The Importance of Investment in Human Capital: Becker, Schultz and Heckman

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Numerous studies have emphasized on the importance of investment in human capital where the merit goes to the Nobel Laureates of economy like; Gary Becker, Theodore Schultz and James Heckman.

The paper aims to present some of the results of studies of these Nobel Laureates, which focus on the necessity of investing in human capital especially investment in education even in very early childhood, then the investment in the training of workers for the establishment of labor productivity and investment in improving the quality and health of the population.

From the results of their studies we will get the message to policy makers that investing in human capital should be a priority of government policies especially in countries faced with the problem of unemployment. Unemployment is closely associated with education level, the higher is the education level the lower will be the unemployment rate.

Keywords: Nobelists of economy, human capital, education, training, unemployment, economic development, government policies.
Introduction

The Nobel laureates in economic sciences have provided a valuable contribution to theoretical and practical training on the importance of investing in human capital. Their opinion, ratings and suggestions are very important to be used for the developed countries, developing countries and countries in transition as well.

Given the value and importance of the contributions of these world-renowned thinkers, will present some of the results of theoretical and practical studies of three Nobel Laureates on the importance of investment in human capital such as Becker, Schultz and Heckman.

While Becker emphasizes the importance of training to increase labor productivity during the implementation of the various tasks in different organizations, Schultz stresses the need to improve the quality and progress in knowledge as a source of wealth and income. However, Heckman notes a very valid issue that investments should begin in early childhood ages yet started school with the aim of developing "emotional intelligence" as early teachings promote subsequent lessons.

The Importance of Investment in Human Capital

Until the late 50's, economists generally assumed that labor is given and their performance cannot be increased. Sophisticated analysis of investments in education, trainings and others made by Adam Smith, Milton Friedman and Alfred Marshal are not integrated into discussions about productivity.

Later, Theodore Schultz and other Nobel laureates have begun to pay attention and do research regarding of linking investment in human capital for economic growth and other issues related to the economy. Analysis of human capital begins with the assumption that individuals decide on their education, training, health care, by comparing the benefits and costs [1].

The most impressive evidence is that more educated people always tend to earn more than others as in developed countries but also in developing countries. However, no country has achieved a sustained period of economic growth without investing a substantial amount in their
workforce and the majority of studies that have been made to increase contributions and have showed an important investment in human capital [2]

Investing in human capital is the experience that should use especially countries facing the problem of unemployment. Raising the level of education of the workforce to face the challenges of a knowledge-based economy is necessary to increase employment and sustainable economic development.

Kenneth Arrow in his fundamental work "Learning at Work", in explaining changes in the overall productivity of factors, in addition to the analysis of a number of variables takes into account one important variables - investments in training and education - as a way to perfection of work for better use of available technology. Adding this variable (human capital), Arrow has helped in introducing the element of "unexplained" increase the overall productivity of factors in the empirical work [3].

Key variables of the production function by endogenous growth theory are the human capital that includes education, trainings and other investments in the workforce. Indeed, human capital as a factor of production now viewed as complementary to physical capital input in the production function. In analytical terms, the more the country to save and invest in human capital, the faster will be the rate of growth.

According to a study by Barro to 98 countries during the period 1960-86 shows that an average growth rate of output per worker is registered 2.24% per year, about one third (0.76% points) can be explained by changes in physical capital and more than a fifth (0.45% points) from changes in the accumulation of human capital. However, less than half on (1.03% points) remains unexplained factors as part of total labor productivity. Barro in 1995 during the reprocessing of these empirical data, has argued that the main barrier to convergence seems to be inadequate investment in human capital among third world countries [4].

Investing in human capital, particularly in education is essential for sustainable economic development.

First, unemployment rates are higher for less educated workers rather than educated workers. Being unemployed workers receive unemployment compensation from the welfare program, as well as criminality can be increased because some may see this as a attractive alternative source of income. This means that society can benefit from
investing in education because they will pay less for social welfare programs and also it helps to prevent form crimes and the enforcement of laws. Second, political participation and the quality of political decisions can be increased by increasing the level of education.

Thirdly, there are benefits between generations in the sense that the children of parents educated grow under better conditions and get greater care in informal preschool education. Fourth, there are findings that more educated people have great benefit for the whole society [5].

