# Kadın Eğitiminin Ekonomik Büyümedeki Rolü: Türkiye Örneği

# The Role of Female Education in Economic Development: A Case For Turkey

**Meltem İNCE***

**ÖZET**

Eğitim, ekonomik gelişimini etkileyen en önemli faktörlerden biridir. Ülkelerin hiçbiri eğitimi görmezden gelerek ekonomik kalkınmayı başaramamaktadır. Eğitim insanların refahı ve yaşam şartlarını bireysel ya da toplumsal olarak sosyal faydalarını arttırarak geliştirmekte, insanların yeteneklerini, becerilerini, yaratıcılıklarını, verimliliklerini, hayal gücünü, bilgilerini ve aynı zamanda teknolojik gelişmeleri artırır. Tüm bu kritik noktalar sonucunda, eğitimin toplumun refah düzeyinin arttırarak Türkiye'de hem sosyal hem de ekonomik ilerleme üzerinde önemli etkisi bulunmaktadır ve karşılaşılan birçok eğitim reformları ile öğrenim gelişimi için gerekli özellikler ve problemler kadın bakış açısıyla incelenmektedir. Bu çalışma insan sermayesi kuramı alanında kısa bir bakış niteliğindedir. Aynı zamanda ekonomik büyüme, GSMH, okuma-yazma, doğurganlık ve kadınların işgücüne katılım üzerinde eğitimin rolü incelenmektedir.

Literatürün eleştirisel bir değerlendirmesinde eğitimin, insan sermayesinin bir belirleyicisi olduğunu ortaya koymuştur. Bu çalışma Türkiye'de yapılan birçok eğitim reformları ile eğitim gelişimi için istenilen özellikleri ve kadınların karşılaştıkları problemleri incelemektedir. İnsan sermayesi kuramı ile birlikte ekonomik kalkınma, GSYIH, okuma-yazma, doğurganlık ve işgücüne katılım oranı üzerinde eğitimin rolünü vurgulamaktadır. Eğitimin insan sermayesinin bir belirleyicisi olduğu Zaman serisi kullanılarak değişkenler yardımıyla açıklanmıştır. Beşeri sermaye olarak eğitimin yaşam standartlarını ve ekonomik büyümeyi Türkiye'de bir toplum olarak nasıl etkilediği konusunda teorik ve ampirik literatüre burada özellikle yer verilmektedir. Yapılan analiz neticesinde kadınların eğitim düzeyi arttıkça, doğurganlık oranının düşeceği ve ekonomik büyümenin artacağı gözlemlenmiştir. Sürdürülebilir ekonomik büyümenin sağlanması için, Türkiye'de kadın eğitimine önem vermek gerekmektedir.

**Anahtar Kelimeler:** Eğitim, Ekonomik Büyüme, Doğurganlık Oranı, KİKO, İşgücü Verimliliği

**Çalışmanın Türü:** Araştırma

**ABSTRACT**

Education is one of the most important fundamental factors that affect economic development. None of the countries can achieve sustainable development by ignoring education. Education improves people's well-being and living standards by rising the social benefits which are utilized either by individuals or as a society, education develops people's talents, skills, creativity, productivity, imagination, knowledge in any branch and also enhances advances in technology. With all those critical points in hand, education has as very important effect on both social and economic progress in Turkey by increasing the welfare of the society. During the twentieth century; education, experience and the acquisition of knowledge have become the basic determinants of a nation's productivity. That is why it is called the "Age of Human Capital" and the determinant of a country's living standards is how well it succeeds in improving the skills and knowledge by educating the majority of its population.

Demand on logical or analytical reasoning or providing technical and characterized knowledge with very simple way of schooling will rise the productivity of labours in high-skilled occupations or make them to have more professional positions. Education itself improves not just the productivity of workers or high-skilled ones, but also increases the productivity of farmers. So the greater the rate of schooling, the greater will be the investment on human capital in the society and the greater the increase in economic growth.

In this respect, investment in Human Capital can be considered as the expenditure on education, skills, talents and career related knowledge which increase as person's adaptability to changing requirements of the economy, develop the quality of human being and increase the income of a person, family and the nation as a whole. So education contributes directly to the growth of national income by improving the productive capacities of the work force.

