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Measuring human capital

Human capital surveys and research in the Polish official statistics - current state and the future work

Note by the Central Statistical Office of Poland

Summary

The paper gives an overview of surveys and studies related to human capital in the Polish official statistics. The approach is inter-disciplinary, attempting to cover the different aspects of creation, maintenance and use of human capital. The surveys on human capital focus on three aspects: revenues and incomes, expenditure, and qualitative characteristics. Selected variables on human capital published by the Central Statistical Office of Poland and the data sources used are provided in the Annex.

I. Human capital surveys concept

1. The key concerns of human capital surveys in the Central Statistical Office (CSO) of Poland are identification of the current state of human capital. That is the reason of treating this approach as an interdisciplinary study that should cover all aspects of its creation, maintenance and utilisation. It would not be feasible to identify all of them, so the focus is put on the variables that could prove valuable during further investigations and can be acquired from other statistical and administrative sources.

2. In that manner human capital is defined as a set of attributes that have value, which can be increased via appropriate investments. These attributes are closely linked with individuals and cannot be separated from them. It is necessary to emphasize that interconnections between individuals are not covered by this approach due to the fact that they should be treated as social capital.

3. The most common human capital attributes are educational attainment, qualifications, skills and health. It causes the need for building a system of various linked studies rather than an isolated one. Such a system should specifically include proper tools, like data comparability mechanism, which would enable defining core variables by integrating data from various sources to produce reliable and valuable information.

4. Combining various data with educational level as a crucial variable allows to investigate human capital across the populations, which in turn reveals differences between inhabitants of rural and urban areas, younger and older people, total time of labour market activities related to lifelong learning and others. To this end, it is necessary to collaborate with statisticians and other scientific workers.

5. Surveys on human capital in the CSO in Poland are based on three basic approaches focused specifically on:

- (a) Revenues and incomes;
- (b) Expenses;
- (c) Qualitative characteristics.

6. The first one focuses on labour market indicators that measure people's income in connection with the educational attainment and qualifications they acquired or money spent on education related to the income level of a household. The second approach was developed in areas such as health, labour market and science, where indicators consist of the expenditures on healthcare, training, and research and development (R&D). The last one measures the characteristics of human capital based on its qualification, potential, creativity and others. The overall needs related to human capital research and measuring are concentrated on the outcome of education, which advocates the third area of statistical surveys.

7. In the effort to broaden the context of human capital statistical surveys data come from various statistical areas, which can be treated as input parameters for measuring different human capital attributes. Those variables are divided into six distinct groups: demography, health, labour market, education, culture, science, technology and innovation. Selected variables that are published by the CSO of Poland in human capital reports are presented in the table 1 (see Annex). They are compiled from various sources, both primary from the CSO of Poland and secondary which include administrative sources such as Social Insurance Institution (the list of actual sources are shown in the table 2 of the Annex).

8. Our experience in measuring human capital allows us to put forward the following conclusions:

(a) Many scientific concepts use various data taken from the official statistics. The approach of the CSO of Poland puts together almost all measures in the set of indicators fostering further research. Scientific elaborations can be grouped as follows:

- (i) Benefits from investments in human capital (Becker, Mincer)¹;
- (ii) Investments in higher education (Murphy, Welch)²;
- (iii) School enrolment (Schultz)³;
- (iv) Labour market activities, national human wealth (Jorgenson, Fraumeni)⁴; and
- (v) Others such as health or cultural capital.

(b) The key concern for human capital measurement is combining research areas, e.g. presented in the point (a) above, with basic variables of educational attainment. This enables studying various human capital states with the ability of identifying attributes that are outcomes on education;

(c) Assumption held in the CSO of Poland states that human capital can be treated as attributes referring to individuals. Social relations and cohesion are not included. This leads to the fundamental statement that human and social capital are distinct areas of interest but both are the parts of the concept of intellectual capital. Such clear separation helps making decisions while designing surveys, i.e. social coherency survey conducted in Poland is incorporated in the social capital research and not in the human capital.