Monetary costs of "buying" of higher education are twofold. There are direct costs in the form of cost of tuition, uniforms, books etc. On the other hand indirect or opportunity costs of going to college are the salaries of which was abandoned due to being unavailable in the labor market after completion of high school. A simple concept of bringing human capital decision graphically is shown in the figure below.

Figure 1: Potential Earnings Streams - Schooling Decision

Using data from the Census of conducted in England found that each year of study with over 12 years reduces the extension of unemployment rate 4% and supplement qualification reduces by 12% [6] and that every year of schooling increases annual average gross domestic production (GDP) by 0.37% and increases the income per person by 10% [7].
It can be drawn from this finding that the availability and quality of human resources are key factors in the development of the country. Educated human resources and well trained become strategic assets to increase regional and local competitiveness. A country with a population of educated and trained has an attractive potential to attract investors [8] and a potential for sustainable economic development.

**Gary Becker, The theory of human capital**

Professor Gary S. Becker received the Nobel Prize in 1992 for having extended the domain of microeconomic analysis to a wide range of human behaviour and interaction, including nonmarket behavior.


Becker is known for research and analysis in human capital particularly on the issues of gaining profit from investments in education and trainings. With his work he has increased hundreds of books, articles, studies, to comment, react and challenge or to expand the original knowledge.

Becker points out that the main source in any company is the people. The most successful companies will be those that manage human capital more effectively, by investing in their employees, encouraging workers to invest in themselves, providing learning environments, including the skills and trainings.

**The theory of human capital**

The Becker’s study has to do with investment in human capital. These investments include education, at workplace trainings, health care and research for information on prices and incomes. They differ in their effects
on profits and consumption, the amount invested, the extent and level of returns in which the link between investment and return is acceptable.

According to most of the data, persons with higher education and skilled earn more than others. This is true for developed countries which have paid particular attention to the role of investment in human capital. Again, inequality in the distribution of benefits and income is generally positively correlated with inequality in education and other trainings. Concrete example, unemployment tends to be strongly associated with education.

Becker notes that the commitment of attention to the economic effects of education and other aspects of human capital does not mean that other effects are less important than the economic effects, but the emphasis is put on the economic effects as relatively recent years are ignored.

Regarding the study of the effects on benefits he treats categories as follows:

a) Training in the workplace
According to Becker formal education is not the only way to invest in human capital. Learning and training outside the school, especially in their places of work. Many workers increase their productivity by learning new skills while are doing the job. Even if the graduates of faculties are not fully prepared for the job market when they finish school, they are provided with formal and informal training programs at their places of work. Training in the workplace is a source for increasing the benefits and they are greater with higher working experience.

Some findings of economists from Columbia University suggest that the total investment in good trainings in the workplace can be almost 2% of GDP.

The amount and duration of the training period depends partly on the type of trainings [10].

Becker has made a distinction between so called general training and specific training in the company.

There are some skills or knowledge that people seek and that they can use in many companies as general training and other knowledge that are very specific to a company. If knowledge specific to the company, with the release of this company become useless knowledge; if you require general knowledge workers while employed they will benefit more than the
company if they leave the company, but on the other hand they know they are paid less. The company should be able and more willing to pay for specific knowledge because it helps keeps the worker in the organization. Workers with specific knowledge to move from one company to another would less willing.

Becker's studies show that workers are willing to ask for general knowledge even if they receive lower benefits. Benefits can vary significantly between companies, industries and countries, and on the other hand there even though benefits changes still we can have less movement of workers. For example, lawyers in France are paid less than lawyers in America. If a lawyer from France migrates to America, it cannot benefit the average income as a lawyer in America, because he or she should invest in learning the English language and the laws and procedures of this country [11]

b) Education
Becker defines school as an institution specializing in the provision of training, which is different from the firm that offers trainings on the production of goods. Some schools offer specializations in one skill (for example dressers) while others, like university offers broader knowledge and more diverse. Schools and firms are often a substitute for specific skills. This replacement is often evidenced by the shift over time from the working experience in the respective schools and vice versa.

c) Other Knowledge
They are also important information regarding the salaries offered by different firms to enable people to seek work in firms that pay more, so investments in information about employment opportunities are also important. For example, a good job can be found by spending money at the employment agency. When the new job requires geographical mobility will then spend time and resources. These costs represent investments in information about job opportunities that will be returned in the form of greater benefits.

d) Increase productive income
Another way of investing in human capital is the perfection of physical and emotional health of workers. Firms can invest in this direction through medical examinations of workers, food, avoid activities that harm workers,
the creation of working conditions such as higher wages, holidays etc. All these affect the productivity of labor. The company must make efforts to encourage workers for better food, housing and better medical care. In other words can be a way of investing in health and welfare of workers in undeveloped countries [10].

