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The economics of education in Adam Smith's "Wealth of nations"

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Abstract: In "intellectual history" perspective, Adam Smith was able to find out the idea of human capital especially from microeconomic point of view. The result originates thanks to a rudimentary use of the category of the human capital. However, on the basis of other premises this essay attempts also to bring to the fore that the results of Smith's reflection change according to a macro point of view. Paying attention to the increasing of the social product, the importance of knowledge and human resources gains a crucial role in explaining the growth. From this second perspective, human capital realizes the incorporation of the technological element not into the labour but into the capital factor. Under this light Smith is more strictly linked to an approach familiar with the neoclassic theories of growth.

Keywords: Adam Smith, Education, Human Capital

1. Introduction

In Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776), is easy to encounter many parallels with 1960s discussion on economic value of education (Spengler, 1977; Schultz 1992).

Friedrich List underlines the carelessness of Adam Smith in defining the productivity of human resources, because «he illustrates solely by exchange, augmentation of material capital, and extension of market» (List, [1841] 1903, p. 111). However, putting in order the fragmentary nature of the Scottish economist's thought on this topic, the consistency of a series of reflections stands out. Smith's human capital theory, in fact, constitutes a methodological platform for modern economics of education because of its direct influence on the other Classics and because of the presence of a substantial internal coherence.

The "technique" of the human capital evaluation is not adequately developed in the "Wealth of Nations". Mark Blaug (1975) states that Smith was able to mark the way but all the classical economy, with few exceptions, was unable to say anything more on the investment in know-how. All this can be shared from a microeconomic point of view and this essay attempts to demonstrate it in the first paragraph by using the approach to the economics of education. However, on the basis of other premises this essay tries also to bring to

the fore that the results of Smith's reflection change according to a macro point of view. Paying attention to the increasing of the social product, the importance of knowledge and human resources gains a crucial role in explaining the growth. In Smith's case it is possible to define the emerging of a "classical" result of the economics of education which explains the contribution of education by incorporating it into the idea of residual productive factor. This attempt will be the object of the second paragraph of this essay.

Adam Smith's treatment of economics of education is examined under the point of view of "the nature" of human capital, of its sources and of its cost-utility criteria in assessing educational choices. The methodology used in this article is not a "rational reconstruction", i.e. an history of economic analysis that dresses up past ideas in modern garb. It belongs, instead, to Mark Blaug's approach in "historical reconstructions" where «all texts of the past need to be reconstructed» in a modern view and language (Blaug, 2001, p. 151). Furthermore, the attempt is not far from the conception of "intellectual history" used by Schumpeter in the analysis of the past economic ideas (Schumpeter, 1954).

2. The Individual Functions of Income

The consistency of the Smith's interpretation – with a taxonomy related to the categories of the economics of education – originates from the difference in the earnings of jobs and from a rudimentary use of the category of the human capital. Smith starts from explanations that mean the investment in human resources as a refined evolution of the classical theories of the productive consumption. The assumption that leads to differentiate human capital from consumption – i.e. education from luxury goods – originates from a series of reflections which demonstrate how Smith's human capital represents the whole of the productive skills and knowledge incorporated into the economic agents (able to produce income within a system). The qualified human resources are conceived at the disposal of the society productive section. Then the way to the "revolution of the human capital" is opened by Smith because education is exactly placed in the panorama of the economic activities and becomes a particular form of investment distinguished from consumption.

Generally speaking, Gary Becker's analysis (1964) is the first economic contribution to the individual choice to invest in education as far as the theory of price is concerned. The notion of human capital concerns both sides of the market, because the specialization that an individual asks in education is that same one that will be offered in the specialized labour force market. Education therefore is the outcome of an investment of time and money, foreseeing future retributions. At the beginning of every period the individual (or whoever else on his behalf) finds himself face to face with the choice between the closing down of his own working capacity on the market and the acquisition of abilities and specializations in the professions, investing in human capital. The earnings rise according to the investment. The total costs of education are represented by the earnings lost, while the benefits depend on wage and temporal horizon of the investment. The individual will maximize his wealth if, in the specific unit considered, the marginal cost of education and its marginal benefit are the same.

