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Investigation of Participation in Adult Education in Turkey: AES Data Analysis

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Abstract: The aim of this study is to provide the determinants of participation in adult education in a non-EU developing country, Turkey. The analysis is conducted on a set of data on individuals engaging in adult education using the Adult Education Survey (AES), applied by TurkStat. The results indicate that economic growth in the sector of employment, significantly and positively affects the odds for adult education and characteristics of men and women who take courses in the most popular fields of education vary. Moreover, younger, more educated and employed individuals are more likely to take part in adult education activities in Turkey. A person with none or only a primary school education is not active in adult education independent of gender.

Keywords: Adult education, economic growth, Turkey, non-formal education

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Introduction

Human capital endowment, which is defined as the accumulated investment in education, is one of the main pillars of the wealth of a nation. Education that is crucial for improving the quality of human capital has been understood to be formal education (Becker, 1975).

As a matter of fact, investment in education is more than providing *formal education*. There are two other venues to invest in education. Firstly, in childhood the acquisition of human capital is mostly determined by the decisions of parental resources and cultural environment. This is commonly referred as *informal education*. A mother teaching her child to play chess or a friend teaching another how to use some software are examples of informal education. Secondly, in adulthood, additions to human capital generally take place on a part-time basis through on-the-job training, night school or participation in relatively short, organized training programs. This type of education is *non-formal education*. Continuing education courses for adults are an example (La Belle, 1982). What is called as “adult education” from now on in this paper is non-formal education for adults.

In developed countries emphasis is given to adult education programs and a formal strategy is being followed to encourage and improve adult education. Starting with the “1996 Lifelong Learning for All” initiative by OECD education ministers, the developed world has started putting an increasing emphasis on the need to identify the full range of an individual’s knowledge and skills – those acquired not only at school but also outside the formal system. The European Union discloses its strategy and support on adult education with two communications: It is Never too Late to Learn (Commission Communication 2006) and Action Plan on Adult Learning (Commission Communication 2007). These documents highlight the benefits of adult education as greater employability, increased productivity and better-quality employment, reduced expenditure in areas such as unemployment benefits, welfare payments and early-retirement pensions, but also increased social returns in terms of improved civic participation, better health, lower incidence of criminality, and greater individual well-being and fulfillment. Following these communications, the EU started to implement an adult education survey (AES) in the EU area to reveal the developments.

The Adult Education Survey is the result of a comprehensive effort coordinated by EuroStat throughout Europe to collect information on public participation in lifelong learning. The survey aims to determine the rate of public participation in formal and non-formal education as well as in informal learning according to the type of respondents and the type of training to satisfy the need for reliable international comparisons with as many countries as possible in Europe and beyond. This effort is also seen as a step towards advancing common research efforts, finding new ways of measuring and developing indicators in the field of lifelong learning (European Commission³).

³See <http://lll2010.tlu.ee>

Hefler et al. (2010) provide a comprehensive report of the AES results. They find that working learners are the largest group of adult participants in formal adult education in the European continental area. Among the socio-demographic indicators, age and prior education are the most significant factors that affect likelihood of participation in all EU countries.

Following this first study of the AES data, two other studies, relevant to this paper, touching on the economics of adult education participation have appeared: The first one, Roosmaa and Saar (2010), analyze the inequality in participation to adult education in EU countries by using aggregate data from the same survey. Their results indicate that inequality in participation reflects the distribution of occupations (or workplaces with different requirements) more than the available qualifications of the workforce.

The second one is by Boeren, Holford, Nicaise and Baert (2012). Using the European AES data, this paper searches for motivational patterns among adult learners in 12 European countries using ANOVA analysis. Their results suggest that participation in adult education is affected by labor market, educational system and family structures within a country or geographical area.

Both of these studies add to the adult education participation literature by bringing the importance of the occupations and labor market to the forefront. However, another important factor that motivates individuals to participate in adult education is economic growth in the sector of employment. Investigating this claim constitutes the central thrust of the current paper.

One of the most widely accepted findings of the economics literature in the recent half-century is the significant role of human capital in economic growth models (Krueger and Lindahl, 2001). At the micro level, individuals who participate in education programs make their decision not only to increase their human capital endowment but also to enjoy improvements in their earnings and occupations (Becker, 1993). At the macro level, countries with populations endowed with more years of schooling, which is used as a proxy for human capital, experience subsequent higher economic growth rates (Barro and Sala-i-Martin, 1990). By definition, human capital endowment is a collection of formal, non-formal and informal education activities of a person. Looking through this lens, one can conjecture that participation in adult education programs has the potential to increase human capital endowment, thereby economic growth.

The contribution of the current paper is to make the argument that economic growth influences adult education rather than the typical argument that schooling and training promote economic growth. In other words, there may be a cyclical interaction between education and economic growth: Education may promote economic growth as suggested by a large volume of economics literature and that economic growth may in turn spur the need for more advanced skills which increases the need for adult education.