II. Limitations of the current state of research

A. Interdisciplinary nature

9. Interdisciplinary nature of the human capital studies requires utilisation of data from various sources and collected by using different methods. Such characteristics require careful assessment and subsequent building of a harmonisation procedure leading to the uniform methodology.

B. Variety of needs at regional level

10. The need for statistical data concerning human capital has come from the central government and local municipalities. Many surveys, which are the source for human capital measurement, use sampling method eliminating the lowest level of the Nomenclature of Territorial Units for Statistics (NUTS) from inclusion in the studies. For example, the Labour Force Survey (LFS) in Poland similar to other European Union (EU) countries is a

¹ Becker G. S., Investment in Human Capital - A Theoretical Analysis, *The Journal of Political Economy*, vol. 70 (1962), no. 5.; Mincer J., Investment in Human Capital and Personal Income Distribution, *Journal of Political Economy*, vol. 66 (1958), no. 4.

² Murphy K.M., Welch F., Wage premiums for college graduates: Recent growth and possible explanations, *Educational Researcher*, vol. 18 (1989), no. 4.

³ Schultz T.W., Capital Formation by Education, *The Journal of Political Economy*, vol. 68 (1960), no. 6.

⁴ Jorgenson D.W, Fraumeni B.M., The Output of the Education Sector, Harvard Institute of Economic Research, Working Papers 1543 (1991).

quarterly sample survey of about 54700 households. It does not allow using these data with a drill-down analysis that presents the state of human capital on NUTS4 or NUTS3 level and in some cases even on NUTS2 level. Although this problem is well known (sample surveys are not supposed to show data for NUTS4 but for counties or the whole country), it is difficult to obtain data on different aspects of lifelong learning and its relation to labour market from surveys concerning full population.

C. Non-statistical research on human capital

11. The official statistical surveys are often compared and utilized by non-statistical research reports sponsored by businesses and municipalities. They are built on individually developed methodologies, which in many cases do not allow comparative surveys or studies. The differences lay in defining and sampling population as well as using terms and concepts. This may lead to a disrupted view of the state of human capital and the places that foster its development.

D. Composite indicators

12. Some information needs to be presented by composite indicators that include multidimensional measures consisting of different areas of human capital, which were mentioned above, such as: demography, health, labour market, education, culture, science, technology and innovation. The main difficulty in constructing a composite indicator is assessment of the importance of the human capital components.

E. Data comparability

13. One of the key issues to consider is comparability of data in time series, which is common to all national statistical offices. Attempt to present data in time series bears some serious obstacles. The harmonisation process of international institutions requires implementation of revised nomenclatures and classifications that disturb the structured data. Additional encumbrance lies in various profiles in which the statistical tables of the human capital data are presented. This requires showing more detailed data than would be common in standard indicators. As a result, the time series cannot be presented in an easy, accessible, traditional way.

III. Future work

14. State of the studies on human capital and its characteristics requires further work in the CSO of Poland which is briefly outlined below.

15. Much effort should be put into the methodology of harmonisation process including unification of terms and concepts of human capital survey in statistical and non-statistical areas such as intellectual capital.

16. The urgent needs for data on human capital status could be fulfilled by using the existing highly efficient surveys, like LFS, through ad-hoc modules. This would enable to extend the dimensions of studying human capital without the necessity of creating new surveys.

17. Identifying new areas of the human capital research which includes data based on sources such as the Programme for International Student Assessment (PISA) or the

Programme for International Assessment of Adult Competencies (PIAAC). The list of exemplary variables is presented in table 3 in the Annex.

18. In the vital area of new research is the measure of labour market mismatch. During the last 20 years the number of students in the higher education institutions has increased nearly five-fold from 403 thousand in 1990 to 1.9 million in 2009. Additionally, gross enrolment rate has also risen from 11.9% in 1990 to 53.7% in 2009. This could bring forward unbalance to the market and the official statistics should measure such phenomena and present it to the public.

19. Practical skills and qualifications of human capital is another area of new research to be developed. One of the most valuable sources of data in this area is Adult Education Survey conducted every 5 years. Some indicators from lifelong learning are included in LFS which can be presented annually or even quarterly.

