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HUMAN CAPITAL ASSESSMENT
UNDER ECONOMIC CRISIS

The paper summarizes the concepts of contemporary researchers of labor economics, the issues of investment and the structure of human capital are considered. Mincer wage equation modifications are introduced. Possible models for assessing human capital under crisis are analyzed.

Keywords: human capital; return rate; education; health; cultural capital; wages.

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ОЦІНЮВАННЯ ЛЮДСЬКОГО КАПІТАЛУ
В УМОВАХ ЕКОНОМІЧНОЇ КРИЗИ

У статті узагальнено концепції сучасних дослідників економіки праці, розглянуто питання інвестицій і структури людського капіталу, представлено модифікації рівняння заробітної плати Мінцера. Проаналізовано можливі моделі оцінювання людського капіталу в умовах кризи.

Ключові слова: людський капітал; норма віддачі; освіта; здоров'я; капітал культури; заробітна плата.

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Джамілія А. Сейтхожина
ОЦЕНКА ЧЕЛОВЕЧЕСКОГО КАПИТАЛА В УСЛОВИЯХ
ЭКОНОМИЧЕСКОГО КРИЗИСА

В статье обобщены концепции современных исследователей экономики труда, рассмотрены вопросы инвестиций и структуры человеческого капитала, представлены модификации уравнения заработной платы Минцера. Проанализированы возможные модели оценки человеческого капитала в условиях кризиса.

Ключевые слова: человеческий капитал; норма отдачи; образование; здоровье; капитал культуры; заработная плата.

Introduction. In the struggle for the leading position in production and business the driving factor is the availability of strong human capital. In this regard, the management of the company is aimed at the solution of strategic objectives: human recourses planning, individual capacities development, improvement of vocational competence, personnel explicit costs planning within the framework of a general strategy.

Most companies in the post-crisis environment are aimed at optimizing their activities, cost savings, reduction of the staff. Managers, leaving the most valuable employees, however, revise their salaries. Under the circumstances, the employees who quickly respond to new changes in demand for their human capital and market needs are in favor.

Latest research and publications analysis. Formally the theory of human capital appeared in 1962, when a series of articles devoted exclusively to this subject was first published in the University of Chicago journal "Political Economy" (The Journal of Political Economy, 1962). The merit of the nomination of the theory of human capital as an independent branch of economic analysis belongs to the Nobel Prize win-

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ner (1979) Th. Schulz. In the 1950s in search of the sources of productivity growth, he marked the unknown parameter, called originally "residual factor" as an independent factor. Subsequently, in the famous innovative works of this author "Capital Formation by Education" and "Investment in Human Capital" this "residual factor" was identified as acquiring and developing human abilities for labor (Schulz, 1960; 1961).

Human capital theory is based on the fact that some workers are more productive than the others, and this is due to the fact that they have better health, higher level of education or qualifications, which are considered as components of human capital.

In the 1970s the theory of human capital was amended by the model of reproduction of human capital during the life cycle – constant repetition, constant renewal of the production process of human capital. According to Y. Ben-Porath (1967), "There is a certain amount of time that must be at any given period allocated to activities that produce earnings and add to the stock of human capital". Th. Schulz (1960; 1961) and Y. Ben-Porath (1967) proposed the model of the human capital production:

$$Q_t = B_0(S_t \times K_t)^{B_1} \times D^{B_2}, \quad (1)$$

where Q_t – the amount of the work of human capital; t – a certain period of time; B_0 – coefficient of ability to increase the human capital; S_t – the part of an available stock of the human capital included in the production of this capital; K_t – the total stock of human capital; B_1, B_2 – ratio less than 1, $B_1 + B_2 < 1$; D – pay back investments (Ben-Porath, 1967).

A significant contribution to the development of human capital theory and the extension of its use was made by another American scientist G. Becker who was also awarded the Nobel Prize for the research in this area in economics in 1992.

G. Becker attributes to the main elements of human capital the following:

- the education capital (knowledge – the general and special);
- the preparation capital on production (qualifications, skills, work experience);
- health capital;
- the possession of an economically significant information (knowledge of the prices and incomes);
- migration capital (providing mobility of workers);
- the motivation of economic activity (Becker, 1993).

The most important ways of investment in human capital are education (increasing the value of human capital), health care (increasing the term of "life" of human capital), migration and information search (more efficient use of available human capital), having children (reproducing human capital in the next generation).

The above mentioned investments have both independent and combined influence on the efficiency of the labor activity of a person. For example, investing in the health of people, reducing the loss of working time in a person's life, thus increasing the efficiency of use of other types of investments (in education, training, job search etc.).

The ratio of the cost of human capital reproduction and the return of human capital consists of two aspects: "investment in education of a child – feedback from the working person" and "return from the working person – the maintenance of a person".