The existing economics literature is largely silent on the impact of economic growth on adult education. However, one of the important determinants of getting involved in non-formal education in adulthood is increasing one's own endowment of knowledge and skills to generate a steady and higher future income stream. In this context, improved economic performance of a sector may signal the need for

skill updating both for the incumbents and the new entrants into that sector. Incumbents choose to update and further their skills to adapt to new production methods and to compete with new entrants, respectively. New entrants, on the other hand, are in unavoidable need of new skills necessary for success in the rising sector and therefore choose to get involved in adult education activities. In any case, in this line of thought, economic growth in a sector is expected to induce more non-formal education in adulthood. Therefore, this paper introduces economic growth in the sector of employment as a determinant of adult education participation by providing a quantitative analysis.

Study Design

Instrument and Participants

There is a paucity of quantitative analysis of adult education programs in Turkey due to scarcity of data sources, although Turkey has a long tradition of adult education with established institutes and program areas⁴. The Ministry of Education is the main responsible body. The general Directorate of Lifelong Learning coordinates and regulates the public, private and voluntary institutions involved in adult education. They provide general indicators about the number of adult education programs in Turkey on a yearly basis; however, there has been no archival data about the participation of private households in non-formal education and training activities until recently. TurkStat has released Turkey's Adult Education Survey (AES) data in 2012 and there has been no research based on this data yet.

The analysis is conducted on the archival data gathered by TurkStat by using the AES, which aims to compile information on formal, non-formal education and informal learning activities to develop professional or personal space of individuals in the knowledge and skills in the context of lifelong learning. The Turkish AES was conducted during the period between October 2007-January 2008 to all individuals at 18 years of age or older. TurkStat discloses the data for 25-64 age range in line with EuroStat.

The sampling design of the AES is 2-staged, stratified, systematic, cluster-sampling method⁵. The survey generates information on participation rate of individuals according to age group, gender, education attainment level and labor status, as well as other indicators such as participation of work related education, participation in education during working hours and reasons for not to participate in education. The dataset lacks any spatial detail. Likewise, there is no data to evaluate the return to adult education in Turkey.

The survey covers all settlements within the boundaries of the Republic of Turkey; however, settlements with a population of below 100 have been kept outside the scope. The sample size of this study is 29,319. The sample consists of

⁴ The history and development of non-formal education implementations in Turkey are summarized in Bilir (2007).

⁵ www.tuik.gov.tr

47 percent males and 53 percent females. Summary statistics are provided in Table 1.

<Insert Table 1 here>

Age is the age of the individual in year 2007. As seen in Table 1 average age in the sample is 41.5 and *Age* varies between 25 and 64. *Years of Schooling* is an indicator for the individual's formal education level and ranges between 0 and 20 with an average of 6.5 years for adults in Turkey in 2007. *Father's Education* is 1 if the father of the individual has none to primary education and 0 otherwise. On average only 7 percent of fathers have secondary or more education. *Married* is the indicator variable for marital status and more than 86 percent of individuals in the sample are married. *Urban* takes the value of 1 if the individual lives in a city and 0 otherwise. About 70 percent of the sample lives in cities. *Young Child* is to control for the effects of dependents in the household. It takes the value of 1 if there is a child less than 6 years of age in the household and 0 otherwise. On average 25 percent of individuals in the sample have a young child in their households.

VA Growth is the annual average growth rate of value added for the period 2003-2006 in 49 NACE Rev.2 sectors. The data source of the sector-specific data is the Annual Industry and Service Statistics Database, generated by surveys covering the enterprises in the manufacturing and services, carried out by the TurkStat. On average, the sector of employment has experienced a 17.8 percent value added growth between 2003 and 2006.

Employed takes the value of 1 if the individual is employed and 0 otherwise. About 46 percent of individuals in the sample are employed. *Experience* is the years passed after initial employment and on average 11.6 years for working individuals in the sample. The size of establishment that the individual works for is also controlled for in the analysis. *Large Firm* is defined as a firm with 50 workers or more. About 32 percent of working individuals in the sample work in large firms. A *Medium Firm* has 11 to 49 workers and about 25 percent of working individuals in the sample work in medium size firms. *Full Time* takes the value 1 if the individual works full time and 0 otherwise. On average 94 percent of working individuals have full time status at work in the sample.

Income earned is one of the most important variables in estimations involving particularly the working individuals. There is no continuous variable for income since it is not made available by TurkStat. However, the level of income may be controlled by using a variable called *Above Min Wage* that takes the values of 1 if the individual earns an income higher than the minimum wage in Turkey in 2007 and 0 otherwise. About 24 percent of working individuals in the sample earn an above minimum wage.

Finally, to control for the skill level of the working individuals the OECD taxonomy is used. *HS-WC*, high skilled-white collar workers, takes the value of 1 if ISCO codes are 1 to 3 (legislators, senior officials and managers, professionals and technicians and associate professionals) and 0 otherwise. About 30 percent of individuals are classified as high skilled white collar in the sample. *HS-BC*, high skilled-blue collar workers, takes the value of 1 if ISCO codes are 6 or 7 (skilled agricultural and fishery workers and craft and related trades workers) and 0

otherwise. About 34 percent of individuals are classified as high skilled blue collar in the sample.

