Labor Market Outcomes in Georgia: The Effect of Education on the Probability of Participating in the Labor Force, Being Employed and Getting High Returns

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This research studies labor market outcomes in Georgia. The study concentrates on the effects of education on participation in the labor force, employment and salary level based on the Integrated Household Survey of Georgia for 2004-2009. Dprobit and OLS regression models are used for estimation. The key research findings are that education levels have a significant effect on the probability of an individual's participation in the labor force and being hired. However, the returns on education and on potential experience are low. In addition to education level, gender and the region where an individual lives play an important role in determining labor market outcomes and returns on education.

Introduction

Georgia is still in the process of transition. Even though the economy has been growing (on average 5.6%) during the last five years, the country still faces a high unemployment rate (14.6% in 2013). Hence, unemployment still remains one of the most serious socio-economic problems.

A question addressed by many scholars while working on employment/ unemployment issues, is the education level of the labor force in the country of research interest. The higher the education level is, the higher the probability of employment should be. This should motivate the labor force to advance productive capacities and to participate in the labor market.

This research studies labor market outcomes in Georgia during the period of 2004-2009. It relies on the human capital theory and studies the effects of education on the labor force participation, employment and level of returns. The effects of family size, gender, marital status, health condition and the region where an individual lives are also taken into consideration.

This paper addresses the following research question: how does education affect the probability of an individual's participation in the labor force, being employed and earning high returns in Georgia? Based on the human capital theory and the country's specific characteristics, relevant hypotheses are derived and tested.

The research is based on the database generated from the Integrated Household Survey of Georgia. The National Statistics Office of Georgia conducted this survey. The data is cross sectional and covers the period of 2004- 2009.

Literature Review

The role of education in the labor market has been widely studied in the literature during the last several decades. The theoretical as well as the empirical literature suggests that education has a considerable role in the labor market outcomes.

Before the human investment revolution in economic thought(Bowmen, 1966), education was considered to be a consumption good and demand for it depended on tuition fees, preferences, income and the ability to study. However, human capital theory (Becker, 1964) considers education to be an investment good. The costs of education includes the expenditures on studies in terms of tuition fees and the opportunity cost in terms of forgone income, which individuals would earn if they worked instead of studied. The benefits of attaining education include gained knowledge, increased productivity, higher probability of being employed and earning a high income.

The estimation of the rate of return on education started in the early sixties. Two waves of scholars are distinguished in the literature for estimating the rate of returns on education. The first wave of scholars (Blaug, 1992) estimate the rate of return using the "elaborate type" method, which compares costs of attaining the education to its future benefits. The second wave of scholars (Blaug, 1992) studies the rate of returns on education by estimating the earnings equation, which is the function of years of schooling, potential experience and experience squared.

Schultz (1963) and Becker (1964) started the first wave of empirical studies in the literature (Blaug, 1992). They used the "elaborate type" method for estimation. This method compares benefits of attaining higher education to costs forgone for attaining it (Schultz, 1961; Becker, 1964). According to this method, an individual should invest in education if benefits from education exceeds or equals to the cumulated cost of investment in education (Becker, 1964).

To find out the returns on education, the earnings of individuals, who attained higher education, are compared to the earnings of individuals who did not attain it (Schultz's, 1963; Becker, 1964). The difference between them will indicate the size of returns on education. Besides

education, ability, place of living, social class, age, family size, gender and wealth of an individual may affect on earning. Therefore, in order to isolate the returns on education the earnings of the individuals with different level of education in ceteris paribus conditions should be compared.

The second wave of studies started with the work of Jacob Mincer, who (1974) introduced earning function, where earning depends on years of schooling, potential experience and potential experience squared. Including potential experience in the equation is based on the assumption that work experience may contribute to upgrading skills of an employed individual (Minser, 1974). Including experience squared in the equation imposes a restriction on human capital investment, meaning that 'the returns to on-the-job investments fall over working life, as the period over which they can be used becomes shorter' (Rosen, 1972).

To catch the effect of ability on returns to education, Griliches (1970) introduced interaction variable for schooling-ability in the model of earnings (Gronau, 2005). In this case the ability of an individual is controlled and the coefficient of education captures only the effect of education. Griliches' approach might solve the omitted variable bias problem, but finding a good proxy for ability is not always possible.

The rate of returns on education was estimated for various country cases in the literature. Cahuc and Zylberg in their book *Labor Economics* (2004) discuss the empirical results of the study of private returns on education in fifteen European countries during 1994-1995. The results report that one more year of schooling increases returns on education on average by 7.9% for women and 7.2% for men. The estimates differ within countries. For women education has the highest return in UK with a coefficient estimator of 11.8% and the lowest return in Sweden, with a coefficient estimator of 3.8%. Cahuc and Zylberg (2004) explain comparatively lower returns to education in Scandinavian countries by the existence of 'centralized collective bargaining', which negatively affects wages.

