Human capital, screening theory and education in agriculture

Lidský kapitál, teorie signálů a vzdělávání v zemědělství

A. SOUKUP

Czech University of Life Sciences, Prague, Czech Republic

Abstract: Human capital theory views education as a specific production factor and as a specific sort of capital. Besides this theory, alternative concepts of education were developed. Filter theory which is interested in the selective function of education and created a different point of view of economic analysis phenomena in education. Screening theory is similar and is interested in information of labor market attendants and their deciding. Signal equilibrium states are better or worse according to Pareto's efficiency and according to the higher or lower difference between private and common educational returns.

Key words: human capital, screening theory, filter theory, education, neoclassical theory

Abstrakt: Teorie lidského kapitálu pojímá vzdělání jako specifický výrobní faktor a jako specifický druh kapitálu. Vedle této teorie byly vyvinuty alternativní koncepce vzdělávání. Teorie filtru se zabývá selektivní funkcí vzdělání a vytváří odlišné pojetí ekonomické analýzy jevů v oblasti vzdělávání. Podobná je teorie signálů a zabývá se informovaností a rozhodováním účastníků trhu práce. Stavy signální rovnováhy jsou lepší nebo horší z hlediska Paretovy efektivnosti a z hlediska větších nebo menších rozdílů mezi soukromými a společenskými výnosy ze vzdělání.

Klíčová slova: lidský kapitál, teorie signálů, teorie filtru, vzdělání, neoklasická teorie

The importance of education in the contemporary world, also by the authorities of the European Union, is highly organized and supported. Education asserts itself in the economic development, in the furtherance of Europe to the capability to compete with the world, in the contest with the social unevenness and unemployment and in the development of fully democratic and participating society.

With the aim and importance of education, the theoretical economy has preoccupied this area for several decades. During this time, two basic theoretical trends of economic theory were defined.

The theory of human capital arose in the sixties of the last century on the basis of works of the economists of the Chicago school, to which belonged G. Becker, B. Weisbrod, T. Schultz, J. Mincer and others. Most noted was the contribution of G. Becker.

Its development was committed to a consistent application of the neoclassical economy as a met- hodological basis for the understanding of human behavior. Its principles were applied on the effectiveness of inputs into the human capital, especially into education. Economic subjects allocated their means with the aim of maximizing pure advantage, while taking into consideration alternative costs, risk and principles used by the neoclassical theory.

The theory of human capital states that education is a specific production factor and is a specific kind of capital. Besides this, there were alternative views on education, for instance the filter theory. This accentuates above all the selective function of education and at the same time represents a somewhat different view of the phenomena invested in the framework of economic analysis of education. On a parallel, threre is the screening theory, which is interested in similarity of labor market participants and their decision making. The main representative here is M. Spence.

MATERIAL AND METHODS

Education as a filter

Screening theory rates education above all as an measure enabling selection between educated individuals according to their applicable qualities. At first, one considers the selective function of education. It does not accept the neoclassical premise of perfect acquaintance. The level of knowledge the potential employer has comes from the signals contained only by a limited amount of information. One of these signals is education. The employer makes selections, however, according to other signals, such as race, sex, age etc.

From the point of view of the filter theory, education is of less importance than the rising of productivity, but education informs about the amount and quality of human capital. Therefore, the level of capability and the desirable properties occurs with the individual even before their professional preparation begins. The significance of education is in their demonstration of the acquaintance of the subject and the labor market. The significance of education therefore serves as a signal of the labor market.

Effectiveness of education depends on the ability of the market to allocate the needed individuals on the corresponding variances, so on the level of successful education it is achieved by its selective function. Filter theory considered education as secondary. The effectiveness of education is more important, however differently productive individuals dispose of it. The extension of education in society is decreasing the contents of the respective signals.

As stated by F. Hirsch: "Education is in its economical function the filter and factory. The extension of the number of diplomas means by itself a decrease of the number of signals from the individual diplomas" (Hirsch 2000, p. 48). The extension of education in society owes wide support from the part of government as well as from offer institutions, as it accrued in the sixties and seventies of the last century in the developed countries, can lead to reduction of its importance from the point of view of reaching a better job.