LS-WC, low skilled-white collar workers, takes the value of 1 if ISCO codes are 4 or 5 (bureau workers, customer care specialists and sales personnel) and 0 otherwise. About 14 percent of individuals are classified as high skilled white collar in the sample. *LS-BC*, low skilled-blue collar workers, takes the value of 1 if ISCO codes are 8 or 9 (machine operators, drivers, unqualified workers) and 0 otherwise. About 22 percent of individuals are classified as high skilled blue collar in the sample.

The Situation of Turkish Sample in EuroStat Sample

The average adult education participation rate for 27 countries in the AES sample is 31.3 percent in 2007 (Hefler et. al. 2011). Moreover, women's participation is lower than men's by only 1.4 percentage points. In other words, there is almost no gender gap in adult education participation in the EU countries. In Sweden, participation in adult education is the highest (69.4 percent), more than twice the average. On the other hand, in Romania, which joined EU in 2012, the adult education participation is the lowest (4.7 percent).

Turkey is the bottom fourth country in adult education participation. The ratio is only 12.8 percent in 2007, significantly below the EU average. Moreover, there is a significant difference of 6.6 percentage points between the participation ratios of men and women.

Methodology

The binary logistic regression model is used to analyze the determinants of participation in adult education. Hence, the probability of participating in adult education is assumed to follow a logistic distribution. The generalized form of the equation can be written as

$$L = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_1 x_i + \beta_2 z_i + \varepsilon_i \quad (1)$$

where L is the dependent binary variable, x_i is the sector-specific variable, z_i is a vector of individual-specific variables and ε_i is a stochastic error term.

The stochastic error term ε_i is estimated in multiple ways (robust variance covariance estimates, clustering around age and education bins) and the most conservative estimates are reported.

In the case of binary logistic regression model, the slope or marginal effects are calculated as

$$\frac{\partial L}{\partial x_i} = \hat{P}_i(1 - \hat{P}_i)\beta_1 \quad (2)$$

$$\frac{\partial L}{\partial z_i} = \hat{P}_i(1 - \hat{P}_i)\beta_2' \quad (3)$$

Baseline Specification

The dependent variable is binary, which takes the value of 1 if the individual participated in adult education activities in the past 12 months and 0 otherwise. On average 12.8 percent of adults in Turkey participated in adult education programs in 2007.

$$\begin{aligned} \Pr(\text{Participation}) = & \\ & \beta_0 + \beta_1 \text{Age}_i + \beta_2 \text{Years of Schooling}_i + \beta_3 \text{Father's Education}_i + \\ & \beta_4 \text{Married}_i + \beta_5 \text{Urban}_i + \beta_6 \text{Employed}_i + \beta_7 \text{Young Child}_i + \varepsilon_i \end{aligned} \quad (4)$$

Employed Specification

Next, this section focuses on the employed population in the sample to investigate if economic growth in the sector of employment has an important role in determining the participation in adult education. On average 19.8 percent of employed adults in Turkey participated in adult education programs in 2007.

$$\begin{aligned} \Pr(\text{Participation}) = & \beta_0 + \beta_1 \text{VA Growth}_i + \beta_2 \text{Age}_i + \beta_3 \text{Years of Schooling}_i + \\ & \beta_4 \text{Father's Education}_i + \beta_5 \text{Married}_i + \beta_6 \text{Urban}_i + \beta_7 \text{Young Child}_i + \\ & \beta_8 \text{Experience}_i + \beta_9 \text{Large Firm}_i + \beta_{10} \text{Medium Firm}_i + \beta_{11} \text{Full Time}_i + \\ & \beta_{12} \text{Above Min. Wage}_i + \varepsilon_i \end{aligned} \quad (5)$$

Sub-Samples in Fields of Adult Education

Finally, this section explores the determinants of participation in adult education in the most popular non-formal education fields in Turkey, namely Business (marketing, advertising, accounting, etc.), Language (foreign languages), Humanities (religion, history, etc.), Craft Skills (ceramics, jewelry, wood/stone carving, handicrafts, etc.), Computer Use (software, internet use) and Transport Services (all types of driving, air traffic, cabin crew training, etc.).^{6,7} Both the baseline (equation 4) and the employed (equation 5) specification are used to estimate the participation in adult education in these fields.

Results

Due to the marked differences in opportunities, motives and educational attainment across genders, the results of the baseline and employed regressions are reported in Tables 2 (women) and 3 (men). Tables 2 and 3 show logistic regression results for the baseline specification in column (1), the employed specification in column (2) and then continue to report results by different skill levels in columns (3) through (6) for the employed specification.

⁶ Most popular fields of adult education are defined as fields where 150 or more individuals participate in adult education in the sample of 3,632 individuals.

⁷ The fields of adult education that are analyzed on Tables 6-9 constitute 46 percent of participants.

Baseline

As can be seen from the column (1) of Tables 2 and 3, *Age*⁸, *Years of Schooling* and *Employed* increase the odds for participation in adult education. In other words, younger, more educated and employed individuals are more likely to take part in adult education activities in Turkey.