Bartolo (1999) studies returns on education in Canada, Italy and US. The model explains 23% of variations in earnings in case of US, 14% in case of Canada and 19% in case of Italy. The coefficient estimate for schooling varies from 4% to 7% in these countries, the coefficient of potential

experience is 3-4% and the coefficient estimate of experience squared is very small (0.1% – 0.07%) with a negative sign.

The comparative analysis of returns on education in Russia and Ukraine is also carried out (Gorodnichenko & Peter, 2004). As members of the former Soviet Union, they had a similar structure of wage, education system, labor force composition and returns to education before the collapse of Soviet Union (Gorodnichenko & Peter, 2004). The research is based on the Russian and Ukrainian Longitudinal Monitoring Surveys covering a period from 1985 to 2002. The authors estimate Mincer equation. The model includes years of schooling, potential experience, potential experience squared, as well as gender and capital a. In case of Russia the model explains 18% of the variation of earnings, while in case of Ukraine -13%.The coefficient estimate for returns on education in the case of Russia is 9.5% and in the case of Ukraine- 4.5% (Gorodnichenko & Peter, 2004). In both countries returns on potential experience is low compared to the evidence from other countries, the indicator equals 3% in the case of Russia and 1.9% in the case of Ukraine. The gender gap is high.Women earn 41% and 47% less compared to men in Ukraine and in Russia respectively. Earnings of the individuals, who live in capital appears to be higher in both countries compared to the individuals who live in the other regions (Gorodnichenko & Peter, 2004).

There is a lack of literature on the labor market outcomes and the rate of returns on education or potential experience for the case of Georgia as well as for the cases of other the former Soviet countries, which experienced the same structural reforms as Georgia did.

Data Description

The research is based on the database of the Integrated National Household Survey of Georgia. The data is cross-sectional and covers the period of 2004-2009.For research purposes the upper limit of age is set at 75, as in case of Georgia people usually do not retire when they reach retirement age.

Methodology

The following hypotheses are tested in the research:

1. individuals with higher education degree are more likely to participate in the labor force of Georgia;
2. individuals with more years of schooling are more likely to be hired at the labor market of Georgia;
3. individuals with higher education degree are less likely to be self-employed;
4. living in urban areas increases the probability to participate in the labor market and being hired;
5. returns on education and experience are low in Georgia. This hypothesis contradicts human capital theory.

The following equations are estimated:

$$P(part = 1|X) = \Phi(\beta_0 + \beta_1 P_1 + \beta_2 P_2 + \beta_3 H + \beta_4 B + \beta_5 M + \beta_6 PHD + \beta_7 px + \beta_8 X + \varepsilon)$$

(1) where part (labor force participation) is a binary variable, with the outcome 1 if an individual participates in the labor market and the outcome 0 if not. Φ is the cumulative function of the following standard normal variables:P_1– primary education, P_2 - secondary education, B-bachelor's degree, M- master's degree, PhD-academic degree, px-potential experience, with three categories: low, considerable and high and X is the vector of the dummy variables, including male, married, capital, urban, year, chronic disease and metric variable family size, potential experience in square.

$$P(hired = 1|X) = \Phi(\beta_0 + \beta_1 P_1 + \beta_2 P_2 + \beta_3 H + \beta_4 B + \beta_5 M + \beta_6 PHD + \beta_7 px + \beta_8 X + \varepsilon)$$

(2) where **hired** is a binary one, with outcome 1 if an individual is hired and outcome 0 if an individual is not. Φ is the cumulative function of the following standard normal variables: P1– primary professional degree, P2-secondary professional degree, H-high school, B -bachelor's degree, M-master's degree, PhD -academic degree, px - potential experience, and X is the vector of the dummy variables, including male, married, capital, urban, year, chronic disease and metric variables family size, potential experience squared.

$$P(Selfeml = 1|X) = \Phi(\beta_0 + \beta_1 P_1 + \beta_2 P_2 + \beta_3 H + \beta_4 B + \beta_5 M + \beta_6 PHD + \beta_7 px + \beta_8 X + \varepsilon) \quad (3)$$

where, dependent variable, self-employed, is a binary one, with outcome 1 if an individual is self-employed and outcome 0 if not. Φ is the cumulative function of : P1– primary professional degree,P2-secondary professional degree, *H* - high school, B- bachelor's degree, *M* - master's degree, PhD-academic degree, px- potential experience, and X is the vector of the dummy variables, including male, married, capital, urban, year, chronic disease and metric variables family size and potential experience in square.

