Rates of returns to human capital investments in Albania

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Abstract

This paper develops a comprehensive framework of the main hypothesis tested whether the private returns to investment in education in Albania are sufficient to provide economic incentives for a high participation rate in post-compulsory schooling. We use cross section data from the Living Standards Measurement Survey (LSMS) of 2002 and develop a comprehensive framework for our quantitative analysis of the private returns to schooling and private incentives to invest in education. We construct estimates of the private return to each post-compulsory schooling level, taking into account the effects of education on wages. Evidence from the data shows that the significant part of return to secondary education is linked to further returns to higher education. This finding might explain the reduced incentives to invest in additional human capital.

Keywords: rate of return, Mincer equation, returns to education.

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1 Introduction

Given the role of human capital quality in economic development this paper analyses the incentives to invest into education from a rates of return point of view. As Albanian upper secondary schooling participation have suffered a decline after 1990 and especially during the first decade after the political change to a market economy, and a sharp increase in tertiary education enrolments from 2000 and on, we develop a model of human capital theory to explain the behaviour of household's investment in post-compulsory schooling for their children. The main hypothesis tested is whether the private returns to investment in education in Albania are sufficient to provide economic incentives for a high participation rate in post-compulsory schooling. We use cross section data from the Living Standards Measurement Survey (LSMS) of 2002 and develop a comprehensive framework for our quantitative analysis of the private returns to schooling and private incentives to invest in education. We construct estimates of the private return to each post-compulsory schooling level, taking into account the effects of education on wages of those being in employment, and on employment probability in a thin transition labour market.

We will refer to different education levels and develop both a Mincerian model of earnings-education equation and a qualitative dependent variable model. This approach seems to provide an attractive framework since we will typically be interested in post-compulsory education levels with different returns in Albania. This choice is also confined by the available data set; the survey from which they were drawn asks only about the highest level of education completed and no information on the number of school years is reported. Moreover, the "highest level of educational attainment" by type of qualification obtained allows the rate of return to vary across types of completed education and reflects the criticism of the assumption of a constant rate of return to each year of education (Heckman, Layne-Farrar and Todd, 2006).

This paper continues in Section 2 with an overview of the human capital theory under a critical review of the technical assumptions of returns to schooling estimations existing literature. In Section 3 we present the methodology to be undertaken in this study. The econometric approach that we pursue is outlined. In Section 4 we introduce the Albanian LSMS 2002 dataset presenting the descriptive statistics. Section 5 reveals the empirical estimations and empirical findings. A general discussion and conclusions on the hypotheses tested are presented in Section 6.

2 Investment into human capital and the role of education

According to orthodox theory, human capital can be obtained in different forms: from investment in education, training, search and experience, and also from migration and health care. Typically, such accumulation takes a long time signified by the accumulation of human capital over the life cycle (Becker, 1975; Johnes, 1993; Borjas, 2005). On the other side, the benefits from investment in human capital are conventionally assumed to be durable, as knowledge and skills, unlike most goods, may not depreciate in value over time as long as they are regularly exercised (Johnes, 1993). However, rapid structural changes in labour markets, such as those found in transitional economies, may make this latter assumption inappropriate since the new market may not value previous investments whilst creating premiums for skills and competencies not previously valued.

Among the alternative forms of human capital acquisition, schooling will be our main interest here. For researchers, it is the component of human capital that is easiest to measure. Because compulsory schooling is almost universal and enrolments in post-compulsory form the basis for comparisons between countries' education systems and their population's education attainment, we focus our analysis on post-compulsory education. It is usually the latter that provides the possibilities for early specialisation and explicitly prepares youths for the labour market.

The human capital theory assumes that more educated people are typically more skilled and can be expected to be more productive than those with lower levels of educational attainment, they therefore earn more. Statistical evidence from around the world has shown that educational attainment is positively correlated with labour force participation rates, employment rates and earnings (Nickell, 1979; Fuente and Ciccone, 2002; Harmon et al., 2003; Psacharopoulos and Patrinos, 2004; Blundell et al., 2005). However, rational decisions will lead to variation in individuals' intentions with regard to the size of stock of education they will try to acquire. The distribution of human capital quantity and quality in the population depends on the trade-off between lower earnings whilst investing in additional human capital and higher earnings in the future and is affected by financial and institutional constraints. Even when, controlling for individuals' ability, human capital investment turns out to be heterogeneously distributed. More able individuals may be able to "convert" schooling into human capital more efficiently (Harmon et al., 2003) due to their higher intrinsic motivation and capability. Furthermore, as commonly emphasised, skill and ability beget future skill and ability as on-the-job

training is targeted at the more educated (Carneiro and Heckman, 2003; Cunha et al., 2006).