According to the theory of human capital labor productivity and respectively market costs of labor services (wages) are determined largely by how much an individual or a family and an employer feel the need to invest in education and training, health care and job placement (Marshall, 1984).

American experts in the field of economy of education L. Leslie and P. Brinkman based on analysis of data about the condition of U.S. higher education in the second half of the 1980s got the following results: investments in higher education by private parties, as a rule, completely pay off and bring tangible benefits; the coefficient of payback of private investments in training (profitability of education) for a bachelor's degree is from 11.8% to 13.4%, for a one-year postgraduate level – 8%, for a Master – 7.2%, for a PhD – 6.6% (Leslie and Brinkman, 1988).

It should be noted that taking into account only the monetary returns of schooling lowers its real value both for the employee and for the whole society. Higher education has a number of additional benefits of non-cash nature: independence at decision-making, creativity existence, less monotonous work, its best conditions, great opportunities to communicate, a more significant social status, etc. Taking into account all these non-monetary benefits related to getting higher education characterizes the integral value of higher education.

Benefits of non-cash nature form for individual additional items which some researchers include into the human capital. The concept of modern scientists, as noted in the work of A.B. Maydyrova represent an extended treatment category of "human capital", which is supplemented in their vision by the new elements sometimes generalized under the term "capital of culture" (Maydyrova, 2004).

According to A.I. Dobrynina, S.A. Dyatlova and others, the concept of "human capital" includes a creative activity, consciousness, physical, intellectual and other abilities of people, i.e. all their essential powers (Dobrynin et al., 1993).

Y.A. Korchagin includes into the human capital traditions (mentality), the culture of the general population, labor (its quality), education, professionalism, entrepreneurial ability, level of management, health (including the health system), the degree of freedom of labor movement. Y.A. Korchagin says: "Human capital is everything that is related directly to the person in the economy and his opportunities to demonstrate his abilities, including creative, business and administrative ones, while the basis of human capital is a deep culture of the nation" (Korchagin, 2000).

V.I. Martsinkevich and L. Thourou include into the human capital not only powerful but also social, psychological, world outlook, and cultural characteristics of people. For example, the ability to behave at home and at work, the ability to start dating, establish and maintain business contacts and relationships, the ability to maintain discipline, organization and order and stability in the family and society, the preferences and interests of people of non-economic character, philosophical, moral and ethical qualities (Martsinkevich and Sobolev, 1995; Thourou, 1970).

V.I. Martsinkevich writes: "The specifics of the current situation, and further more near term outlook, consists in that that humanitarian, personal qualities of an individual such as honesty, teamwork and communication skills, conscience, compassion, etc. have become necessary and productive in the national economy and the economic sphere " (Martsinkevich and Sobolev, 1995).

B.D. Breev and N.N. Pilipenko include into the human capital innate abilities: "Under the human capital is understood a special kind of capital – innate abilities of a person and acquired knowledge and skills that enhance the productivity of their labor and are a source of income" (Breev and Pilipenko, 1999).

One of the key micro-economic challenges facing the concept of human capital – assessment of the impact on the amount of current income (wages) by various forms of human capital: the duration of training, general professional experience and so-called specific human capital – the duration of labour for a particular firm.

The solution to this problem is based on different versions of the wage equation modifications of J. Mincer in 1958 (Mincer, 1974):

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN + \beta_5 \times TEN^2 + e, \quad (2)$$

where β – coefficient characterizing the rate of return, so that the coefficient of the variable *SCH* provides an assessment rate of return on investments in education, the variable *EXP* – a potential labor market experience (calculated on a notional formula $EXP = \text{age} - SCH - 6$ years (preschool age); *TEN* – specific capital accumulated in the enterprise; *W* – wage on the main job (or comprehensive income).

Coefficients $\beta_0, \beta_1, \beta_2, \beta_4$ have the sign "plus"; β_3 – "minus" sign.

The distinguishing feature of empirical studies based on this model – the use of microdata, reflecting the individual characteristics of health, education, work experience, qualifications. In the standard model of J. Mincer, the characteristics of such a substantial form of human capital as *health* were not taken into consideration. Meanwhile its worsening significantly reduces the efficiency and intensity of the "functioning" of the other forms of human capital, first of all – the educational capital.

Russian scientists M.B. Denisenko and A.A. Sagradov supplemented J. Mincer's equation by a new variable equation and the equation was as follows:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN + \beta_5 \times TEN^2 + \beta_6 \times LMNP, \quad (3)$$

where *LMNP* – self-assessment of health problems existence for the past month measured by the corresponding percentage of the total number of groups (Denisenko and Sagradov, 2000).

Unresolved issues. The wage equation by J. Mincer acknowledged as a traditional assessment of the economic profitability of investments into the human capital is necessary to supplement by elements arising in the development process of production relations in the post-crisis economy.