20. Effort should be put into the research of human capital in selected populations, such as the disabled persons or inhabitants of rural areas.

Annex

Table 1
Selected variables used to measure human capital in different areas^a

<i>Group</i>	<i>Variables</i>	<i>Type^b</i>
Demography	– Population	– Q
	– Migration (internal migration, population inflow and outflow for permanent residence)	– Q
	– Female fertility, reproduction rates, live births and natural increase of population	– Q
Health	– Persons by self-perceived health, limitation of daily activity, suffering from long-standing health problems	– Q
	– Medical staff, medical personnel entitled to practice medical profession, grade II doctors specialists	– Q
	– Beds in general hospitals and the out-patient health care	– Q
	– Occupational diseases and health care	– Q
	– Persons with mental disorders, alcohol and other substance addictions	– Q
	– Budget expenditure on health care	– E
Education	– Access to pre-primary education	– Q
	– Net enrolment rate at different education level schools	– Q
	– Students, graduates, students of postgraduate studies and students of doctoral studies (fields of study)	– Q
	– Ratio of pupils to teachers	– Q
	– Average number of pupils per unit at different education level schools	– Q
	– Population by educational level	– Q
	– Structure of upper secondary schools students by type of school and type of the programme (vocational, general)	– Q
	– Results of school leaving exams	– Q
	– Expenditures on education (% of GDP, % and Polish zloty of households income)	– E
Labour market	– Employed persons	– Q
	– Employment rate (including disabled persons)	– Q
	– Rate of self-employed persons	– Q
	– Absence rate from work	– Q
	– Activity rate (place of residence)	– Q
	– Economically inactive persons (reasons of inactivity including discouraged people)	– Q
	– Unemployed persons, unemployment rate	– Q
	– Registered unemployed persons (duration of unemployment)	– Q
	– Average monthly gross wages and salaries of employees	– R, E
Culture	– Residents per library (including branches)	– Q
	– Public library borrowers and loans per borrower	– Q
	– Specialist libraries and cultural institutions by type	– Q
	– Selected classes and courses with participants in cultural institutions	– Q
Science, innovation	– Expenditures on innovation activity in industry and on R&D	– E
	– Employment in R&D activity (educational level,	– Q

<i>Group</i>	<i>Variables</i>	<i>Type^b</i>
and technology	occupational groups)	
	– Access to the internet in households	– Q
	– The internet private users (purpose, professional status)	– Q
	– The internet users performing selected operations (purpose, professional status)	– Q
	– Protection of intellectual property	– Q

^a If possible, data are presented according to the following breakdown: rural, urban, sex, educational level and age groups - including pre-working, working, mobility, non-mobility and post-working age.

^b R = revenues and incomes, E = expenses, Q = qualitative characteristics.

Table 2
List of sources

<i>Type</i>	<i>List of sources</i>
Primary (from Central Statistical Office)	LFS – Labour Force Survey EU-SILC – European Union Statistics on Income and Living Conditions ICT (IIS) – Information and Communications Technology Surveys of libraries, culture centres and clubs activity (from Central Statistical Office) Surveys of medical activities and healthcare institutions (from Central Statistical Office) Surveys of innovation and Research and Development (from Central Statistical Office) Surveys of education (from Central Statistical Office) Surveys of labour market (from Central Statistical Office)
Secondary	Data from The Institute of Occupational Medicine Data from The Institute of Psychiatry and Neurology Data from Ministry of Health System of Educational Information Demographic data Data from The Central Examination Board Data from Social Insurance Institution

Table 3
Future work - list of example variables

Variables

The number of children that are eligible to receive funds from Ministry of Education
The structure of students based on their profiles
The results of the PISA survey
Non-formal education, which includes the individual courses for pupils
The number of hours that students spend learning
The number of foreign languages and number of hours that pupils devote to learning them
Total cost of receiving higher education diploma and opportunities it gives
The number of books (non-didactic and non-specialized literature) that people read every year
The number of hours spent on reading newspapers (weekly)
The average number of years that people will live at the time of being born
The satisfaction of current working place and job
Education-to-labour market mismatch