<Insert Table 2 here>

<Insert Table 3 here>

When the results of the baseline regressions (Column 1) are scrutinized more carefully in Tables 2 and 3, noticeable differences across genders can be observed. While *Father's Education* is an important determinant of women's participation in adult education, this variable does not have a pronounced effect on men's choice of adult education. In other words, women with educated fathers are more likely to take part in education activities later in life.⁹ An interesting finding is that, mother's education is always insignificant in all regressions due to insufficient variation in mother's education in the sample. 28,502 out of 29,203 mothers have none to primary education. Therefore, this variable was omitted in the regressions.

One more important difference between women and men is observed when the variable *Young Child*¹⁰ is considered. While the existence of a young child in the household is important in shaping an average woman's decision to participate in non-formal education activities in Turkey; it has no effect for an average man's decision.

The final noticeable difference is geographic. While *Urban* has a negative and significant effect on men's odds for adult education across the board, for women this variable has no such effect. Independent of his level of education, an average man in Turkey is less likely to take part in adult education programs if he resides in a city.

These results are mostly robust when different education levels are considered for women and men¹¹.

Employed Individuals

The baseline results report the effects of demographic characteristics such as gender, marital status, parents' education on a person's involvement in non-formal education. However, decision to participate in adult education is driven by complex forces, which have their roots deep in economics as well.

In this section, the analysis of working population and a more in-depth investigation of whether economic growth in the sector of employment induces higher participation in adult education are presented. *VA Growth*¹² in the sector of

⁸ The possibility of nonlinearity in *Age* is considered. However, *Age*² variable is not statistically significant in the estimations.

⁹ A more relevant variable here would be the husband's education for the case of Turkey, however, the data set lacks that information.

¹⁰ There is no information on other types of dependents such as elderly or disabled. Other age cuts for young children are used as well; the results are qualitatively the same.

¹¹ Results are available upon request.

¹² The results are robust to alternative definitions of sector's previous growth using employment, production or sales and available upon request.

employment over 2003-2006 period is used as a proxy for previous economic performance.

Column (2) of Tables 2 and 3 present the results for employed women and men, respectively. *VA Growth* increases the likelihood of participation in adult education in the full working sample. For instance, the growth rate of the automotive sector for the period 2003-2006 is 9.4 percent. The adult education attendance rate of the employees of the sector is around 40 percent. On the other hand in the textile sector where the growth rate is around 6 percent, the attendance is limited to 14.5 percent below the average of the employed sample.

In addition, the same result goes for low and high skilled white-collar subsamples in Columns (3) to (6) of the same tables. In other words, both high and low skilled white-collar workers employed in well-performing sectors are more likely to be involved in adult education, independent of gender.

When the technology driven economic growth experienced by the world in the last two decades is considered, it gets clear that sectors that employ white-collar workers intensively are the ones that had higher economic growth in the past. Therefore, skilled workers in these sectors face tougher competition for two reasons: One is due to the dynamic, information-intensive nature of their line of business; and the other one is due to new entrants into their sector from a younger and better-educated labor pool. Both of these forces work to increase the odds in favor of adult education activities undertaken by white-collar workers in sectors with high economic growth.

Tables 2 and 3 report individual characteristics of the working sample, as well. The results show that young, educated individuals, who live in rural areas, work in large or medium size firms and earn minimum wage or lower are more likely to partake in adult education. For men, being an experienced worker in his current job is a significant indicator of participation likelihood, whereas experience does not matter for women in participation likelihood. The impact of father's education and marital status is not as clear as it is in the baseline regressions reported in Column (1) of Tables 2 and 3. Working full time or part time has no significant effect on odds for adult education.

Next, marginal effects of independent variables in the regressions presented in Tables 2 and 3 are calculated¹³. Marginal effects analyses show that there is a significant difference between the probability of adult education participation of women and men at different ages. Between the ages 25-33, men participate in adult education more than women do. The likelihood flips at age 33 and women older than 33 participate in adult education more than men do.

Moreover, a person with none or only a primary school education is not active in adult education independent of gender. However, a woman who receives 8 years of schooling and more is much more likely to take non-formal courses than a man with the same years of schooling as illustrated in Figure 1. The likelihood of women with 20 years of schooling to attend adult education is 7 percentage points higher than men with the same years of schooling.

<Insert Figure 1 here>

¹³ The marginal effects results are available upon request.

As indicated in Table 3, for employed men *Experience* is a significant determinant of adult education participation, whereas it is not important for women's participation decisions. The likelihood of attending non-formal courses for a man who just started to work is only 17 percent while it is around 35 percent for a man working for over 40 years. The impact of experience at work is much smaller for women in attending adult education.

Tables 2 and 3 reported that previous growth performance of the sector of employment is a determinant of adult education participation decisions. Figure 2 illustrates this relation. If the economic growth in the sector represented by *VA Growth* is high, the probability of a worker to participate in adult education increases significantly.

<Insert Figure 2 here>

Fields of Adult Education

The fields of adult education considered in the study are business, language humanities, craft skills, computer use and transportation¹⁴.

In the field of business, the likelihood of participating in the non-formal education activities is higher for younger, more educated, employed individuals. While married men are more likely to attend business programs, marital status has no effect on a woman's attendance in business programs. On the other hand, while women residing in cities are more likely to take business classes, men are indifferent to place of residence. Moreover, having a young child in the household hinders the likelihood of women attending in the field of language programs. The same is not true for men.