Even if the finding of a central nucleus of the theory remains problematical enough, the consistency of a productive use of human resources pervades Smith's entire work. Starting from the classical *locus* of the tenth chapter of the first book of the "Wealth of Nations", a precise sequence of quotations taken from the 1776 work consolidates a production-definition of human capital:

1. «When any expensive machine is erected, the extraordinary work to be performed by it before it is worn out, it must be expected, will replace the capital laid out upon it, with at least the ordinary profits. A man educated at the expense of much labour and time to any of those employments which require extraordinary dexterity and skill, may be compared to one of those expensive machines. The work which he learns to perform, it must be expected, over and above the usual wages of common labour, will replace to him the whole expense of his education, with at least the ordinary

profits of an equally valuable capital. It must do this, too, in a reasonable time, regard being had to the very uncertain duration of human life, in the same manner as to the more certain duration of the machine. The difference between the wages of skilled labour and those of common labour is founded upon this principle». In this passage Smith states that the dexterity and the labour skills of a man are comparable to a specialized machine which is included in the evaluation of the fixed capital. Therefore the fixed capital consists also:

2. «Fourthly, of the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expense, repays that expense with a profit». In this further passage Smith explains that the acquisition of a personal (human) capital costs like a fixed capital, e.g. a machine or instrument of trade. Finally, in order to underline that the function of the fixed capital is to increase the labour productivity, Smith writes:

3. «The intention of the fixed capital is to increase the productive power of labour, or to enable the same number of labourers to perform a much greater quantity of work». So the aim of training and specialization in human resources becomes productive and it is linked to the idea of investment.

Nevertheless, Smith belongs to that group of classical economists who elaborate the definition of skill for labour as capital, but do not go beyond this. He does not proceed with a measure of the amount of wealth that originates from the human being and he avoids economic calculations in any concrete activity. Smith's insufficiency, from this point of view, may be explained with a simple consideration regarding the great attention reserved both to the real goods and to the physical accumulation of capital: in these concerns he is not able to overcome the dichotomy between productive and non-productive labour and he is more interested in the productive sphere of economics.

The unsuccessful solution of the human capital within a coherent classic (or neoclassic) systematization has two explanations. Firstly, if we accept the illuminist character of the Scottish economist, his trust in the human resources improperly approaches the interpretation of a human capital that reduces the nature of the thinking being to a mere material component. It is exactly this idea, together with the most inclined macroeconomic theorization of the division of labour and social product, to lead Smith's energies far away from the formulation of a complete theory of the human capital, especially if it is developed from the differentials in individual incomes.

Secondly, Smith's analysis develops from the existence of a free-market competition and from the hypothesis of a full trust in its producing social well-being. Hence, the notion of labour

we find in Smith's theory – both that we study its genetic causal aspects in the sense of worth-labour-content or if we want to interpret its allocation and distributive dynamics underlining its aspect of measurement in terms of commanded labour – explains the existence of a positive cost for a labourer that is homogeneous in its unitary measurement across the market. Which in Smith is of worth to the single labourer, *de facto* is extended to all the labour of the system to which we refer. In neoclassical terms we would say that the Scottish author introduces a strong hypothesis to his representative model, for which there are several functions of disutility for labour among the individuals of the capitalist society. Having undergone a sort of normalizing rule, consequentially an equal quantity of labour encloses a fraction of disutility felt with the same intensity by all the labourers of a social class. The case of professional education may be faced making use of a new and different normalizing rule which foresees an additional disutility represented by the pain requested for the training in labour. We should interpret the further strain in terms of investment in human capital. It is the costs of the length of time spent in acquiring labour skills and specializations.

If a theoretical representation of the benefits does not exist, nevertheless the costs are described with a certain amount of care. During apprenticeship, for example, Smith is aware that the entire labour of the apprentice belongs to his master. In many cases the apprentice must be maintained in the meanwhile by parents or relatives who, almost always, must provide him with his subsistence. The training costs are grouped into four typologies and originate from:

1. the directly requested list of rates by the master;
2. the costs supported by the family of the apprentice for his upkeep;
3. not having at his disposal the products of his labour that nevertheless belong to the master;
4. the opportunity cost not being used in another labour which allows income without specialization.

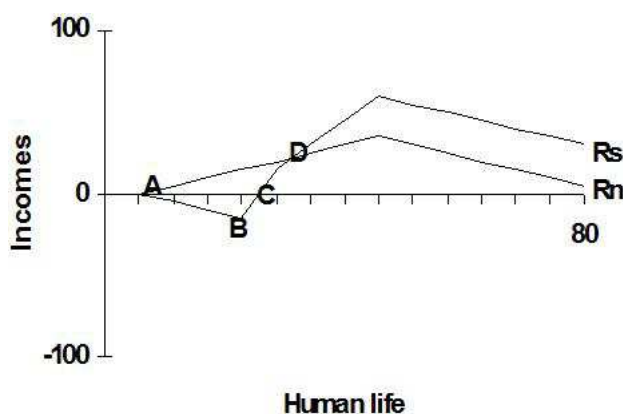


Figure 1. Rates of return by comparing the flows of benefits over a specialized and not specialized working life.

