THE PROCESSES LINKED WITH THE CREATION AND DEPRIVATION OF HUMAN CAPITAL WITHIN THE CONTEXT OF SOCIAL INCLUSION

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Abstract:

According to OECD, human capital is defined as productive wealth embodied in labour, skills and knowledge. Based on this definition, the focus of many analyses is often narrowed down to maximalising the utility and effectiveness of the usage of human capital in the business environment. If our society is however to truly become an economy based on information and knowledge, we should also keep in mind the deprivation of human capital that influences individuals and/or parts of population in an economy, thus resulting into wasted potential. This paper deals with modeling the processes of deprivation of human capital through regression analysis, taking into account living conditions and factors of social exclusion.

Keywords: Human capital, Deprivation, Poverty, Regression

JEL: J24, I32, C32

Introduction

Human capital is often considered as one of the key factors when it comes to building knowledge based society (SAV, 2008). Many papers deal with the creation of human capital (Cohen & Soto, 2007) and there is also research on how do investments into human capital impact the poverty of individuals (McKee & Todd, 2011). Our goal is however to study the reversed process – how does poverty affect the human capital. Even though similar studies have been conducted (Currie, 2009) suggesting intergenerational transition of economic status and human capital potential of individuals. In this paper we will focus on the unused (or wasted) human capital and the negative effects of such a process on a society.

1   Data and methods

In order to be able to use quantitative methods, we have to determine our pool of potential explanatory variables, as well as select a dependent variable that will represent the deprivation of human capital and its effect on the society. For this purpose we will use the indicators of

Social inclusion from the Sustainable Development Strategy of EU (Eurostat, 2009). This system of indicators possesses a certain hierarchy, illustrated in Fig.1.

Fig 1: Hierarchy of the area indicators of social inclusion within the Sustainable Development Strategy

Headline indicator	Operational objectives and targets Actions/explanatory variables	Operational objectives and targets Actions/explanatory variables
Population at-risk-of-poverty or exclusion	*Monetary poverty and living conditions*	
	Persons at-risk-of-poverty after social transfers	Persistent-at-risk-of-poverty rate
		Persons at-risk-of-poverty after social transfers, by gender
		At-risk-of-poverty rate, by age group
		At-risk-of-poverty rate, by household type
	Severely materially deprived persons	Relative median at-risk-of-poverty gap
		Inequality of income distribution
	Access to labour market	
	Persons living in households with very low work intensity	In work at-risk-of-poverty rate
		Total long-term unemployment rate
		Gender pay gap in unadjusted form
	Education	
	Early leavers from education and training	At-risk-of-poverty rate, by highest level of education attained
		Persons with low educational attainment, by age group
		Life-long learning
		Low reading literacy performance of pupils
		Individuals' level of computer skills
		Individuals' level of internet skills
Contextual indicator	Public expenditure on education (for sub-theme Education)	

Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators

We will however ignore it in our analysis. We have selected *At-risk-of-poverty rate, by highest level of education attained* as our headlining indicator (level of education 3c defined by the ISCED standard). We assume that a person with low educational attainment living below the poverty line was not able to achieve his full human capital potential and his living conditions impair his abilities and possibilities to improve his situation.

As for potential explanatory variables we will use all of the available indicators on second and third level. The reason for not including the headlining indicator is its composition as it is an aggregation of three of the second level indicators (except *Early leavers from education and training*).

We are going to use country specific values from years 2005 – 2009. This is the longest time window for which all the values for all EU 27 countries are available [6]. We will use all of the four indicators on the second level as well as the headlining indicators. We

will treat values of all indicators for one country for a specific year as one observation. Such aggregation is substantiated by the fact that we are interested in the relations of the changes in the indicators reflected in factors and these changes happen both over the time as well as over the geographic dimension. We will use the same aggregation for data for all of the included methods. The used aggregation of data doesn't allow testing for cointegration (Engle & Granger, 1987). Some indicators offer different variants; we chose the variants that represent the most vulnerable population groups. The chosen variants of the corresponding indicators are listed in the Tab. 1.

Tab. 1: Variants of chosen indicators

Indicator	Variant
Persons at-risk-of-poverty after social transfers, by gender	Female population
At-risk-of-poverty rate, by age group	Aged 65 and above
At-risk-of-poverty rate, by household type	Single female
Persons with low educational attainment, by age group	25 – 64 years
Individuals' level of computer skills	Lowest level
Individuals' level of internet skills	Lowest level

Source: Author

In order to model the relationship of the dependent variable and its explanatory variables we will use a linear regression model.

2   Results of regression analysis

The result of our analysis is a regression model containing six explanatory variables from the aforementioned area of indicators and a time variable t that will despite the aggregation of data keep track of what year the observations come from and in a way supplement time dimension. The characteristics of statistically significant explanatory variables are presented in Tab. 2 along with the abbreviations we are going to use for them when writing down the model equation.

Tab. 2: Characteristics of statistically significant explanatory variables in the linear regression model of *At-risk-of-poverty rate, by highest level of education attained*.