Participation in the field of humanities such as religion classes is independent of *Age*, *Married* and *Employed*. Individuals residing in rural areas are more likely to attend humanities programs. Different from women, men with more years of education are more likely to participate in non-formal humanities programs.

The field of craft skills is mainly a women's activity. Probability of attending craft skills education for an average woman is determined by *Years of Schooling*, *Urban*, *Employed* and *Young Child*. Educated, stay-at-home, rural women with no young children at home are more likely to participate in crafts education.

When it comes to the field of computer use programs, the only difference between women and men comes from their employment status. Employed women are more likely to attend computer use classes. Younger, more educated, employed women are more likely to take driving-related lessons while classes in transport services are only of interest to young men.

<Insert Table 4 here>

<Insert Table 5 here>

Tables 4 and 5 go one step further and report the results for employed population for women and men, respectively. Here, the importance of economic performance, income level and skill composition are investigated.

¹⁴ The regression results are available upon request.

Table 4 shows that growth in the sector of employment affects only the chances of attending in the field of business programs for women. Single, employed women are more likely to participate in the field of language, while only part-time employed women are interested in humanities programs. The programs in the field of craft skills are attended by older and more educated employed women residing in rural areas. Computer use programs are attractive to educated part-time employed women, while only younger employed women partake in transport services programs. An important result in Table 4 is that skill composition of the jobs (blue collar, white collar) held by women has no effect on the probability of attending different adult education programs.

Table 5 presents that more educated men with high skilled jobs, working at large firms are more likely to participate in the field of business programs. Language programs are attended by more educated men with little work experience who earn below minimum wage. Craft skills programs are attractive to part-time, high skilled employed men who are earning above minimum wage at a medium size firm.

Discussion and Implications

Aging population introduces major shifts to the labor markets in the form of changing education needs. Speed of technological change requires continuous skill updating in the labor markets. The existing level of education acquired through the formal school system is unable to cope up with the skills and knowledge required by today's employers. Consequently, there is a permanent tension between the supply side of the knowledge offered by the possible employees and the demand side of the skills required by the employers. As the most important component of lifelong learning, adult education provides a bridge between the school system and the labor market; hence it is considered as one of the crucial components of human capital growth.

This paper makes the argument that economic growth influences adult education in addition to the widely accepted argument that a higher economic growth would be achieved through schooling and training. In other words, there may be a cyclical interaction between education and economic growth. Particularly, this paper introduces economic growth in the sector of employment as a determinant of adult education participation by providing a quantitative analysis on Turkey.

The main result of the paper is that past performance of the sector of employment significantly and positively affects the odds for adult education. This may be interpreted as suggestive evidence for economic growth triggering involvement in adult education to increase one's own endowment of knowledge and skills to generate a steady and higher future income stream.

The second result that needs to be highlighted is that one of the significant determinants of participation in adult education is "years of schooling". As the years of schooling increase, the likelihood of participating in adult education increases as well, independent of gender. The initial level of education of the

individuals and their participation in adult education in Turkey suggest that graduates of high school and higher education are more likely to participate in adult education. In other words, presently the existing adult education involves mostly the educated workforce. This result is consistent with the EU; a low level of initial education is a strong barrier for adult education.¹⁵

This finding is critical for policy makers since there seems to be a need for a strategy for low education level individuals. One of these strategies might be the recognition and validation of prior learning including non-formal education activities. EU has taken broad action for the recognition of prior learning, which could be adopted in Turkey as well to reduce the disadvantages of individuals with lower years of schooling.

Finally, the structure of participation in different fields of adult education was investigated. The results suggest that the characteristics of men and women who take courses in the most popular fields of education vary. For example, business programs appear mainly as a men's activity, which would further widen the gender gap in the quality of human capital. However, there is an evident contradiction of Turkey's policy of increasing the participation of women in labor force and the low participation of women in business programs. Therefore, the results can guide the policymakers to redesign the programs of adult education to reduce the gender gap.

In conclusion, as a response to demographic ageing and to the broader economic and social issues around the globe, adult education rises as a useful tool in enhancing the quality of human capital. Moreover, in the developed world, social inclusive growth has given a heavy weight instead of economic growth, which emphasizes the importance of adult education in further supporting the disadvantaged groups in the population such as women.

From this perspective, the results of this paper may have important implications for education systems of the developing countries like Turkey. When compared to developed countries, Turkey, like many other developing countries, comes up as a laggard in adult education participation. It is important to identify the characteristics of participants and the programs that they are involved in because there will be an obvious need to broaden the scope of adult education programs in line with the economic and social inclusive growth targets of these countries. In this perspective, Sweden can serve as a role model in developing a comprehensive system of education, one that includes early childhood, formal education and adult education in a seamless and structured series of learning opportunities to meet the labor market's needs for the skills required for modern production of goods and services.

Further Research

This paper investigates the determinants of decision of participation in adult education in a developing country, Turkey, and highlights the importance of

¹⁵ Robert, Sagi and Balogh (2010)

economic growth in this decision. However, there are some specific questions about adult education that future studies should investigate to guide policymakers, which are beyond the scope of this paper.