The next step is to study individual returns on education in Georgia. In order to answer the question, the Mincer equation (4) is estimated for the case of Georgia:

$$E(Lnwagehired|X) = \beta_0 + \beta_1 S + \beta_2 X + \beta_3 X^2 (4) \text{ (Mincer,1974)}$$

where dependent variable is log of wage of hired individuals, as we wonder market returns on education. Log of wage is the function of S - the years of schooling, X - potential experience, which equals age– S- 6 and experience in square, which points that over time it has negative returns. Mincer equation is estimated by the ordinary least square regression (OLS). The hypothesis that the independent variables are jointly different from 0 is tested by the Wald test.

Resultsand Analyses

Labor market outcome

According to the criteria of the National Statistics Office of Georgia (Geostat), labor force participants are individuals '15 years old and above, who are working or are looking for a job and offer their labor for production of the services or products (Labor Force Statistics, 2009). Based on these criteria, the labor force participation rate in Georgia in 2009 is 66.3%, among them 16.9% of labor force participants are unemployed, 29.1% are hired, 54% are self-employed.

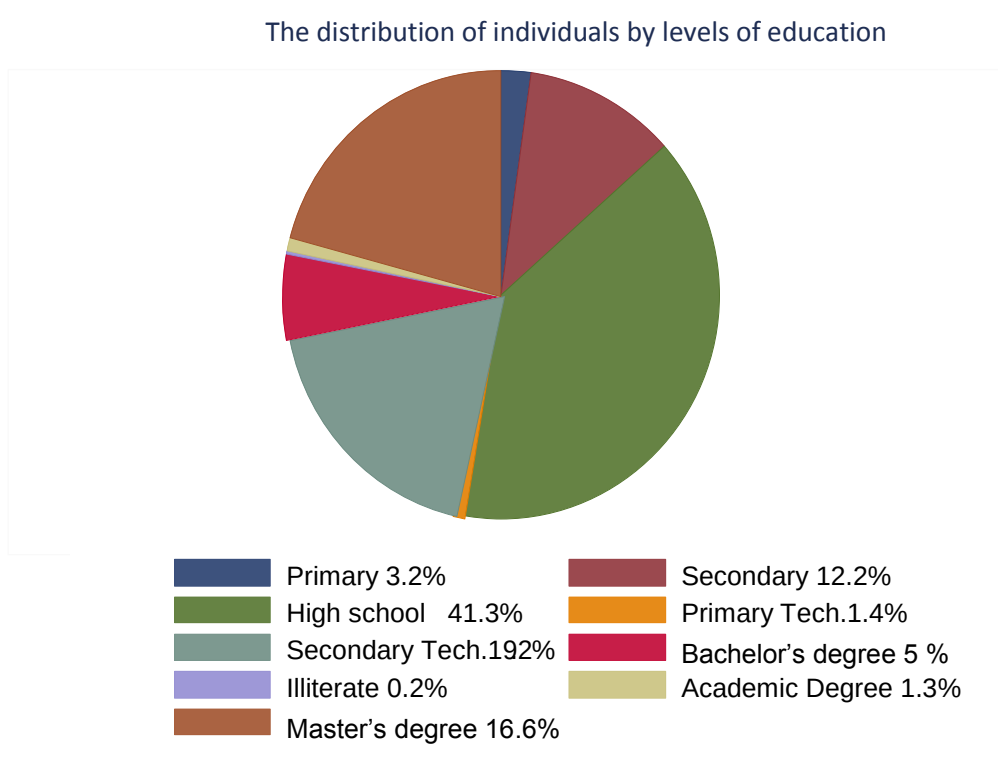
The country faces a high unemployment rate, but more alarming is the very high share of self-employed individuals among the labor force participants. The issue is that individuals in the self-employed category are either 'owners of the personal enterprises during the accounting period or individuals working for free in a family enterprise/holding' (Labor Force Statistics, 2009). The estimation shows that 72% of self-employed individuals do not generate any income. These are the individuals, who would like to get a regular job but because of a lack of job opportunities, they end up being self-employed in their own household or agriculture in and work for free. This means that even though these individuals are officially considered to be employed according to the Gestat (Labor Force Statistics), unofficially they are unemployed. Hence, the problem of unemployment is more severe in the country than official unemployment rate indicator shows.

Table 1: the distribution of economic activity of the labor force by regions

Region Employment	Kakheti	Tbilisi	Samcxe Javakheti	Adjara	Qvqartli	Shqartli	Guria	Mcxeta mtianeti	Samegrelo	Imereti
Unemployed	**6.8%**	**38.6%**	**2%**	**12.5%**	**6.4%**	**6.7%**	**1.%**	**2.3%**	**8.5%**	**15%**
Hired	**8%**	**40%**	**2.5%**	**8.7%**	**9%**	**5.2%**	**2.%**	**2.2%**	**7.3%**	**15%**
Self-employed	**12.9%**	**6.3%**	**7.8%**	**9.3%**	**11.8%**	**7.8%**	**5.%**	**2.2%**	**14%**	**22.2%**

Source: calculations are based on the data of Integrated Household Survey of Georgia, 2009

The more populated the region, the higher the unemployment rate is in this region. Most of the unemployed people are living in the capital (Tbilisi) of the country and in the regions of the West Georgia: Adjara, Samegrelo and Imereti. Most of those individuals who are hired are living in Tbilisi, Imereti and Kakheti. Other regions face a lack of job opportunities.