At the microeconomic level, human capital theory is employed to explain earnings differentials, an explanation which includes two stages: accumulation of human capital that determines worker productivity and the latter determining relative wages. The difficulty in measuring explicitly the former relationship has led to direct tests of the impact of education on earnings levels. Estimates of rates of return to education involve a method known as the Mincerian earning equation (Heckman et al., 2006). The estimates are generally derived using least squares regression, where the dependent variable is the logarithm of wages or earnings, and the independent explanatory variables include a constant, a measure of schooling (duration or attainment), observed demographic characteristics such as race, sex and experience, and other observed variables that are deemed relevant by the researcher (Psacharopoulos and Patrinos, 2004; Heckman et al., 2006; Blundell et al., 2005).

Figure 1 presents a diagram of flows/exit points between/from various stages of education to the labour market in Albania. Approximate estimations of the size of the flows into each of the points of the diagram are made taking into consideration enrolment rates in all the schooling levels in Albania.

Figure 1
Diagram of current flows through the Albanian education system
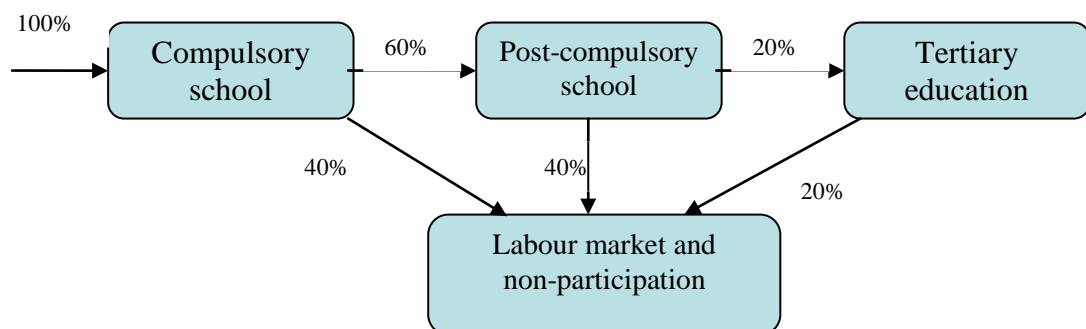
3 Methodology

As discussed in Section 2, human capital theory suggests that education is a productivity-enhancing investment which is translated into a higher probability of being in employment and receiving a higher wage for the individual that incurs the investment. Given the high rates of employment prevailing in most developed economies the former proposition is frequently ignored and in quantifying the

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economic returns to schooling research has focussed almost exclusively on wage returns generally adopting the specification proposed by Mincer (1962). These studies have developed estimates of rates of return to education, which are generally derived using least squares regression of the following wage equation:

$$\ln Y_i = \alpha + \beta S_i + \gamma_1 Exp_i + \gamma_2 Exp_i^2 + X_i\delta + u_i \qquad (1)$$

where Y is a measure of income, earnings, or wage rates, S is a measure of schooling, usually in units of years or grades completed, Exp is experience at work, X is a set of other variables assumed to affect earnings, u is a disturbance term, representing the other not explicitly measured forces affecting earnings and is assumed to be distributed independently of the Xs, S and Exp, and i is an index identifying a particular individual in the sample. The possible variables included in X are observed demographic characteristics such as race, sex and other observed variables that are deemed relevant by the researcher (Weiss, 1995).

In economic terms, we would expect that staying longer in schooling and completing higher levels of education increases both the propensity of being in employment and earnings premia. Skilled workers may take unskilled jobs while looking for employment that is more suitable to them, but the contrary is not true. Second, employers may set a higher relative demand for skilled workers as opposed to unskilled ones knowing the relative supply of both types of workers. For these reasons we estimate a different equation from (1), in order to explain the propensity to be in employment.