As Lawrence Summer assesses, there is no doubt that Becker has profoundly affected the future of economists by demonstrating the high degree of economic power in the context of explanations that cannot be imagined by earlier generations [5].

**Theodore Schultz and investment in the quality of people-the population Economy**

Theodore W. Schultz (1902-1998) in 1979 won the Nobel Prize in Economic Sciences for his work in the study of economic development, with special emphasis on the problems of third world countries.


Economist Theodore Schultz was empirical. Thanks to the special skills of its intellectual, known as a lecturer, researcher and entrepreneur! It addressed the issues of agricultural economics, education and training of workers, the rural regions and developing countries. Visits in the farms where he conducted interviews farmers have brought new ideas related to human capital which have started together with Gary Becker and Jacob Mincer.

He believed that human capital was like any other capital; It could be invested in the education, training, and increase the benefits that would bring improvement of quality and production level.
Shultz related to investments in human capital for the advancement of knowledge is a source of wealth and income. According to him, the decisive factor is the improvement of population quality whilst indicating progress in knowledge.

His major contributions to the theory and practice of economic development associated with the development of agriculture, role of the human factor in this sector and in general the role of investments in "human capital" in economic development in general.

Schultz has spread the idea of educational capital (education) as part of the concept of human capital, which is primarily concerned with the investments made in education. It examined the reasons why Germany and Japan after World War II have had a miracle recovery from a destructive widespread. His conclusion was that the speed of recovery was the result of higher educated and healthy population. According to him, education makes people more productive and thanks to good health they are able to produce.

One of his contributions Saint is the Theory of Human Capital, which has inspired many activities in international development in 1980, motivating investments in vocational education and technical support from the International Financial Institutions System of Bretton Woods as the International Monetary Fund and the Bank World.

His interest in human capital has led to works such as "Economic Value of Education" (1963) and "Investing in Human Capital" (1971) which were the basis for the Nobel Prize in Economics in 1979.

Although it is hard to study his work in the field of human capital it has a contribution other than research and publications. His influence is felt in the strong human capital, directly and personally by hundreds of students that he taught and was their mentor. He has encouraged and pushed forward and has followed for years by sending his drafts or articles recently published works or commenting students. His life has enriched the lives of his students [12].
Investing in people-The economy of the quality of population

This work is a contribution given the economic analysis of population quality. He notes that economic production and human welfare are connected same as in developed countries but also in developing countries. So, the crucial factor is to improve the quality of population and progress in knowledge. This calls into question the views of Adam Smith, David Ricardo and Thomas Malthus’s, which have not been able to predict the economic development of western industrial countries in the first place will depend on the quality of the population.

Analysis of the negative impact of poverty of peasants and illiteracy, as well as proposals for education and training of the population, gave the opportunity to challenge the hypothesis of "product zero" and argue that the educational qualification of farmers is an investment cost low, which provides a permanent increase in their income.

Economic Sciences since poverty is one of the chapters of the book that Schultz has devoted special attention during the presentation of the Nobel Lecture will be presented below. Schultz emphasizes that economic science to understand poverty have recognized the economic science in agriculture, the bulk of the poor earn their income from work in agriculture. He cites Margaret Mend "Humanity’s future is not determined by space, energy and agricultural land area, it is determined by the development of human intelligence"[13].

Schultz highlights two intellectual mistakes that have been made in the work of many economists, the overestimation of the economic importance of land and underestimating the importance and quality of human agents [13].

Overestimation of land

One of the basic theses of recent research is the decline in the economic importance of farmland and increase economic importance of human capital, skills and knowledge.

According to Schultz, even if the Ricardian concept of "original and indestructible powers of the earth" have ever been right now it's not
convenient. There are two reasons why the Ricardian rents land is losing its economic weight:

First, over time the modernization of agriculture turned barren land into a productive source and second, agricultural research allowed full substitutes appearance of farmland.

In almost all countries, these changes are partly the result of scientific research, including research on agricultural inputs yet.