Firstly, understanding who is participating in adult education will be more valuable and useful, if it can be linked in some way to the returns to adult education. If returns to adult education are systematic, one might be able to measure the contribution of adult education in human capital formation thereby economic growth.

Secondly, some other factors in Turkey might affect adult education participation in addition to what is considered in this paper. The availability (or lack thereof) of programs, the sponsor of programs (existing workplaces, private enterprise, vs. government, vs. local community development programs) and the cost of programs (free vs. self-paid vs. employer-paid) would also have an impact on the participation decision of individuals in the adult education.

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Table 1. Summary Statistics

Variable	Full		Female		Male	
	Observation	Mean	Observation	Mean	Observation	Mean
Adult Education	29319	0.124	15476	0.094	13843	0.157
VA Growth	8937	17.811	1752	19.286	7185	17.451
Age	29319	41.503	15476	41.272	13843	41.762
Years of Schooling	29319	6.532	15476	5.527	13843	7.655
Father's Education	29319	0.928	15476	0.927	13843	0.929
Married	29319	0.862	15476	0.842	13843	0.885
Urban	29319	0.698	15476	0.692	13843	0.704
Young Child	29319	0.251	15476	0.239	13843	0.264
Employed	29319	0.462	15476	0.221	13843	0.731
Experience	13530	11.595	3417	12.432	10113	11.312
Large Firm	10163	0.318	3012	0.260	7151	0.343
Medium Firm	10163	0.247	3012	0.202	7151	0.265
Full Time	13530	0.936	3417	0.858	10113	0.962
Above Min. Wage	29319	0.244	15476	0.088	13843	0.418
HS-WC	29319	0.140	15476	0.066	13843	0.223
HS-BC	29319	0.158	15476	0.082	13843	0.243
Business	29319	0.020	15476	0.010	13843	0.031
Language	29319	0.005	15476	0.006	13843	0.004
Humanities	29319	0.007	15476	0.012	13843	0.002
Craft Skills	29319	0.007	15476	0.012	13843	0.001
Computer Use	29319	0.008	15476	0.005	13843	0.011
Transport Services	29319	0.010	15476	0.004	13843	0.016

Table 2. Baseline and Employed Specifications, Women

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Employed				
		All	HS-WC	LS-WC	HS-BC	LS-BC
Value-Added Growth		0.018*** (0.005)	0.015** (0.006)	0.018* (0.011)	0.001 (0.026)	0.008 (0.015)
Employed	0.692*** (0.065)					
Age	-0.024*** (0.003)	-0.022** (0.010)	-0.019 (0.013)	-0.030 (0.025)	-0.007 (0.048)	-0.036 (0.027)
Years of Schooling	0.174*** (0.008)	0.145*** (0.019)	0.094*** (0.030)	0.120*** (0.045)	0.052 (0.103)	0.133** (0.062)
Father's Education	-0.295*** (0.091)	0.097 (0.156)	0.166 (0.171)	0.154 (0.449)	-1.255 (1.512)	-0.078 (0.962)
Married	-0.012 (0.078)	-0.169 (0.142)	-0.381** (0.183)	-0.060 (0.336)	1.912** (0.892)	0.417 (0.535)
Urban	0.030 (0.075)	-0.721*** (0.166)	-0.969*** (0.264)	-0.791** (0.389)	0.036 (0.741)	-0.614 (0.377)
Young Child	-0.348*** (0.079)	0.105 (0.160)	0.048 (0.200)	0.117 (0.389)	-0.011 (0.797)	0.435 (0.456)
Experience		0.017 (0.011)	0.025* (0.014)	-0.034 (0.034)	-0.016 (0.038)	0.051 (0.036)
Large Firm		0.813*** (0.163)	0.525** (0.226)	1.371*** (0.366)	2.459** (0.968)	1.242** (0.531)
Medium Firm		0.565*** (0.166)	0.550** (0.227)	0.157 (0.353)	2.201** (0.999)	0.813 (0.648)
Full Time		-0.333 (0.232)	-0.166 (0.315)	-0.877** (0.420)	-1.775 (1.115)	-0.457 (0.718)
Above Min. Wage		-0.261* (0.152)	-0.226 (0.209)	-0.162 (0.334)	-0.660 (0.799)	-0.272 (0.548)
Constant	-2.486*** (0.195)	-1.627*** (0.509)	-0.632 (0.767)	-0.696 (1.289)	-2.240 (2.523)	-1.853 (1.667)
Observations	15,476	1,587	738	356	156	337
Pseudo R-squared	0.164	0.155	0.0701	0.132	0.132	0.107

Notes: Robust standard errors are in parentheses. *, **, *** denote significance at the 10%, 5%, 1% level, respectively.