The research object is the wage equation by J. Mincer.

The aim of the research. On the basis of the analysis of expanded treatments of the category "human capital" to present modifications of wage equation by J. Mincer.

The methods of the research are systematic and comparative analysis of the scientific literature, as well as the method of deduction.

Key research findings. The equation must be supplemented by a variable *CUL*, representing the rate of return from those elements of the "culture capital", which are measured in monetary terms. Then the equation will be the following:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN + \beta_5 \times TEN^2 + \beta_6 \times LMNP + \beta_7 \times CUL + \beta_8 \times CUL^2 + e. \quad (4)$$

The rate of return from the "culture capital" can bring:

- the knowledge of foreign languages for which wages are paid additionally;
- an entrepreneurial capacity (when piecework pay a percentage from sales);
- the management level (position in the job hierarchy);
- an individual's ability to work in several places, have several sources of income (such as dividends from investments in securities, rent etc.).

Reduction of the personnel doesn't involve the refusal of the company management to invest in the company workers' human capital. In the given conditions the elements of human capital allowing the company to reach its goals will be estimated. For example, the analytical skills of an experienced hedger at the stock exchange, successful anti-crisis strategies of a finance director, creative thinking of an expert in marketing, allowing the company to become a leader in sales etc. The above mentioned can be attributed to the "culture capital" *CUL*.

At present, the majority of firms is aimed at costs saving, and keeping the workplaces reconsiders salaries. The management of the company can exclude some "bonus" items: such as position in the official hierarchy, qualifications, work experience, the knowledge of a foreign language and others. For example, the owner of a private company doesn't dismiss a highly-qualified experienced specialist in case of mass unemployment but reduces his salary. The wage equation by J. Mincer is the following:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 - \beta_4 \times TEN - \beta_5 \times TEN^2 + \beta_6 \times LMNP + \beta_7 \times CUL - \beta_8 \times CUL^2 \pm e. \quad (5)$$

It is shown in the model that an employer trying to save costs during the crisis doesn't take into consideration *TEN* – an employee's specific capital gained at the company (work position, qualifications, work experience) also he does not consider some elements of culture capital (e.g. the knowledge of a foreign language for which before a crisis accrued premium). Only that element of the culture capital is considered that helps the company work effectively even during a crisis. In this case, de jure equation will be the following:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN - \beta_5 \times TEN^2 + \beta_6 \times LMNP - \beta_7 \times CUL - \beta_8 \times CUL^2 \pm e. \quad (6)$$

Thus, an employer paying for qualitative characteristics of an employee owing to which he was kept in the company (they are not formalizable and quantificated – S.J) considers one *TEN* element – e.g. work experience. Though, a manager is more interested in analytical abilities of the worker in practice.

There will be several modifications of the equation during a crisis and post-crisis economy depending on a financial condition of a company and the value of a worker:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN + \beta_5 \times TEN^2 + \beta_6 \times LMNP - \beta_7 \times CUL - \beta_8 \times CUL^2 \pm e. \quad (7)$$

or:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN + \beta_5 \times TEN^2 + \beta_6 \times LMNP + \beta_7 \times CUL - \beta_8 \times CUL^2 \pm e. \quad (8)$$

or:

$$\ln W = \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN - \beta_5 \times TEN^2 - \beta_6 \times LMNP - \beta_7 \times CUL - \beta_8 \times CUL^2 \pm e. \quad (9)$$

$$\begin{aligned} \text{or:} \quad \ln W &= \beta_0 + \beta_1 \times SCH + \beta_2 \times EXP + \beta_3 \times EXP^2 + \beta_4 \times TEN - \\ \text{etc.} \quad & - \beta_5 \times TEN^2 - \beta_6 \times LMNP + \beta_7 \times CUL + \beta_8 \times CUL^2 \pm e \end{aligned} \quad (10)$$

Conclusions:

1. Human capital is integral and inalienable from an individual set of assets gained by it during a definite period of time and embodied in production due to its own motivation for economic activity. The elements of human capital are the biological capital, education, entrepreneurial skills, which include a social mobility, and strategic thinking, and other assets (social, psychological, philosophical, and cultural properties of a person). Under the social mobility we understood the particular stock of economically meaningful information about prices and incomes, which also requires expenses or money or time, but thus promotes growth of the efficiency of use of the human capital and respectively to the growth of revenue.

2. J. Mincer's wage equation recognized as a traditional assessment of investment profitability into the human capital will change in the course of further development of production relations and under the influence of the crisis phenomena. It will be a new modification in each discrete case.

3. Studying the issues of human capital investments, its structure and evaluation will be of considerable interest for the economic theory and practice. Reduction of all kinds of resources and competition growth, the accelerated development of the human capital becomes a strategic goal of most countries during a crisis.

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