Mincer equation

Estimation of (1) yields the *private return* to education (Psacharopoulos and Patrinos, 2004) and under the quite restrictive assumptions highlighted below, the β parameter represents the rate of return to investment in education. Estimations of the Mincer equation focus exclusively on the economic outcomes of education. Abstracting from the consumption element and other additional investment costs, such as time, psychological and sociological costs, we would expect that, other things being equal, the discounted present value of the lifetime earnings of a highly educated person would exceed those of a less educated person. Hence, there may be a rationale for individuals to bear the direct and indirect costs of education from their current incomes, given the increased income streams in the future. Various public policies would impact on the private return to schooling. For example, Fuente and Jimeno (2008) find for 14 countries of the EU in 1996 that on average, direct subsidies raise returns by 45% while

personal taxes and unemployment benefits reduce them by 8% and 22% respectively.

Estimation of the Mincerian earnings function utilises an ordinary least squares (OLS) method in an equation including age, level of school, and job sector to explain monthly earnings, as in the following:

$$\text{Ln(Earnings}_i) = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{agesquare}_i + \beta_3 \text{secgen}_i + \beta_4 \text{secvoc}_i + \beta_5 \text{tertiary}_i + \beta_7 \text{public}_i + u_i \tag{2}$$

where the i subscript stands for the individual and the variables are defined as follows:

$\text{Ln(Earnings}_i)$ is the natural logarithm of monthly earnings. Our data provide measures of earnings at one point in time for a sample of individuals who have completed formal schooling. The choice of OLS is justified presuming only that realized schooling and unobserved labour market ability are uncorrelated. In addition, we use monthly earnings as the dependent variable, with the strong technical assumptions about the exogeneity of hours of work. We note that use of a restricted set of variables is constrained by our data availability. Furthermore, as Psacharopoulos and Patrinos (2004) suggest, only human capital variables are used in order to estimate the total effects of education on earnings. We only have a public/private sector dummy in this specification. Two major problems could make the causal interpretation of the OLS coefficient on schooling variables problematic. First, the sample of individuals for whom wage data is available is likely to be non-random one. This is particularly a concern not only in our dataset, but generally in developing country context where the majority of population is engaged in various self-employment type activities (Asadullah, 2006), such as in the agricultural sector. Second, we emphasized that not all of them in wage employment have reported their earnings.

We explain the choice of our variables and our model specifications as follows. The main explanatory variables in our regression specifications are the dummy variables related to education qualification of individual regarding post-compulsory schooling, as well as age (as defined in Table 1). We use age and its square value as proxies that measure the effect of experience.

Moreover, in the Mincer equation, we incorporate the public-private sector variable (whether the individual is employed in the public or private sector). The rationale is that, since the public sector is subject to political and not profit constraints (Melly, 2006), the civil service pay scales are compressed and we would expect a lower rate of return relative to the one based on earnings differentials in the private sector (Psacharopoulos and Patrinos, 2004).

Probit estimation

Two questions arise as to whether we should estimate: (1) employment propensity on the ILO defined LF rather than on the potential defined sample, and (2) a labour supply function apart from the employment probability. The transition literature on the determinants of labour supply is very limited. Pastore (2005) finds that the probability of participating in the LF increases with level of education for young Poles (15-30 years old). However, here we avoid developing a theory of labour supply and analyses of its determinants. The mechanisms of the neoclassical theory of labour supply may not apply to a transition economy with emerging markets, relatively high unemployment rate, and large agricultural sector acting as a refuge for many of those unemployed. We apply the Probit model of estimating the underlying latent variable formulation $(y^* \mid x)$, and the response probability $P(y=1 \mid x)$ (Wooldridge, 2002, pp. 479). Our Probit estimation is the following:

$$P_i = \Pr(Y = 1 \mid \mathrm{X}) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-t^2/2} dt \tag{3}$$

Where $P_i = (Y = 1)$ means the probability that an event occurs given the values of the X and t is a standardised normal variable, i.e., $t \sim N(0,\sigma^2)$ (Gujarati, 2003, pp. 609). The subscript i stands for the individual. P_i measures the probability of being employed (*employment=1*) relative to unemployed.

4 Descriptive statistics

In this paper we use the probability of being in employment and the monthly wage as dependent variables to estimate returns to education. First we explain how these variables are derived and continue next with interpreting the descriptive statistics. In the LSMS 2002 there are three questions asking about the labour market status of individuals, which however do not maintain a similar approach to the definition of "employment" as the standard one. According to ILO, any individual who has been working for the last two weeks for a salary or has a job although not currently working is considered as employed. The questions that check for employment status in LSMS (2002) are:

1)   Have you, during the last seven days, worked for someone who is not a member of your family, for example for an enterprise, a public or a private firm, an NGO, or another individual?