The illiteracy rate in Georgia is close to zero (0.2%), which means that almost everyone in the country is able to read and write. The individuals, whose maximum level of education is below a high school degree, represent 15.5% of the population. The share of individuals, whose maximum level of education is high school level represent 41%. The share of individuals, who obtained a primary professional, secondary professional or higher education degree, is almost 44%, which means that the overall education level in the country is high.

Knowing that the education level in the country is high, it is interesting to observe the share of unemployed, hired, self-employed and non-participants in the labor market.

Table 2: the distribution of education by economic status

	Participants in the labor force			Non participants
Employment / Education level	Unemployed	Hired	Self-employed	
High school	8%	10%	44.2%	37.8%
Primary professional	4.7%	10.7%	45.5%	39.1%
Secondary profess	11.5%	22.3%	39.7%	26.5%
Bachelor's degree	5.9%	24.5%	17.4%	52.2%
Master's degree	18%	44.4%	17.7%	19.9%
PHD	5.1%	15.1%	42.4%	37.4%

Source: Integrated Household Survey of Georgia, 2009

Among those, who completed high school or primary professional education, approximately 60% participate in the labor force and most of them are self-employed. The situation is different in the case of individuals with secondary professional education. They are mostly nurses, teachers for nursery school, primary school or music school,

mechanical engineers. The labor force participation rate in this group is high, but the majority of individuals with these degrees are self-employed. The participation rate in the group of individuals with Bachelor's degree is low. The reason for this may be negative expectations of individuals, that they can get a job even if they look for it. The participation rate is highest in the group of individuals with Master's degrees. The majority of individuals from this group are hired.

The results so far show, that in the groups with higher levels of education, the rate of participation in the labor market is higher as well. However, the group of individuals with PhDs deviates from this trend. In the group of individuals with PhDs, the nonparticipation rate is high as well as the rate of self-employment. The estimation shows that from this group among the individuals who are self-employed only 17% earn a salary. The explanation of this outcome may be that those individuals who are self-employed are working as private tutors and do not report their income. Unfortunately, the data does not give us the opportunity to study the reasons for such outcomes for PhD graduates in the country more deeply.

The estimation results of equation (1), equation (2) and equation (3)

In order to test the first hypothesis that the individuals with higher education degree are more likely to participate in the labor force, equation1 is estimated by the robust dprobit regression. This hypothesis, as well as hypothesis 2, that individuals with higher education degrees are more likely to be hired are based on the human capital theory, that education as an investment has positive effect on the labor force participation, labor market outcomes and wages an individual gets for work performed.

Table 3: the results of estimation equation (1), equation (2) and equation (3);

Variables	***Equation (1) Participation***	***Equation (2) Hired***	***Equation (3) Self- Employed***
High school	.088 ** (.002)	.056 ** (.003)	.068 ** (.003)
Primary professional	.084 ** (.006)	.122 ** (.010)	.043 ** (.009)
Secondary professional	**.163** ** (.002)	**.17**4 ** (.005)	.024 ** (.004)
Bachelor's degree	.084 ** (.004)	**.308** ** (.007)	**-.092** ** (.005)
Master's degree	**.263** ** (.001)	**.353** ** (.005)	**-.106** ** (.004)
PhD	.088 ** (.008)	**.131** ** (.012)	**.072** ** (.010)
Potential experience	**.193** ** (.001)	.067 * (.001)	.141 ** (.002)
Family size	-.044 ** (.001)	-.016 ** (.001)	-.038 ** (.001)
Male	**.171** ** (.001)	.039 ** (.001)	.080 ** (.002)

Married	.0006 (.003)	-.007 * (.001)	.064** (.003)
Urban	**-.220** ** (.002)	.075 ** (.001)	**-.357** ** (.002)
Capital (Tbilisi)	**-.077** ** (.003)	.015 ** (.002)	**-.196** ** (.003)
Chronic disease	**-.195** ** (.002)	-.063 ** (.001)	-.086 ** (.003)
Potential experience sq	-.008** (.0001)	-.005* * (.00008)	-.003** (.0001)
Year dummies	No	No	No
Wald chi2 (14)*	52160.04	36089.13	54358.54
Pseudo squared ***R***	0.2053	0.19	0.22
Log pseudo-likelihood	-124138.22	-89535.08	-129285.74
Observation	***244494***	***244494***	***244494***