Variable	Estimate	Standard Error	T- Statistic	P-Value	Abbreviation

|					
Constant	-1640,58	564,062	-2,9085	0,0043	-
Severely materially deprived people	0,198966	0,0338661	5,87508	0,0000	MDE
People at-risk-of-poverty, after social transfers	0,908856	0,121344	7,48994	0,0000	PST
Inequality of income distribution	-0,754334	0,112106	-6,72876	0,0000	II
At-risk-of-poverty rate, by age group	0,282968	0,0386205	7,3269	0,0000	AR
Gender pay gap in unadjusted form	0,19122	0,0455033	4,20234	0,0001	GP
Public expenditure on education	-0,609908	0,117468	-5,19214	0,0000	E
T	0,820045	0,281004	2,91827	0,0042	-

Source: Author

The adjusted R-squared statistic, more suiTab. for comparing models with different numbers of independent variables, is 82,3084%. The value of Durbin Watson Statistics is 1.70216 with a P-value of 0.0436 which rules out autocorrelation of residuals within the model. Tab. 3 illustrates the results of testing for normality of residuals, as we can see the residuals come from a normal distribution. The P-value of Kolmogorov-Smirnov Test is 0,848587. The histogram of the residuals is shown in Fig. 2.

Tab. 3: Testing for normality of residuals of the linear regression model of *At-risk-of-poverty rate, by highest level of education attained*

Test	**Statistic**	**P-Value**
Chi-Squared	24,2727	0,446094
Shapiro-Wilk W	0,982693	0,608044
Skewness Z-score	1,04996	0,293737
Kurtosis Z-score	1,95287	0,0508353

Source: Author

Fig. 3: Histogram of residuals of the linear regression model of *At-risk-of-poverty rate, by highest level of education attained*
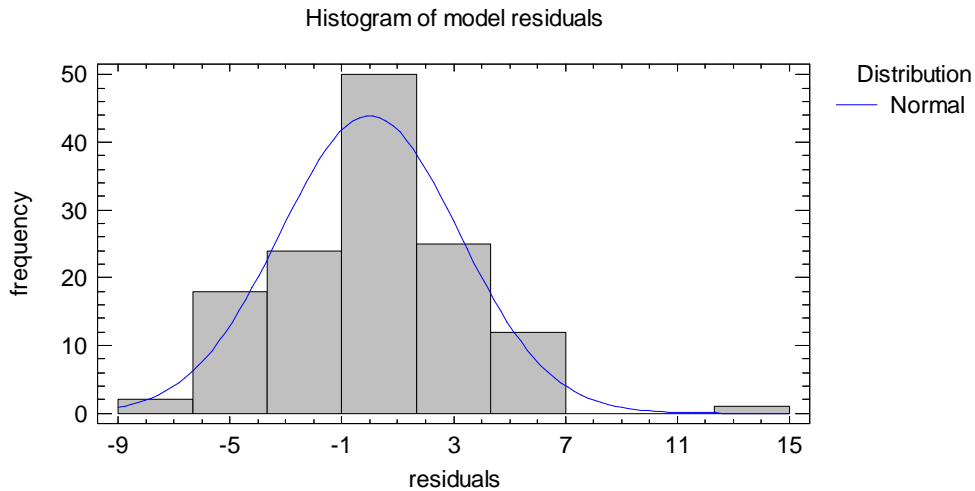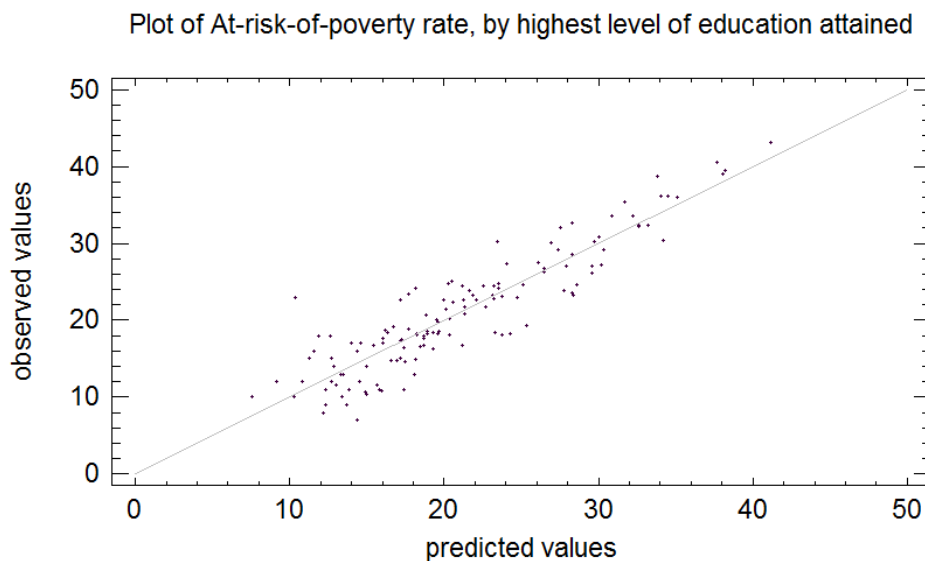