Table 3. Baseline and Employed Specifications, Men

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Employed				
		All	HS-WC	LS-WC	HS-BC	LS-BC
Value-Added Growth		0.010*** (0.003)	0.009** (0.004)	0.018** (0.008)	0.008 (0.007)	-0.001 (0.006)
Employed	1.090*** (0.086)					
Age	-0.024*** (0.003)	-0.034*** (0.006)	-0.036*** (0.009)	-0.042*** (0.014)	-0.045*** (0.013)	-0.023* (0.012)
Years of Schooling	0.179*** (0.007)	0.123*** (0.010)	0.094*** (0.017)	0.087*** (0.029)	0.097*** (0.025)	0.129*** (0.027)
Father's Education	-0.083 (0.084)	-0.064 (0.111)	0.142 (0.133)	-0.608* (0.325)	-0.814** (0.328)	-0.133 (0.336)
Married	0.021 (0.081)	-0.001 (0.108)	0.065 (0.161)	0.289 (0.290)	-0.096 (0.239)	-0.257 (0.239)
Urban	-0.351*** (0.057)	-0.593*** (0.089)	-0.539*** (0.166)	-0.936*** (0.210)	-0.283 (0.185)	-0.741*** (0.177)
Young Child	-0.073 (0.061)	-0.101 (0.082)	-0.147 (0.133)	0.232 (0.203)	-0.325* (0.173)	-0.143 (0.180)
Experience		0.024*** (0.005)	0.024*** (0.009)	0.051*** (0.016)	0.026** (0.011)	-0.012 (0.013)
Large Firm		0.926*** (0.086)	0.767*** (0.139)	1.533*** (0.226)	0.846*** (0.176)	1.065*** (0.195)
Medium Firm		0.477*** (0.091)	0.572*** (0.143)	0.890*** (0.230)	0.161 (0.200)	0.170 (0.228)
Full Time		0.175 (0.261)	-0.072 (0.362)	0.539 (1.247)	0.103 (0.600)	1.303 (1.033)
Above Min. Wage		-0.340*** (0.080)	-0.335** (0.145)	-0.008 (0.209)	-0.247 (0.161)	-0.321* (0.180)
Constant	-2.860*** (0.197)	-1.453*** (0.372)	-0.830 (0.556)	-1.711 (1.465)	-0.172 (0.866)	-2.417* (1.257)
Observations	13,843	5,579	1,667	917	1,441	1,554
Pseudo R-squared	0.132	0.113	0.0760	0.146	0.0753	0.0996

Notes: Robust standard errors are in parentheses. *, **, *** denote significance at the 10%, 5%, 1% level, respectively.

Table 4. Fields of Adult Education, Skills of Employed Individuals, Women

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Business	Language	Humanities	Craft Skills	Computer Use	Transport Services
Value Added Growth	-0.023** (0.009)	-0.007 (0.015)	-0.020 (0.014)	0.007 (0.026)	0.019 (0.016)	0.003 (0.015)
Age	-0.064*** (0.022)	-0.027 (0.032)	0.004 (0.039)	0.080** (0.032)	-0.002 (0.034)	-0.130** (0.052)
Years of Schooling	0.056 (0.035)	0.271*** (0.093)	0.080 (0.100)	0.148** (0.062)	0.141*** (0.047)	-0.025 (0.073)
Father's Education	0.083 (0.304)	-0.018 (0.343)		1.086 (1.288)	0.221 (0.454)	-0.663 (0.575)
Married	-0.309 (0.283)	-1.260*** (0.436)		0.671 (0.809)	-0.419 (0.433)	0.958 (0.608)
Urban	0.324 (0.422)	-0.367 (0.509)	-0.989 (1.003)	-1.153* (0.663)	-0.109 (0.549)	-0.432 (0.579)
Young Child	0.211 (0.299)	0.052 (0.601)	-0.560 (0.933)	-0.790 (1.078)	0.588 (0.455)	-0.367 (0.600)
Experience	0.032 (0.025)	-0.040 (0.042)	-0.030 (0.040)	-0.007 (0.034)	0.037 (0.032)	0.101* (0.058)
Large Firm	0.357 (0.328)	0.724 (0.492)		-0.911 (0.809)	-0.402 (0.577)	-0.058 (0.598)
Medium Firm	-0.168 (0.345)	-0.068 (0.568)	-0.260 (1.142)	0.180 (0.563)	0.402 (0.480)	-0.199 (0.653)
Full Time	0.055 (0.555)		-2.007** (0.961)	-0.395 (0.926)	-1.176** (0.526)	0.282 (1.170)
Above Min. Wage	0.052 (0.295)	-0.559 (0.486)	-0.008 (0.782)	0.142 (0.740)	0.785 (0.487)	0.595 (0.618)
HS-WC	0.370 (0.327)	-0.158 (0.501)	1.765 (1.312)	-1.222 (0.922)	0.379 (0.606)	-0.025 (0.800)
HS-BC	-1.086 (0.768)		1.801 (1.213)	-0.765 (1.423)		
Constant	-1.798* (1.054)	-4.844*** (1.865)	-3.700 (2.416)	-8.960*** (2.839)	-5.680*** (1.535)	-0.726 (2.448)
Observations	1,587	1,330	593	1,587	1,431	1,431
Pseudo R-squared	0.0658	0.180	0.173	0.130	0.0949	0.0679

Notes: Robust standard errors are in parentheses. *, **, *** denote significance at the 10%, 5%, 1% level, respectively. In column (2) Full Time and HS-BC, in column (3) Father's Education, Married and Large Firm, in columns (5) and (6) HS-BC are dropped due to perfect prediction of failure.