*Notes: Robust standard errors in parentheses. * Significant at 5%;**significant at 1% .The reference categories are, primary education, female, not married, other regions of Georgia except Capital, individual without any of the chronic disease, low experience. He equation was estimated initially by including year dummies, but coefficients were insignificant. Than the year dummies were dropped and the estimation results reported on the table does not include the.*

The first column of Table3 reports the output of estimation of equation 1, the second column reports the estimation results of equation 2 and the third column reports the estimation results of equation 3. The number of observations is ***244494***. The model is statistically significant at 5% as well as at 1% level and it fits the data. All coefficients except marital status are significant at 5% as well as 1% level. Each level of education has positive effect on the predicted probability of individual participating in the labor force. The size of effect is highest in the case of secondary education, which increases predicted probability of individual participating in the labor force by 16% and in case of Master's degree, which increases a predicted probability of an individual participating in the labor force by 26%. The variables of different education levels are jointly significant, pointing out that education has a positive and significant effect on the probability of an individual participating in the labor force.

The coefficient of potential experience is also positive and significant. It shows that considerable potential experience increases the predicted probability of an individual participating in the labor force by 19%, but potential experience in square points that over time the effect becomes negative. This can be explained by the fact that the more experienced an individual has the higher the chance is to get a job, which increases the incentive of an individual to participate in the labor force. But over time, with older ages the chances of getting job also decreases in Georgia, as in the market demand is mostly on the young labor force, who received education more recently, because the skills and knowledge of older individuals, who were educated during the Soviet period cannot meet the requirements of marker demand.

The coefficient of males yields an interesting result. It is positive and significant and shows that in the case of males the probability of an individual participating in the labor market increases by 17%. One of the reasons of such gap between female and male groups can be the cultural factor, as men in Georgia are expected to care for his family as well as his parents in their old ages.

The coefficient of the variable urban has a negative and significant effect, as well as the coefficient of chronic disease. The size of both of these coefficients is high. However, the sign of coefficient of urban grabs the attention. It means that living in urban areas decreases the predicted

probability an individual participating in the labor force by 22%. This can be explained by the fact that, while the number of jobs is higher in urban areas, the competitiveness is also higher and it is difficult to get a job, besides the possibility of being self-employed is also low in the urban area compared to the rural ones. This decreases people's expectations of getting a job in urban areas, which may negatively affect on their incentive to participate in the labor force and look for a job.

To test hypothesis 2, that the individuals with higher education (more years of schooling) are more likely to be hired in the Georgian labor market, the equation (2) is estimated by the robust dprobit model. The results of estimation are reported in the second column of table 4.3. The outcome variable is higher, which is a binary variable (0/1), getting value 1 if an individual is employed at the labor market. Thus, the coefficients of independent variables predict the probability of an individual being hired in the labor market of Georgia. The Wald Chi square 36089.13with a probability value of 0.0000 indicates that model is statistically significant at 5% as well as at 1% significance level and it fits better than model without independent variables. The standard errors are heteroske-dastisity robust. The coefficient of each independent variable is significant at 5% as well as at 1% significance level.

The coefficient of each level of education is significant and positive, which means that each level of education has a positive effect on the predicted probability of individual being hired in the labor market. The higher the education level is the higher the size of coefficient of it is which means that the predicted probability of being hired at the labor market increases with more years of schooling. The exception is the coefficient of variable PhD, the predicted probability of being hired for an individual with PhD degree is 13%, which is even lower than the predicted probability of an individual with secondary professional degree being hired. This points to the fact that demand on PhD graduates is low in the country. This can be explained by the fact that the school for PhD programs in the country provide low quality education. Those graduates who complete PhD programs abroad rarely return to the country. The predicted probability of being hired in Georgian labor market for those individuals, who completed master's degree program is highest and equals 35%. The estimated results and testing the significance of variables of different education level give the

opportunity to accept the hypothesis 2 that the individuals with more education are more likely to be hired.

To test hypothesis 3, that individuals with more education are less likely to be self-employed, equation 3 is estimated using the robust dprobit model. The results of the estimation are reported in column 3 of table 4.3. The coefficient of the each independent variable predicts the probability of an individual with that characteristic being self-employed. The Wald Chi square 54358.5with a probability value of 0.0000 indicates that model is statistically significant at 5% as well as at 1% significance level and it fits the data. The standard errors are heteroskedastisity robust. Coefficient of each independent variable is significant at 5% as well as at 1% significance level.

The estimation of equation 3 shows that the higher the levels of education are, the lower the probability of being self-employed is. In the case of high school degrees, the predicted probability of being self-employed increases, the same is the result for PhD graduates. This is a logical outcome in the sense that individuals with high school degree are mostly occupied in the casual work or working in their household or agriculture. As for the PhD graduates, this can be explained by the fact that they work as private tutor to prepare high-school graduates for university entrance exams or are involved in the independent research. The coefficients of Master's degree and Bachelor's degree are negative, which means that the predicted probability of individuals being self-employed decreases with a BA or MA degree.