Recalling André Page's model (1971) and hypothesizing that the individual has, at least, the faculty to preside over decisions to undertake or continue his studies, we see Smith sustaining the possibility for the labourer – by his own choice

or on the push of other subjects, such as the family, next of kin etc. – to invest in himself. Fig. 1 represents the flows of income expected with and without specialization (R_s and R_n respectively). In R_n economic agent start his working age in A; in R_s , in A he begins the training period, starting labour only in B. Direct costs (area ABC) constitute the training costs paid from the "person in specialization"; opportunity costs (area ADC) are the non-attained income within the training period.

The reason that leads to invest in labour skills is the expectation of a flow of higher income or, as Smith writes, of a supplement compared to the usual wage of the current labour, «over and above the usual wages of common labour» (Smith, [1776] 1904, vol. 1, p. 103).

The reason that justifies the distance between the two curves of expected income can be found in the tenth chapter of the first book where Smith establishes that «the wages of labour vary with the easiness and cheapness, or the difficulty and expense of learning the business» (*ibidem*). The amount of the differences between specialized and non-specialized income, however, does not seem to be particularly appreciable, or that the investment in human capital does not result to be very productive. Indeed, we should also consider Smith's following remarks: «It is reasonable, therefore, that in Europe the wages of mechanics, artificers, and manufacturers, should be somewhat higher than those of common labourers. They are so accordingly, and their superior gains make them in most places be considered as a superior rank of people. This superiority, however, is generally very small; the daily or weekly earnings of journeymen in the more common sorts of manufactures, such as those of plain linen or woollen cloth, computed at an average, are, in most places, very little more than the day wages of common labourers. Their employment, indeed, is more steady and uniform, and the superiority of their earnings, taking the whole year together, may be somewhat greater. It seems evidently, however, to be no greater than what is sufficient to compensate the superior expense of their education» (Smith, [1776] 1904, vol. 1, p. 104).

With this result the thesis that sustains the assimilation of the investment in human resources to that in capital goods would be contradicted. However, the "Wealth of Nation" is not interested to adopt a coherent explanation, from an analytical point of view, of the definition of the benefits coming from micro investment in human capital. Smith's economic value of education better lends itself as element able to explain the growth of the system. This happens in relation to other factors of production and after having distinguish an aggregate "residue" that we will see in the next paragraph.

3. The Aggregate and the Residual Factor

Education and training show an indirect relationship with the advancement of wealth. Such a relationship is linked to a macroeconomic nature of the analysis and explains the logical consistency of an educational policy (widely recognizable in Smith). Labour as social source of production is important as qualitative aspect with which, also in the aggregate, it is

carried out. The quality of labour interacts together with its quantity in making the final product. This means introducing the technical progress into the explanation of the growth, or that part of the growth which is the result of any educational process (institutionalized or simply derived from the learning by doing).

Before presenting the most adequate framework to introduce the technological progress, it is necessary to cast an eye over the most convincing results in the studies upon Smith's theory of economic exchange. Goods – and also skills and talents – are the results of the market exchange, a process coming from the human inclination to barter and to exchange one thing for another. The original endowment of the market agents consists more in the persuasion than in the disposal of goods. However, introducing the social division of labour a new human skills and resources differentiation takes place. According to Elmslie (1994), nature gives men few or none starting endowments and distributes them almost in equal way. It is therefore the associate life, structured in a system which institutionalizes the free trade system, to define the consequences. According to the "Wealth of Nation", there are no difference in nature between the most dissimilar characters, e.g. between a philosopher and a common street porter. The difference of "talents" between them only reveals itself after they come to be employed in different occupations of the economic life (production and exchange). So the philosopher (scientist) is such because society defines his role thanks to the social division of labour. When the social separation pervades society, differences in skills seem more and more innate in individuals while really they originate from the market process.