*Underestimating the quality of human agents*

Investments to improve the quality of the population could increase economic prospects and welfare of poor people.

Expectations of human agents, employees and entrepreneurs in agriculture, farmers formed under the influence of opportunities and incentives that are created. These incentives are stated at the prices that farmers will collect their products and prices that will pay for the goods that you will buy. In many countries with low income these incentives are greatly distorted. These distortions are caused by governments that have reduced economic capacity of the agricultural sector to increase its contribution to the economy.

*Achievements in quality of population*

The key point of the analysis is the ratio between profit from additional quality and cost of its security. When profits exceed the costs, then we increase the quality of the population reserves.

Over time the increased demand for quality, as well as adult children reduce demand for quantity. This means that quality and quantity are mutually substitutes. The march towards a higher quality helps selecting the "problem" of population.

*Investing in health*

Human capital theory treats the investment in health. Investing in health has resulted in improved health of the population in Russia may. Thanks to improving the health of the population, in many countries with low incomes has come to the extension of the average life of people. This extension of the
average life requires new incentives for greater education and investments in this direction. Studies Ram-Schultz prove the benefits of labor productivity growth in agriculture of India, as a result of health improvements.

Investing in education

Education or education in general is of great importance for improving the quality of the population. While education represents an investment first and foremost, it is a serious error to be considered all the costs of education as current consumption. This error stems from the assumption that education is only commodity consumption. It is wrong to state education costs are treated as expenses, "welfare" and use sources that reduce the possibilities of "saving". It is equally wrong for health expenditures (as they state and private).

The high-level qualifiers

In many countries with low incomes is growing scientific research ability. There are specialized institutions of scientific research, industrial research sectors and university scientific research etc. Schultz stopped in agricultural research. According to him, the establishment and financing of International Agricultural Research Centers represents an institutional innovation ranking. Fathers who founded this kind of enterprise were the Rockefeller Foundation in cooperation with the Government of Mexico. Also in India investments in agricultural research they have given excellent results. Rate of return of these investments has been around 40%, a level that exceeds the profitability of all other types of investments to increase agricultural production [14].

Regarding the role and importance of qualified high-level, Schultz cites Alfred Marshall: "Knowledge is the most powerful engine of production; it gives us the opportunity to Monopolizing nature and satisfy our needs" [14].
James Heckman, Human capital policy

The Royal Swedish Academy of Sciences decided that the 2000 Nobel Prize of the Bank of Sweden in economic sciences professor James Heckman be awarded (along with Daniel L. McFadden) for His Pioneering work in econometrics and microeconomics.


James Heckman is known regarding its contributions to the role and importance of investment in very early stages of childhood. Heckman by presenting the importance of cognitive and no cognitive abilities explains the possibility of greater benefits through interventions early in the life cycle because early date skills and dexterity skills arise in the future.

The paper "Human Capital Policy" by James Heckman and Pudro Manuel Carneiro (2003), deals with alternative policies for promoting vocational skills, addressed to the various stages of the lifecycle. It is presented importance of cognitive and no cognitive Abilities that are formed early in the life cycle, taking into account the views of the family, racial and ethnic dimensions on education and other socio-economic success.

Heckman in his work emphasizes the advantages of early childhood intervention. According to him how the human mind develops more influenced by its interaction with the parents or the person who is cared for. It depends on the circumstances of nutrition, education and intellectual and emotional stimulation.
Heckman has ongoing studies accompanying a group of children not favored who have had special training before school and have helped to raise IQ.

Perry intervention program to raise children's intelligence initially thought later as a failure, because it was thought that these achievements have lost children at the age of 10. But later, after 30 years, this group of children completed higher education in the minimum of time, gained more, had their homes; they are not living on aid and there are never arrested. Heckman says that the difference was "emotional intelligence" that children have special training acquired during preschool when their knowledge were underway.

The data in detail on the achievements of the program Perry presented in a paper published in the January 2006 "The effects of cognitive and noncognitive Abilities on Labor market outcomes and social behavior" published by James Heckman, Jora Stixrud and Sergio Urzúa, which introduces analysis of the effects of cognitive and noncognitive abilities in wages, education, work experience, professional selection and participation in adolescent risk behavior.