The factors such as living in an urban area, in the capital of the country, poor health condition, have negative effect on the predicted probability of being self-employed. The size of coefficient of urban and size of coefficient of capital are high. The predicted probability of individuals being self-employed decreases by 35% if an individual is living in the urban area and the same indicator decreases by 19% if an individual is living in the capital of the country.

The estimations of equation (1), equation (2) and equation (3) give us the possibility to test hypothesis 4, whether the region where an individual lives plays an important role in determining an economic status of an individual. The predicted probability of an individual participating in the

labor force decreases if an individual lives in the capital or urban area. The predicted probability of an individual being hired increases if an individual is living in urban area or capital, but the size of this effect is not large. The predicted probability of being self -employed decreases significantly if an individual lives in urban area or in the capital. Such results allow us to accept hypothesis 4.

The results of the estimation of the Mincer equation

In order to answer the second part of the research question, about the returns on education in Georgia and to test hypothesis 5, that the returns on education and experience is low in Georgia, equation (4) is estimated. The results of this estimation are reported on the table 4:

Table 4: the results of the estimation of the Mincer(1974) equation for the case of Georgia

Variables	**Lnwagehired**
Schooling	.054**
Potential experience	(.001)
Potentialexperiencesq	
	003 *
Dummies	(.001)
Year	
Constant	
R squared	-.023**
	(.002)
	Yes
	4.329**
	(0.289)
	0.18**
F statistics	1242.24*
Observations	**40900**

Notes: Robust standard errors in parentheses. * significant at 5%;**significance at 1%;Including year dummies;

In order for standard errors to be heteroskedastisity robust, the equation (4) is estimated by the robust option of the ordinary least square model.

The coefficients are jointly significant, as F statistics 1242.24 with probability value.000 shows. The hypothesis whether the coefficients of independent variables are different from zero or not was tested by the Wald test, which reported that the coefficients of predictors are jointly different from zero. R square 0.18 with probability value 0.000 shows that the model is significant and fits with the data at 5% as well as 1% level of significance. The model explains 18% variation of wages, which is comparable to results in other countries.

The coefficient of schooling is significant at 5% as well as at 1% significance levels. The size of the coefficient tells measured impact of schooling on changes in wage rate, the interpretation of which is that one more year of schooling increases rate of wage by 5%. As we cannot control the ability, which may be the part of standard error, in order estimate of schooling be perfectly efficient, the Griliches (1970) approach, who estimated a potential bias of proxy of ability as being 10%, will be used and report the effect of education on wage as 4.5%. the result is comparable with the education estimate of the other developed as well as developing countries, which are discussed in the literature review section.

The coefficient estimate of potential experience is significant at 5% significance level. Potential experience square points to the fact that over the years wage rate will decrease. The size of effect of potential experience is very low in case of Georgia, compared to the developed countries, but it is similar to the former Soviet Union countries. The low effect of potential experience can be explained by the structural changes in the countries, which is followed by the change of market demand on the type of labor force.

In order to check the effect of other factors such as gender, family size, place of living (capital, urban), marital status and health condition of an individual, the corresponding variables are added to the Mincer equation and extended equation is estimated by the robust option of OLS. The results of the estimation of the extended Mincer (1974) equation are reported in table 5:

Table 5: The results of the estimation of extended earning equation for the case of Georgia

Variables	**Ln wage hired**
Schooling	.050**
Potential experience	(.001)
Potential experience squared	
Family size	.005**
	(.001)
Gender	
Married	-.027**
Urban	(.002)
Capital	
Chronic disease	-.052**
	(.005)
	.596**
	(.009)
	.017**
	(.010)
	.191**
	(.010)
	.311**
	(.011)
	-.131**
	(.016)
Constant	3.866**
	(.040)
Dummies	
Year	Yes
R squared	0.35*
F –statistics	1521.38*
Observations	**40900**

*Notes: Robust standard errors in parentheses. * Significant at 5%, significance at 1%; Includes year dummies;*