Table 5. Fields of Adult Education, Skills of Employed Individuals, Men

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Business	Language	Humanities	Craft Skills	Computer Use	Transport Services
Value Added Growth	-0.010* (0.005)	-0.019 (0.014)	0.018 (0.024)	-0.004 (0.056)	0.013 (0.008)	0.011 (0.008)
Age	-0.032*** (0.012)	-0.022 (0.027)	0.037 (0.083)	0.013 (0.058)	-0.038** (0.019)	-0.075*** (0.018)
Years of Schooling	0.105*** (0.023)	0.174*** (0.057)	0.117 (0.168)	0.239 (0.170)	0.140*** (0.037)	-0.066** (0.032)
Father's Education	0.059 (0.191)	0.555 (0.455)		0.230 (1.013)	0.441 (0.356)	-0.466 (0.316)
Married	0.211 (0.210)	-0.733 (0.476)			-0.307 (0.316)	-0.369 (0.259)
Urban	-0.192 (0.191)	-0.041 (0.486)	-1.428 (0.900)		-0.485 (0.302)	-0.303 (0.227)
Young Child	-0.205 (0.165)	0.030 (0.412)	1.278 (1.260)		0.102 (0.262)	0.091 (0.214)
Experience	0.018* (0.011)	-0.070** (0.035)	-0.028 (0.053)	0.059 (0.062)	0.012 (0.020)	-0.008 (0.017)
Large Firm	0.788*** (0.180)	0.292 (0.383)	-0.251 (0.558)		0.486 (0.333)	0.060 (0.219)
Medium Firm	0.327* (0.198)	-0.026 (0.441)		1.548* (0.862)	0.879*** (0.314)	-0.249 (0.237)
Full Time	1.561 (0.990)	-0.220 (1.026)		-1.582* (0.958)	-0.021 (0.802)	1.012 (1.006)
Above Min. Wage	-0.184 (0.183)	-0.774* (0.424)	0.293 (0.597)	3.399** (1.559)	-0.575* (0.310)	-0.062 (0.226)
HS-WC	0.730*** (0.212)	0.711 (0.489)	15.345 (0.000)	16.757*** (2.323)	0.523 (0.336)	-0.253 (0.287)
HS-BC	-0.547** (0.255)	-0.692 (0.796)	14.122*** (1.308)	15.808*** (2.288)	-0.172 (0.434)	-0.141 (0.219)
Constant	-5.133*** (1.132)	-5.083*** (1.654)	-23.018*** (3.487)	-27.258 (0.000)	-4.923*** (1.399)	-0.724 (1.287)
Observations	5,579	5,579	3,118	1,679	5,579	5,579
Pseudo R-squared	0.108	0.162	0.182	0.289	0.123	0.0498

Notes: Robust standard errors are in parentheses. *, **, *** denote significance at the 10%, 5%, 1% level, respectively. In column (3) Father's Education, Married, Medium Firm and Full Time, in column (4) Married, Urban, Young Child and Large Firm are dropped due to perfect prediction of failure.

Figure 1. Probability of Participation to Adult Education by Years of Schooling

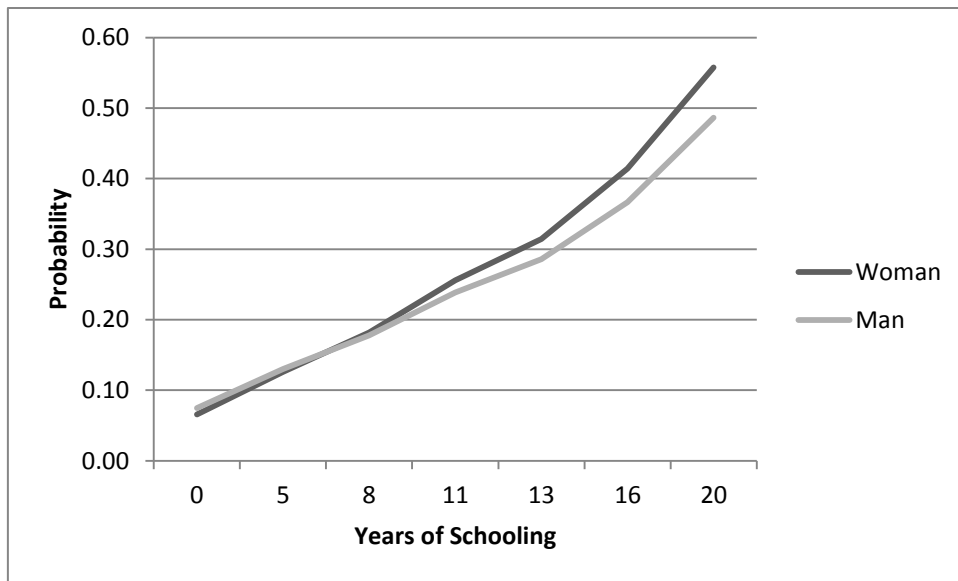


Figure 2. Probability of Participation to Adult Education by VA Growth