Emotional intelligence is how people are in relation to others, as they are motivated and have the ability to be as insistent. These features, combined with the level of intelligence, help people be successful. Heckman concludes that emotional intelligence to take children from the age of childhood intervention results in a better education, increase their productivity as employees, reduces dependency and reduces crime.

Since the establishment, the Fund "Ounce of prevention end" in Chicago has applied his approach to work with children and families, guided by the belief that it is more effective to promote the development of the healthy child from the beginning of his life child than discussed later [15].

At the current level of funding, traditional policies of tuition, refinements in the quality of teaching, training and other work can hardly be effective in closing the gap. Heckman estimates that community benefits are eight times higher than the costs of programs in early childhood intervention.

Many politicians, law enforcement officers and even more formal academic education institutions establish the central role as the leading manufacturer of skills required by the modern economy. They disregard the
crucial role of families and firms to strengthen abilities and variety of skills required for success in the modern economy.

Making discussions known how skills are formed and developed, focusing on the costs of schooling or education reforms, they put aside source very important non-institutional training skills that are equally important, who are producers of different skills that are important in the modern economy.

Recent research in psychology and knowledge point to the vital importance of preschool years in skills training. Now is the time when human skills and motivation are shaped by family and non-institutional environment.

Early learning brings success later learning and early success of subsequent increases, as well as the early mistakes later lead to errors.

According to Heckman points blind one’s vision of education planners and policy makers is the preoccupation with the results obtained in testing and measurement capabilities recognized as an indicator of success in education and intervention.

Our economic models should consider "dynamic complementarity" that characterizes abilities. This means that they are wrong assumptions that skills at early ages are fixed. They note that they are quite different; because the more skilled people are seeking more skill and more skill than seek are better.

**Figure 2:** Higher benefits from early investments
Source: James J. Heckman, Invest in the Very Young, p.4
The above figure presents two different ideas. The first is a theoretical proposition. For the same level of investment at any age, the benefits are higher in human capital for every additional dollar invested in youth, more than they spent for the elderly (Becker, 1964).

Another issue that is not stressed by Becker is that human capital is the dynamic features in fundamental complementarity. This issue is that learning and teaching the required skills early will make learning easier later. So, as skilled people are find as easy learner comparing with unskilled people.

The second interpretation is empirical description of the current level of expenditure on human resources in the US economy. At this level, returns from investments in the early ages of youth are completely higher than the returns on investments in old generation and with less skill. Thus, the main conclusion is that the efficiency of current level of investment can be increased if investment in human capital reallocated in early young age [16].

Heckman points out that, in times of tight budgets, it is difficult to argue cutting of investments in small skilled workers due to changes in technology may be justified in the political field. Unfortunately, in these times of limited budgets, it is not coment to apply an active investment programs for all persons.

Good datas regarding the use of the available funds wisely show support and political message: to invest more in the early ages of people and improve basic instruction and socialization skills. Heckman estimates that as a society we cannot afford to postpone investing in children until they become adults, nor can we wait until they reach school age, when it is too late to intervene. Since learning is a dynamic process, it is more effective when it begins at an early age and continues into adulthood.

Professionals from different institutions recommend that, if we want the child to be prepared for school, he or she must work hard at home in informal studies than the learning by reading, math and language. Children are born "ready to learn", but we must take care to develop emotional and social development of their own to be able to think deeply and creatively about ways of behavior in relation to others and have confidence in their actions in this district. It is more effective to promote healthy child development from the beginning of his life than untreated childhood later.
According to Heckman social skills and emotional impact on performance in education and employment [16], given his contributions, many thinkers believe that Heckman had the ability to unify theory and data for solving concrete problems.

**Conclusion**

The main wealth of a country are people, therefore investment in human capital, starting from investment in the early stages of the life cycle, should be the focus point and the efforts of the government and social partners in increasing employment and sustainable development by mobilizing so at a higher level all national resources.

This is a matter that should be regulated at the level of the overall development strategy of the country. It is important that the macroeconomic framework to be oriented in investment in education, training and health as human capital components. All economic agents including public authorities, individuals and businesses have a responsibility to increase the level and efficiency of human capital.

Investing in human capital is necessary especially in countries faced with the problem of unemployment and development therefore is a prerequisite for achieving sustainable economic development. This is proven by the experiences of developed countries and the results of studies that have been done by economic thinkers among which are part of the results of theoretical and practical studies such as Becker nobelsiteve, Shultz and Heckman.

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