Because Human capital takes important part in economic literature, the concept of capital has been defined as all monetary and non-substantive economic values to be instrumental in production. In this respect, human capital in general is defined as proper knowledge, skills and all other individual qualifications. This definition also involves education, work experience, learning-by-doing, training and all other activities which people can use their skills more efficiently. All those components fasten economic development by providing rational fulfillment. It can be said that accumulation in human capital provides positive externalities by giving a direct force to measure the productive effects, developing innovation in knowledge and skills, decreasing the cost of transferring information and helping people to find a better position in the work force.

In the process of economic development, another important shift revolves around education, it has a permanent place in economists theory on human capital and modernization progress. Since the private financial return of education is quite substantial. So additional year of schooling will automatically raises the individual's earning power, wealth and life standards. Moreover, society's investment in human beings is a social investment as it is profitable. The fundamental contribution of education on economic growth is to increase the level of skills, talents, konwledge and experience of people to be more enabled in

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the work force. There is a positive feedback from improved education to greater income inequality which yields to a higher rates of economic growth. When education is observed more comprehensively, people earning low income are better able to contrive economic opportunities.

Dollar and Gatti (1999) also examined the relationship between gender inequality in education and growth. They tried to explain five-year growth intervals and attempts to control the possible endogeneity between education and growth using instrumental variable estimation. They found that female secondary education achievement is positively associated with growth, while male secondary achievement is negatively associated with growth. In the full sample, both effects are insignificant, but it turns out that in countries with low female education, female education does not promote economic growth while in countries with higher female education levels, promoting female education has a sizeable and significant positive impact on economic growth.

The formal education system consists of three levels of schooling in Turkey: primary, secondary and tertiary. Primary school provides five years of elementary education while junior secondary and senior secondary school (except technical high schools) takes three years. In August 1997, compulsory education has extended from five to eight years covering junior secondary school. Primary education covers the children aged 6-14 with the new compulsory education system. Before 1997, children were enrolled in primary education at age 6 to 11. From 12 to 14, they were in junior secondary school while between 15 and 17 they went to senior secondary school.

By means of all those progress, there have been considerable improvements in the rate of graduated women working in the labor force since 1980. Considering all the educational levels examined in past 30 years, it is highly significant that the ratio of higher educated women working in the labor force has increased enormously from 7.2 percent to 31.1 percent with showing a raising trend in primary, secondary and senior secondary education. The rate of primary school graduated women working in the labor force was 0.38 percent in 1980 while it has enourmously increased to 95,3 percent in 2009, while the rate of junior secondary school female graduates working in the labor force was 14.07 percent in 1980 while it has shown an increase with 57.04 percent. The rate of senior secondary school graduated women working in the labor force was 9.04 percent in 1980, but it has raised to 21.88 percent (SIS, 2010)

However, the fertility rate is slightly related to countries socio-economic and cultural level of development. Countries with high human capital are acquiring lower level of fertility rates. In Turkey, as in many other developing countries, between the early 1960s and mid'1980s the total fertility rate declined unexpectedly and the country thereby experienced a rapid fertility transition. Also in Turkey, there are low fertility rates in the west and high fertility rates in the east. Because of inadequacy in some social and economic incentives for some provinces in Turkey, the quality of participating in schoolin is still poor and women's educational attainment are low. So illiteracy among women living in those regions is not showing a good framework. It is becuase they are sent to school due to social and cultural norms, traditions and homework duties.

This paper investigates the major issues and problems of females in Turkey and the characteristics required for school improvement with many educational reforms which have to be faced and problems from the perspective of women. It is a brief overview of the field of human capital theory. It also highlights the role of education on economic development, GDP, literacy, fertility and female labor force. A critical evaluation of the literature revealed that education is a determinant of human capital. This is followed by explaining data which were used to construct Time-series with the help of variables provided..