2)   Have you, during the last seven days, worked in your own farm or on one owned by a family member, or that you have rented?

3)   Have you, during the last seven days, worked in your own or for a family member's business?

A fourth question checks where there is any "yes" to the above questions. The most appropriate question in the survey to draw the dependent variable indicating labour market wages of those in employment is: "How much was your last payment (net of taxes)?" This is reported monthly, twice a month, weekly and daily. If information on job earnings was gathered on a daily, weekly or twice monthly basis they are all transformed into monthly terms[1]. Table 1 provides a list of variable definitions, the description of the explanatory variables and benchmark categories.

Table 1
The explanatory variables of our empirical analysis

Explanatory variable	Definition of variables
Employed	Dummy=1 if respondent employed in sectors other than agricultural
Have a job	Dummy=1 if respondent employed in any of the economic sectors
LnEarnings	Logarithm of monthly earnings
Age	Age of the respondent
Age squared	Age of the respondent
Marital status	Dummy=1 if married, 0 otherwise
Lived abroad	Dummy=1 if has lived abroad for at least 3 months during the last 5 years (1997-2002).
Upper secondary General	Dummy=1 if completed general upper secondary school
Upper secondary Vocational	Dummy=1 if completed vocational upper secondary school
Upper secondary	Dummy=1 if completed upper secondary school
Tertiary	Dummy=1 if completed tertiary and/or post-tertiary education

5 Empirical findings

While acknowledging some data deficiencies, overall our model specifications seem well specified and yield plausible estimates. The effect of increasing schooling levels is positive and significant, average returns rise consistently with education relative to those with primary or less education in all of our estimates, both Mincer and probit equations. However, due to the nature of our dataset (missing observations and lack of additional control variables), we suggest that interpretation of our results is taken with caution.

As noticed earlier, the standard Mincer approach that we adopt uses a static decision rule based on expected earnings profiles as of some initial period. As Heckman et al. (2003) observe cross-section estimates, as we apply in our analysis of the rate of return to schooling,

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[1] We multiply the reported sum by the appropriate factor, 22, 4, 2 respectively.

should be cautiously interpreted particularly when skill prices are changing over time or when cohort quality is changing. As emphasised above, both of these factors are likely to be important in transitional economies.

Table 2 indicates results of Mincer equation estimations. We interpret our detailed results, indicating significance levels at the 10, 5, and 1 percent levels. Higher schooling attainment increases earnings in the labour market and employees in the public sector are paid less than in the private sector. We also observe that there is a concave shape of the age earnings profile only for men. The two specifications 1 and 2 in Table 2 specifically look at differences in returns between genders. Specification 3 estimates earnings determinants for women using the dummy variable *less than 31 years old* instead of the continuous *age* variable and its square, for the reasons we explain below. Apart from the age variables for females, all the coefficients have the expected sign and are significant at one percentage level of significance in urban area. In rural areas, upper secondary school attainment is not significant for males, and only significant at 5 percent significance level for females. Job sector is also not significant for females in rural area.

Comparing the coefficients of regression results in Table 2 we observe that returns to tertiary education are the highest. We also find, surprisingly, that vocational upper secondary schooling graduates are paid more than those with the general schooling diploma. Our results suggest that in urban areas returns to schooling are considerably higher than in rural areas, especially for the upper secondary vocational and tertiary. Indeed, in the latter areas, upper secondary school attainment only has a positive effect on female earnings at five percent level of significance, and has no effect on male earning at normal confidence levels. In rural areas university graduates do receive higher returns: men (women) receive 30 (50) percent more than their counterparts with only compulsory schooling or less. However, these are lower premiums than those found from the same qualification in urban area. These findings are in line with our hypothesis on the behaviour of rural area decision-makers, who faced with relatively low returns to post-compulsory education have little incentives to invest in post-compulsory schooling unless they plan to move towards urban areas.