Source: Author

The model doesn't involve Heteroscedasticity or serious multicollinearity. It's equation is as follows:

$$\textit{At-risk-of-poverty rate, by highest level of education attained} = -1640.58 + 0.198966* \textit{MDE} + 0.908856* \textit{PST} - 0.754334* \textit{II} \quad (1)$$
$$+ 0.282968* \textit{AR} + 0.19122* \textit{GP} - 0.609908* \textit{E} + 0.820045*t$$

Let us look at the interpretation of the model – An increase in the materially deprived population and people living below the poverty line is more likely to cause people not to attain higher education as people coming from poorer background have to start working earlier as well as have a lower motivation to study further. With an overall increase in income inequality of a society we can also expect more people to fall below the poverty line and experience the process we just described. The increase in elderly people living below poverty line could be a result of lower income throghout their lives and would indicate a past increase of families with lower incomes which we consider a limiting factor that transits to the younger generation coming from such families thus limiting their possibilities of using their potential of human capital. The negative regression coefficient of *Public expenditure on education* indicates that as the spendings on education increase, the opportunities at educational

achievement and and accumulation of human capital are more accessible to a wider part of the population. The dependency with *Gender pay gap in unadjusted form* reflects the influence of gender inequality on the deprivation of human capital. Observed versus predicted model values are illustrated in Fig. 3.

Fig. 3: Observed and predicted values of the linear regression model of *At-risk-of-poverty rate, by highest level of education attained*

Source: Author

3   Latest development of the variables involved in the model

In this chapter we will look at the development of the indicators involved in the model based on (Eurostat, 2009).

As for the *People at-risk-of-poverty, after social transfers*, the aggregated risk of poverty for EU27 countries has experienced very little to no changes since 2005. The population groups with the biggest risk of experiencing poverty were people below 25 or above 64 years of age. The risk of poverty is also dependent on educational attainment with people with educational attainment 3c or below having the highest risk of experiencing poverty. As we can notice the Eurostat report reflects the relations included in our model and factors that have a statistically significant relationship to human capital deprivation posses the same relationship to risk of poverty. In Slovakia and Czech Republic the decline of values of the *People at-risk-of-poverty, after social transfers* has been more noticeable (as well as positive) than in the aggregate EU 27 values.

The *Inequality of income distribution* indicator has remained more or less unchanged throughout the years 2005-2009 for EU 27, Slovakia and Czech republic.

The *Gender pay gap in unadjusted form* has again had a neglectable development for the EU 27 aggregate, however it has had a positive development in Czech and Slovak Republic with a noticeable increase due the ongoing economical crisis in 2008 for Czech and in 2009 for Slovak Republic.

Again the changes of *Public expenditure on education* can be considered unremarkable, however we must keep in mind, that this indicator is calculatted as percentage of GDP which in 2009 experienced a decrease in EU 27, Czech and Slovak Republic.

As for the dependent variable - *At-risk-of-poverty rate, by highest level of education attained*, there were little to no changes in the EU 27 values, a mild oscillation for Czech Republic and increase for Slovak Republic.

Based on the development described in this chapter, we could say, that the deprivation of human capital and its causes has been more or less neglected throughout the EU 27 as well as in Czech and Slovak Republic. While on one hand it is understandable that during the current economical environment all over the world there are often other priorities governments tend to focus on, if we let social exclusion unnoticed, we both businesses and governments could in the end suffer from negative externalities it can create thus resulting in further deprivation of human capital.

Conclusion

Based on our model, we can say, that a noticeable part of wasted human capital has its causes in poverty and material deprivation. If an economy as a whole is to be competitive, its goal should also involve using this wasted potential. For that to happen we need to face obstacles linked with social exclusion. While it is debaTab. to which extent should a higher authority (government, municipality, etc.) be involved in solving these problems. The current political system in both Slovakia and Czech Republic is set in a way that expects policymakers to deal with these issues. Policymakers should thus be aware, that while developing human capital means improving the quality of education and training an important part in maximalising human capital is creating a society with equal opportunities, where the economical background of a person doesn't prevent him from achieving his full human capital potential. Our model suggests that increasing public expenditure on education is one of the

possible stimulants of reducing the waste of human capital; however such spending should be effectively directed as just a blind increase in spending doesn't necessarily solve this problem.

Other possible measure is combatting poverty and material deprivation or at least allowing individuals coming from such backgrounds to attain higher levels of education. Again such supporting systems (like the ones already in use) have a potential of being abused.

Our goal was to focus on the processes linked with the deprivation of human capital and explore the causation of such a process. We have shown that there is more or less no development for the area of deprivation of human capital and while issues related to poverty are often on the agenda of the EU (year 2010 was The European Year of Combatting Poverty and Social Exclusion) often in multiple strategies (besides Sustainable Development Strategy, Social inclusion indicators and targets are also a part of Europe 2020 strategy), effective policies for this areas are yet to be implemented.

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