Hirsch anticipated the importance of the broad extension of university diplomas. And after testimonies of the gained degrees of education, which need not be only positive.

Accentuation of the selective function of education gained a new importance only several decades later. More important is the analysis of education's influence in its role as a signal.

Education as a signal

The significance of a market signal and its function on markets, in this case of the labor market, M. Spence (1998) defines market signals as the activities or properties of individuals in the market, which change ideas and expectations of other individuals participating in the market. This very broad concept of the signal contains such different phenomena as prices, advertisements, advertising notice etc.

In labor markets, we meet with special signals. In the same way as in all markets, there take place processes of communication and exchanges of information. The potential employers are mostly unsure of the qualities of the person interested in employment. This is the question of investing under conditions of risk and uncertainty.

However, in a similar situation each buyer in the market sees that the degree of risk is sometimes higher. The corresponding mechanics of elimination (or reduction) of the risk are specific for different markets. In the labor market, the inquiring can adhere to certain ascertainable or presented features of the potential employee, like education, image, past employments, but also ethnic persuasion or conceivably race and sex. These are the examples of signals on the labor market.

An important constituent of the stated concept is expectation. Preconditions that the individuals are learning on the basis of experience and are revising their preceding estimations. In such cases, the market react differently from the previous ones. The screening theory is complemented by the hypothesis of persistent corrections of economic estimations.

A typical transaction on the labor market is bilateral, the employee is selling for a time his/her working abilities and the employer is buying them. The worker is the offerings side and the employers the inquiring side. The quality working services is, however, for the employer uncertain, he is buying a possession under the conditions of risk and uncertainty, likewise the employee is buying a possession having unknown properties. Here is the working milieu and further proprieties, while wages are the pure transfer resulting from this transaction. None of the two sides (employee, as well as employer) can at the moment the transaction concludes be sure, what characteristic feature has exactly been submitted by the other side. That is to say, the employee does not know what the potential working milieu will look like and the employer does not know how well the employees will work how productive his/her services will be. Both adhere in this situation to the certain affirmation (expectation) of the future state.

Equilibrium in the labor market sets in. If the expectations of the employers concerning the relation between the productivity of the worker, which at the moment of hiring was unknown, and his features (education, working experience or further features) are confirmed by the real results of his work. The employer does no more correct his expectations. The same should apply to the employee from the point of view of his expectation and the real state of affairs. Spence calls them signal equilibrium.

The employer can to an extent reduce this on the basis of his past experiences and also on the basis of signals. This is a potentially useful information in the form of explicit characteristic features; such as level and type of education, personal characteristics, he can also take his bearings according to the impressions and other signals, which are not necessarily "rational" in the current sense.

Acquiring of this information may require certain costs, the employer compares the returns from their obtaining and cost for their acquiring. Jervis (1987) classifies signals like this:
– Potential signal – represents observable changeable characterization of the individual.
– Potential index – represents observable unchangeable characterization of the individual.

The actual signal (index) is a potential signal (index), which affects the probable estimation of the employee's productivity on the part of the employer. Potential signals and indexes can thus change into actual ones, if they begin to influence the expectation of the employer. One of these is education.

The employer could determine the productivity of the individual and regulate him according to it, but in reality it takes time, before the latent abilities of the employee become apparent. He gets certain signals from the type of school education, or for instance prestige of the graduated university etc. for the potential employee the education as a matter of choice. The number of years and kind of education represent for him financial and psychical cost (including alternative ones). The problem is his estimation of the optimum level of education.

For the employer it is at least, to a certain extent, advantageous to acquire information contained in signals, because using accessible information about talented people means for him an advantage in competition with other employers. As long as other employers use this information, he would begin to fall behind them and his ability to compete would recede.

Education as a signal can be analyzed according to the following questions:
1. How is it possible to characterize the state of signal equilibrium?
2. To what extent are participants in the labor market (employers and attendants) informed about the appropriateness of this and to what extent is this information complete and reliable?
3. Are signals as a source effectively employed?
4. Are featured signals representative?
5. What role does the demonstration and function of signals the process of learning play?
6. How big a role is played by uncertainty (imperfect information, misleading demonstration of signal activity) in the market?
7. How does this uncertainty influence the allocation of the labor market?
8. How many equilibrium states do exist and are they on the same level?