Table 2

Estimated coefficients for the Mincer equation

Dependent variable:		Natural Logarithm of monthly net wages				
Explanatory variables		**Females** (1)		**Males** (2)		**Females** (3)
		Coefficients	**S.E.**	**Coefficients**	**S.E.**	**Coefficients**	**S.E.**
Urban	Constant	9.36^{***}	0.23	8.94^{***}	0.24	9.37^{***}	0.04
	Age	-0.01	0.01	0.04^{***}	0.01		
	Age squared (10^{-2})	0.02	0.02	-0.05^{***}	0.02		
	Age less than 31					-0.09^{**}	0.04
	Upper secondary General	0.20^{***}	0.05	0.15^{***}	0.05	0.19^{***}	0.05
	Upper secondary Vocational	0.37^{***}	0.05	0.24^{***}	0.05	0.36^{***}	0.05
	Tertiary	0.82^{***}	0.06	0.60^{***}	0.05	0.80^{***}	0.06
	Public sector	-0.30^{***}	0.04	-0.31^{***}	0.04	-0.29^{***}	0.04
	Number of observations	611		935		611	
	Prob > F statistic	0		0		0	
	R^2	0.32		0.18		0.30	
Rural	Constant	8.06^{***}	0.77	9.18^{***}	0.28	9.13^{***}	0.13
	Age	0.05	0.04	0.03^{**}	0.01		
	Age squared (10^{-2})	-0.07	0.06	-0.05^{***}	0.02		
	Age less than 31					-0.14^{*}	0.07
	Upper secondary General	0.26^{**}	0.11	0.11	0.07	0.28^{***}	0.10
	Upper secondary Vocational	0.25^{**}	0.09	-0.03	0.06	0.26^{***}	0.09
	Tertiary	0.40^{***}	0.12	0.26^{***}	0.06	0.44^{***}	0.11
	Public sector	-0.03	0.11	-0.28^{***}	0.05	-0.03	0.11
	Number of observations	95		410		95	
	Prob > F statistic	0.00		0.00		0.00	
	R^2	0.13		0.12		0.13	

*, ** and ***, significant at 10, 5 and 1% of level of significance
S.E. = Standard errors

We now explore the returns to experience proxied by age and age squared. Focusing on the second and third rows of Table 2 we find that the coefficients are only significant for males. We calculate[2] that, all other things equal, males in urban areas receive their highest labour market earnings at an age of 42 years, and in rural area at 36,4 years. It may be that male in urban face a higher competition than in rural labour markets for which reason they have to wait longer for reaching the maximum earnings. Or, it may be due to relative younger age structure of sample in the rural area (Gjipali, 2010). The coefficient results of Table 2 indicate that Albanian female workers do not have the usual experience earnings profile. This may reflect that age is a poor proxy for experience for Albanian women because of child rearing and other family responsibilities. Nevertheless, we test whether there are differences in experience-based wage setting across two subpopulations: women older and younger than 31 years old. The last two columns of Table 2 showing a third specification of our estimation, indicate that the former are paid more than the latter (although significant only at 5 percent level of significance in urban area and at 10 percent in rural). As specification 3 in Table 2 indicates, females less than 31 years old receive wages that are 8.8 (13) percent lower than their older counterparts in urban (rural) areas.

We found overall that public sector pays less than the private one. It seems that women with a degree lower than university are more discriminated in the private sector, or that pre-tertiary schooling levels do not very well determine female earnings in the labour market. Regarding experience, experience is valued only for males in the private sector.

Probit estimation

A general finding, illustrated in Nickell (1979) is that increases in the level of an individual's education up to but not beyond university entrance leads to a strong reduction in the number of unemployment spells over their lifetime. We have argued that this relationship is likely to be particularly important in transition economies but that this possibility has been generally neglected in the literature. Our cross sectional empirical analysis allows us to find the likelihood of being in employment in Albania dependent on the level of schooling, marital status and age. Empirical estimates of the coefficients of equation 3 are presented in the Appendix. Specification 1 stands for females and specification 2 for males. Using specification 3 we assess the role of experience acquired abroad in obtaining a job in the domestic labour

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[2] Taking the first derivative of the earnings equation in relation to *age* and equalizing to zero, we find the extreme point of the earnings line, which is the maximum.

market. The Probit model applied correctly predicts "in employment" more than 70 percent of the time for all the specifications presented in the Appendix. The general findings are that the coefficients have the expected signs and are statistically significant at the one percent level of significance in almost all cases. Crucially as we anticipated, educational attainment increases the likelihood of being in employment. As we expected, there is a concave shape of the employment propensity with respect to experience, as proxied by age. Marital status affects the employment propensity of males and females in opposite directions, although, it is not significant for urban areas' females in the ILO defined labour force. This implies that married women in the potential labour force are less likely to be employed mostly due to their labour market status (we have included housewives in this sample).