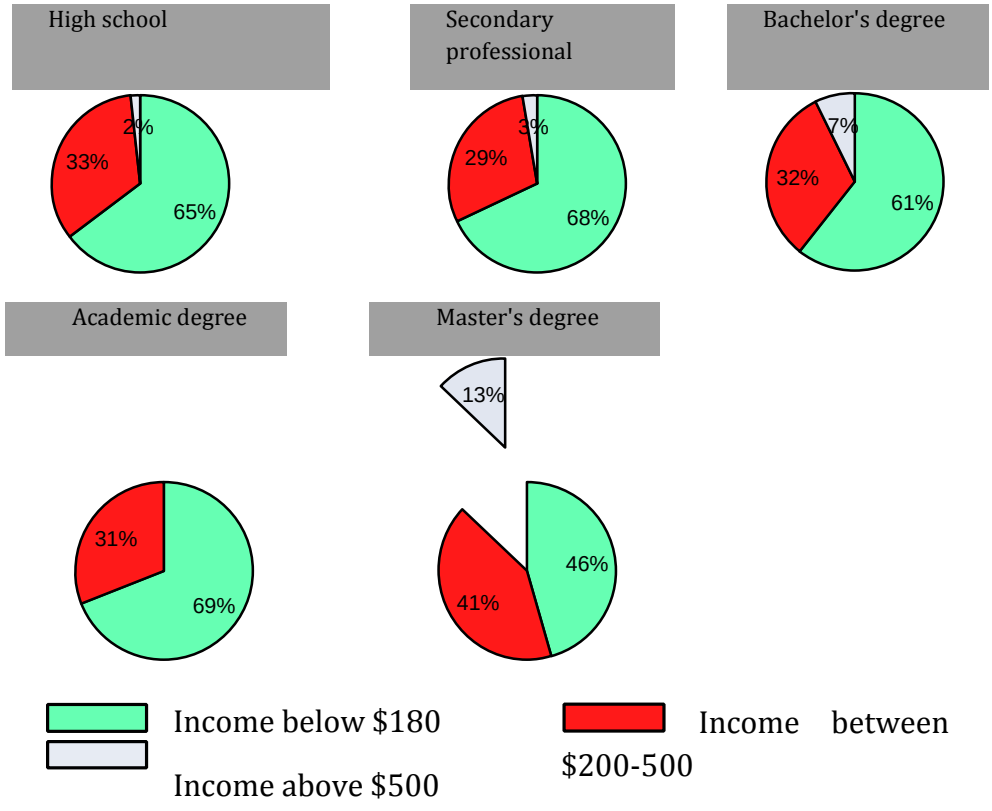
The F statistic of 987.07 with probability value 0.000 indicates that the coefficients of independent variables in the extended Mincer model are jointly statistically significant. The errors are heteroskedasticity robust.

Adding the explanatory variables in the model resulted higher indicator of R square of 0.35 with probability value 0.000. Thus, the model explains 35% of variation of the wage rate, which can be considered reasonable taking into consideration that cross sectional data is used for analyses.

The measured effects of the predictors, which were included in the original Mincer equation, are the same. It appears that gender and place of living highly contribute in the variation of wage rate. The coefficient of gender is positive and statistically significant. The size of the coefficient is high, showing that being male increases rate of wage by 60%. The coefficient urban is also statistically significant and has positive effect on the wage rate. The size of coefficient is high, meaning that living in urban areas gives 19% higher returns compared to living in the rural areas. The size of the estimator of capital is also high. An individual return on living in Tbilisi, the capital of the country, is 31% higher compared to an individual return for those, who are living in other regions of the country. Thus, to sum up, in addition to education level and potential experience, gender, living in the capital or an urban area, have a significant effect on the variation of the wage rate.

The estimated effect of education on the wage rate in Georgia can be compared with the cases in other countries, as the estimated affect varies between 3-10% like it does in the reviewed literature. In order to determine whether a 4.5% return on education is low or not for the case of Georgia, it is important to know the wage levels in the country and the earnings of individuals with different levels of education. For this reason, the share of low, medium and comparatively high-income earners is estimated for the different education groups. The sample includes the individuals, who are hired in the labor market, because it shows the level of market wage in the country. The three wage categories are distinguished. The category, monthly income below 200$, represents a low wage group, which includes the individuals, who earn below the 50% of the average wage in the country. The wage group $200-$500, covers the individuals, who earn the range of 50% up and 50% below of the country's average wage and the third group includes the individuals, who earn above the average wage plus 50% of average wage. The graph 5.3 provides the results of the estimation the distribution of wages by the levels of education:

Graph 2: The distribution of education level by wage groups in the labor market



Based on the database of Integrated Households Survey of Georgia

The results on the Graph 2 report that the individuals, who earn below the $200 has the highest share in each education group. The share of individuals with middle and comparatively high wages is higher in the higher education groups. The share of individuals with comparatively high earnings is higher in the Master's degree group compared to the other groups, but the indicator itself is low even for this group, showing that only 13% of individuals, who have master's degree, earn income

above an average wage+50% of average. Based on the results reported in graph 4.2, we can conclude that wage levels in the country are low even for individuals who have higher education. Thus, if the return on education for one more year of schooling is 4.5%, as it is predicted by the estimation of the Mincer equation, such change will not change an individual's wage level much.