Even if specific signal effects are sporadic in the labor market and require special investigation, they represent only one effect of signal activity, which appears in all economic markets. Their big significance leads to the fact, that signal activity begins to be investigated here. But the importance of acquaintance and of further effects of signal activity is also outside labor markets. Their investigation is henceforth an open question.

Example of signal effects

Let us presume there is one employer and a group of people applying for work. Each individual is able to produce a certain final product. But his/her work is unknown to the potential employer. For simplicity, there will be only two final values of the final product: 1 and 2. If perfect information were a function, the employer would pay in the form of the wage that is equivalent of the two values of the final product (1 and 2) to his employees.

Presume that the share of the individual in the final product 1 is equal to n and the share of individual will be a final product 2 is equal to $1 - n$.

But perfect information is not valid and the employers must decide whom he will engage on the basis of his/her past experience, observable properties of the applicants and his own expectations. The results of these estimations can and need not be in harmony with the real abilities of the applicants. The employers will pay the wage to the engaged workers on the basis of the expected final product.

If this expected final product is be the same for everybody, as if there were no signals, nor indexes, it would look like this:

$$W = n + 2(1 - n) = 2 - n$$

Compared with the situation of perfect information, the individuals with the final product 1 would be treated preferentially, as they would be undistinguishable from the members of the group with the final product 2. These on the contrary would be discriminated. The return of an individual in the first group (mp = 1) is increasing, when n is decreasing, harming the return of the individual in the second group from raising, when n is increasing.

The employer essentially needs to take interest in distinguishing between the members of both groups, because the total amount of work and the paid wages are the same.

If better information is accessible, for the employer it is more advantageous to employ it, as it means his higher return in comparison with the situation with zero information. If we presume the existence of other employers utilizing information contained in signals, our employer would be certainly handicapped. If he wants to keep up in the market, he must employ his information.

CONCLUSION

The filter theory views the level of the achieved education as a relative index, which is far more affected by the level of education achieved by other individuals, than by the absolute level of education. It is above all an element of selection, whose other feature is secondary.

If a higher education in the society is more dispersed, it does not guarantee to its bearer an advantage as in the case, when the share of educated people is lower. F. Hirsch and other theorists in this direction are not so interested in the effectiveness of education as such, but in its broader impacts.

The concept of education in the signal theory complements the neoclassical concept of the human capital theory rather than to negate it. Deciding on conditions of risk and uncertainty in contemporary times is the subject of the new classical theory's investigation. It is also developing the analysis of situations of imperfect information, as in this case.

M. Spence's et al. theory accentuates the significance of signals in the labor market. Education is one such signal. Spence understands that equilibrium in the labor market is such a state. When the expectation of participants in the market (especially employers) are confirmed by reactions in the market, there is no need to correct this further. Spence consequently understands equilibrium as a state, when expectations are in harmony with reality (correct expectations). This state can be called signal equilibrium. It occurs in the process of gradual adaptation. Owing to the appearance of signals, some participants in the labor market are gaining while other are losing. Education as a signal leads the employers to decisions which they make on the basis of the minimax principle (maximization of returns and minimization of cost) in harmony with the principles of the neoclassical theory.

The signal theory does, however, also refer to the possibility of imperfect acquaintance, thus limited implication ability of signals, including the education signal. Signals concerning differences between employees, which the employer uses for his market decisions, need not contain an important information, they may distort or change their meaning. The possibility of an incorrect decision in the sense of suboptimal allocation, which does not bring the maximum advantage, is, according to his theory, just as possible as achieving of the optimum allocation of sources. The signal theory represents an important deepening of knowledge concerning the function of education in the contemporary economic theory.

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Contact address:

Alexandr Soukup, Czech University of Life Sciences, Kamýcká 129, 165 21 Prague 6-Suchdol, Czech Republic
tel: +420 224 382 334, e-mail: soukupa@pef.czu.cz