We have used results of the Probit estimation (in the appendix) to compute probabilities of being in employment for an individual at the corresponding sample mean age, according to gender, marital status, and location in urban or rural area, for each schooling level. These are calculated from the cumulative normal distribution of the above stated determinants' effects and presented in Table 3.

Table 3

Estimated probabilities of being in employment

	Independent variables	Married		Un-Married	
		Urban	Rural	Urban	Rural
Female	Less than upper secondary	0.34	0.03	0.37	0.05
	Upper secondary General	0.54	0.08	0.57	0.14
	Upper secondary Vocational	0.50	0.24	0.52	0.36
	Tertiary	0.88	0.74	0.89	0.83
Male	Less than upper secondary	0.68	0.61	0.55	0.49
	Upper secondary General	0.80	0.73	0.69	0.62
	Upper secondary Vocational	0.73	0.75	0.61	0.65
	Tertiary	0.93	0.97	0.87	0.94

6 Discussion and further analysis guidelines

Understanding the differences in labour market opportunities and wages that stem from endowments such as education, experience and demographic characteristics is critical in assessing the likely outcomes of the ongoing process of economic adjustment in the Albanian labour market. Our analysis above represents one of the first attempts

to investigate the structure of labour earnings and gender discrimination both in rural and urban settings in Albania.

Although the World Bank (2006) produces similar results to our own regarding returns to schooling levels, our contribution is that we analyse these returns by gender and divided into urban-rural area samples. According to our findings, there exist significant dissimilarities between the defined groups, and hence the World Bank's model is misspecified. According to our hypothesis, the idea of coexisting segmented labour markets and the large agricultural sector in Albania could be the main reason for its relative low education/ low skill and high unemployment equilibrium. In our analysis above we found that education returns in rural areas, particularly for females, are significantly lower than for those in urban ones. This suggests our hypothesis, that there may be insufficient financial incentives to support a higher participation rate in post-compulsory schooling, may apply to Albania. We found that overall the young, and especially the least educated, are facing more difficulties in Albanian labour market. Their propensity to be employed increases noticeably only with tertiary education and there is a relatively small positive effect of upper secondary schooling. Hence, preliminary evidence from the data shows that the significant part of return to secondary education is linked to further returns to higher education. This finding might explain the reduced incentives to invest in additional human capital at the pre-compulsory level, and increased demand for tertiary for those who may afford to complete upper secondary.

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Appendix

Coefficient estimates in the Probit function (*employment = 1*)

	Specifications	Females (1)		Males (2)		Males (3)	
	Explanatory variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Urban	Constant	-1.70***	0.49	-1.62***	0.42	-2.16***	0.37
	Age	0.07**	0.03	0.08***	0.02	0.10***	0.02
	Age squared (10^{-2})	-0.06	0.04	-0.08***	0.03	-0.11***	0.02
	Married	-0.07	0.12	0.33***	0.12	0.51***	0.11
	Lived abroad					-0.62***	0.10
	Upper secondary General	0.51***	0.11	0.36***	0.09	0.42***	0.08
	Upper secondary Vocational	0.39***	0.11	0.15	0.10	0.21**	0.09
	Tertiary	1.58***	0.17	0.98***	0.13	0.93***	0.11
	Log Likelihood	-578.91		-760.59		-996.72	
	Prob > chi2	0		0		0	
	Number of observations	1064		1618		1865	
	Mean dependent variable	0.57		0.58		0.67	
Rural	Constant	-4.37***	0.59	-2.85***	0.34	-2.84***	0.33
	Age	0.15***	0.03	0.11***	0.02	0.12***	0.02
	Age squared (10^{-2})	-0.18***	0.04	-0.15***	0.02	-0.15***	0.02
	Married	-0.323**	0.15	0.30**	0.14	0.28**	0.14
	Lived abroad					-0.43***	0.09
	Upper secondary General	0.55***	0.17	0.33***	0.10	0.34***	0.10
	Upper secondary Vocational	1.27***	0.14	0.40***	0.09	0.38***	0.09
	Tertiary	2.60***	0.29	1.57***	0.21	1.59***	0.21
	Log Likelihood	-307.73		-960.08		-997.43	
	Prob > chi2	0		0		0.00	
	Number of observations	1598		1769		1904	
	Mean dependent variable	0.06		0.25		0.28	