Smith, nevertheless, identifies a more complex relationship between man, knowledge and economic growth. If the division of labour solves the social distinction between intellectual and common worker, education influences the progress making great changes in the technique thanks to the inventions of the scientists. Technological change provides an exogenous shock in nature and it is transferred into the economic process only in a following temporal phase, through the endogenous contribution of the labourers with low human capital. They turn the inventions into innovations and facilitate the technical evolution within the productive process. According to Smith, this happens because «a great part of the machines made use of in those manufactures in which labour is most subdivided, were originally the inventions of common workmen, who, being each of them employed in some very simple operation, naturally turned their thoughts towards finding out easier and readier methods of performing it» (Smith [1776] 1904, vol. 1, p. 11).

The connection of inventions with technological development joints together Smith's vision of progress with the typical categories of economic growth. Hence, the ingenious function assigned to the consequence of the division of labour on human resources can be investigated by the economics of education?

The keystone to find a common taxonomy between Smith's vision and the economic educational epistemology is the

inclusion of the technological evolution in a neoclassic production function, as Robert Solow demonstrates. Solow (1957), in fact, puts the technological factor – traditionally intended as a product of the education – in contact with the other factors of production. In his article Solow discusses the hypothesis for discussing the technical progress in an autonomous way with respect to the other factors of production, conceiving it as an element of an aggregate function of production, influenced by time's variables. In that approach, technical change or education constitute a residue and do not influence the other factors in fulfilling the function of producing wealth. However, it explains the social product variations not due to the traditional factors.

This conclusion, which has the merit of respecting the aggregate vision of Smith in his concerns about economic development, is useful to enhance human resources in a balanced or breaking trajectories in the theories of growth (Reid, 1989). Nevertheless, it respects Smith's opinion to conceive the *primum movens* of the technical progress in a separate and wholly specific place, i.e. the intellectual skills of scientists: «Many improvements have been made by [...] those who are called philosophers or men of speculation, whose trade it is not to do anything, but to observe everything; and who, upon that account, are often capable of combining together the powers of the most distant and dissimilar objects» (Smith, [1776] 1904, vol. 1, p. 12).

Knowledge is source of innovation and result of the economic growth. Then human capital can constitute the first or the last contribution to a trajectory of growth. A further Solow's improvement in research (1962) is coherent with Smith's case because allows incorporating the technological element into the capital one. Solow's contribute hypothesizes that technical progress requires being incorporated into recently produced capital goods before being able to show a growth effect on the output. A feature of this model is the consideration of the capital as annual consecutive generations of goods. As Page notes, this approach has the limit of not incorporating the technical progress into the labour factor and of not keeping in mind, consequently, that education is a variable which influences the improvement also in the productivity of labour. Nevertheless Smith develops the idea that education and human capital are related to the introduction of the technological element in the capital factor. He considers the knowledge in the same light as a machine i.e. a fixed capital. That knowledge, which Solow finds no more in the quality of labour, but only in capital goods, allows to prove the existence of producing capabilities in Smith's «great number of machines which facilitate and abridge labour, and enable one man to do the work of many» (Smith, [1776] 1904, vol. 1, p. 9).

4. Conclusions

The great attention placed by Smith on technical progress is pointed out by the division of labour. Thus, we can conclude that in 1776 the idea of incorporating technical progress into the material capital was crucial in importance for investments

decisions. According to the interpretation suggested in this article, Smith prefers to incorporate education and human capital in fixed capital goods, as 1962's Solow approach discusses for neoclassic theory of growth. The preference for a such analytical view depends upon the respect for the macroeconomic nature of Smith's analysis in economic development. Nevertheless an alternative microeconomic lecture is present in the "Wealth of nation". It brings forward several important results developed by the economics of education in the 1960s. Under this light, Smith's early research on this topic not only tends to place emphasis on the benefits of education but could lead governments to an increased emphasis on research into the quality of education and on efficiency in the allocation of resources to education.

It is not always easy to remark conclusions for policy implications from an historical reconstruction. From the perspective of a recent history of economic ideas, however, the impact on the economic policy in the 1960s and in the early 1970s can be characterized by a rapid absorption of the main arguments of the human capital theory into policy discussions, providing some universal theoretical basis for increased public expenditures on higher education (Teixeira, 2000, p. 281). Then, even if Smithian roots of the human capital theory show us – after 1776 – that many things remained to be learned about education, productivity and returns from the analytical point of view, on the other hand, as Zvi Griliches (2001) remarks in his conclusion, in the pursuit of the knowledge we can now see farther than our predecessors because we stand on their shoulders. In this light, Smith's shoulders seem very steady.

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