Hence, to sum up the results of the estimation of the Mincer equation and results reported on graph 5.5, education does not have high returns in Georgia. One explanation of this issue can be that the quality of education is low in the country and the labor force does not satisfy the demand from the labor market. The other issue is that the wages paid in the labor market of Georgia are low.

Conclusion

This research provides interesting findings. Overall education levels in the country are high, as the estimation shows almost 85% of individuals have high school and higher education degrees. Still the unemployment rate is high in the country, it has increasing trend during 2004-2009 and achieved 16.9% in 2009. Among the employed individuals, the category of self-employed is alarming. It represents more than 50% of the labor force. Besides the individuals who have small businesses, this category includes mostly the individuals, who live in the rural areas and because of a lack of job opportunities are occupied working in their households or subsistence agriculture. That is why 72% of self-employed individuals do not have any earnings. This makes the problem of unemployment more severe than the official picture shows us, as those individuals are considered formally as employed but their state more suits to the state of unemployed individual. Considering such self-employed individuals in the employed category contributes also to the lower indicator of unemployment rate in the regions compared to the capital. The unemployment rate in the capital approaches 40% and the indicator is high also in the western Georgia.

The paper estimated separately dprobit models for probability of participating in the labor force, for the probability of being hired and for the probability of being self-employed. All the models fit the data. The

estimation results show that the predicted probability of an individual participating in the labor market increases with the level of education. The highest effect has master's degree, which increases the predicted probability of participating in the labor force by 26%. The predicted probability of an individual being hired increases with education level. The bachelor's as well as master's degree has a significantly high effect in this case, the former increases the predicted probability of an individual being hired by 30% and the latter by 35%. The predicted probability of an individual being self-employed is low for more educated people. Based on the estimation results, hypothesis 1, the hypothesis 2 and hypothesis 3 were accepted.

The estimation of the Mincer equation shows that returns on education as well as on experience are low in Georgia as it was expected. The corresponding indicators are 4.5% in the case of education and 2% in case of potential experience. The issue is that quality of education in the country is low. Because of structural changes, which have taken place during the last two decades in the country, the labor market demand and labor supply diverged and are not matching well. One more explanation of such outcome can be that overall wage level in the labor market of Georgia is low, only 8% of hired individual get the wage above $500, which is a very small number.

One more interesting finding is the effect of gender and region where an individual lives, on the labor market outcomes. The males are more likely to participate in the labor force, being hired and being self-employed. Besides, the wage rate for male individuals increases by 60%. These gender gap points to the discriminatory character of Georgian labor market. In determining economic status of individuals, the regional variable plays an important role. Individuals living in the urban areas are more likely to be hired in the labor market, individuals living in the rural areas are more likely to be self-employed. This can be explained by the fact that rural areas face a lack of job opportunities, thus the chances of being employed in the former sector is very low, that is why in order to "survive" individuals have to be self-employed.

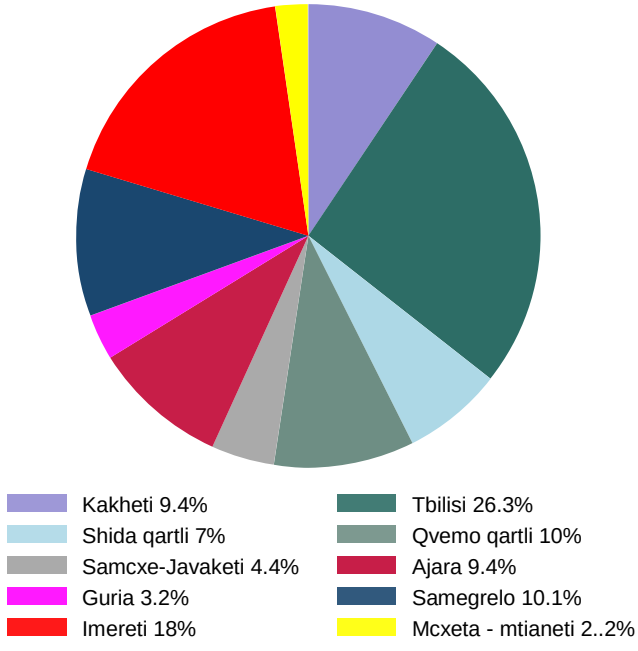
Finally, it can be concluded that overall effect of education on labor market outcome is positive and statistically significant, from this point of view there is a link between the theory of human capital and real evidences in

the country. Individual with higher education have better chances in the labor market compared to the individuals with lower level of education, but still the returns are very low.

Due to data limitations, including the variable of ability in the survey was not possible. The possible continuation of the research is doing instrumental variable estimation of returns on education in Georgia, by using the date of birth of an individual as a proxy for ability.

Appendix A

Graph A.1: The share of population in the regions of Georgia in 2009



Estimation is based on the database of Integrated Household Survey of Georgia

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