investment are also higher which means that during the process of economic development the engine of economic growth starts to be replaced. If before the motor of the economy that permitted to reach sustained rates of economic growth was physical capital accumulation in this new critical period of transition, human capital accumulation becomes the new engine of economic growth. This process of change occurs despite the fact that there is a condition of “arbitrage” in the economy, that is, given credit constraints the individuals cannot invest both in human capital and physical capital

When human capital is the prime engine of economic growth equality is important. In the case of physical capital accumulation all income, all physical capital can be in the hands of few individuals or even in the hands of just one individual and the rate of return will not be affected. However I cannot allow only a few individuals or just one individual to accumulate all the human capital that exists in a society. Human capital is embodied in humans and necessitates of a wide distribution among individuals within a society. This is the reason for the transition of economies from a stage of mainly physical capital accumulation to another one of mainly human capital accumulation as the prime engine of economic growth. This is, in fact, the reason for the change in the role that inequality plays along the process of development. If we consider Latin American economies today or less developed countries in general for that matter, you will realize that most of them can borrow physical capital from abroad but they cannot borrow human capital. These economies are in a stage in which human capital is the prime engine of economic growth and consequently the “imperfect market with credit constraints” model predicts that it is equality that is beneficial for economic growth and not inequality as the classical and neoclassical models predict. Equality as I said at the beginning of my intervention of human capital broadly defined as education and health.