Four equations are used to examine the relationship between the variables. The first equation measures the impact of education, female labor force and Human Development Indicators on economic development (GDP per capita growth). However, these regressors can also be taken into regression separately to measure how each of them affect economic growth one by one. In equation two, only education variables are taken as independent variables, while in equation three, the effect of female labor force by using the impressions of dummy variables are tested. In equation four, the effect of literacy and fertility rates are explored. Special attention is given here to theoretical and empirical literature of how education as human capital affects their living standards and economic development as a society in Turkey where traditional and cultural beliefs are still widespread and having an impact on female education and female labour force participation rates.

**Key words**: Education, Economic Development, Fertility, Labor Productivity, FLFPR
**Types of Study:** Research
**JEL Codes:** I21,J21, J80, O1,O15

## Introduction

Up to the nineteenth century, investment in human capital was not considered as an important tool for people's well-being, production, wealth, economic development or socio-economic circumstances as a whole. In any country, neither households nor government were adequately interested in schooling, training, job-training and education. This started to change with new methods of production techniques, technological improvements and development of new goods and services which needed more educated people. Depending upon the people living in a country, the wealth and prosperity of those slightly related to consistent education and schooling. Hence, since the millennium, education is the most significant factor that increases the socio-economic level of society itself and makes investment in human capital important. Considering all the new developments in technology, communication, information system and adaptations, education becomes more of an issue.

Despite the value of education and its effect on economic growth for improvement, womens' education is stil a serious problem most of whom face inequalities due to gender based situations and also they take opportunity to advantage of education less than men. Social conditioning of gender roles of female children is one of the most eligible reason for not extending their education. By means of investing in education, the position of women in economic, social, cultural and political life increases with regards to the rights, opportunities, self-developments and assurances they are getting. In Turkey, the importance of education has been realised and reforms have been made since the Republic of Turkey was established. Notwithstanding, the overall ratio of education has been the required level, the reforms have accelerated since 2000 inside of the programs done with UNESCO. Considering the countries which have achieved stable economic development in case of considerable investment in education, unequal education between people living in that society will cause an insignificant impact on income distribution. Also, having only education will not be sufficient unless people are not using their acquired knowledge in the sector.

**Education and Economic Development**

The theoretical debate over the conditions and causes of economic growth has shifted negatively in recent years. Arguments rooted in the modernization and human capital perspectives which dominated social science discourse in 1960s and early 1970s, have been sharply attacked and partially supplanted by neo-Marxist conceptualizations rooted in dependency and world-system perspectives. Proponents of the models argued that social structural arrangements like decrease in fertility and mortality rates, mass communication network, increase in political participation and rate of schooling, were necessary for sustained economic development (Apter, 1965; Lerner, 1958; Levy, 1966; Rostow, 1960).

In the process of economic development, another important shift revolves around education, it has a permanent place in economists theory on human capital and modernization progress. Since the private financial return of education is quite substantial. So additional year of schooling will automatically raises the individual's earning power, wealth and life standards. Moreover, society's investment in human beings is a social investment as it is profitable. The fundamental contribution of education on economic growth is to increase the level of skills, talents, konwledge and experience of people to be more enabled in the work force.

Schultz (1961) was the first economist to relate part of the modern economic growth to the changing composition of the labor force by noting the differentials in productivity of the workers by gender, experience and schooling. It was later encouraged by Becker (1975) and Mincer (1958 and 1974) that wage differences among individuals were the result of differences in their rate of schooling, training and work experience.

Demand on logical or analytical reasoning or providing technical and specialized knowledge with a more simple way of schooling will increase the productivity of workers in high-skilled occupations or more professional positions. Education itself enhences even productivity of farmers (Lockheed, Jamison and Lau, 1980). So the greater the rate of schooling, the greater will be the investment on human capital in the society and the greater the increase in economic growth.

As Barro (1998) indicates in his study that the growth rate would be related to the change in human capital and the changes in years of schooling. The changes in capital inputs including human capital determined jointly by economic growth. It is because those variables depend on policy variables and national characteristics including stock of human and physical capital.

**The effect of education on income**

A study suggested that as one percent increase in the labor force with at least secondary education would increase the share of income of the bottom 40% and 60% at the population by between 6% and 15% respectively (Bourguignon and Morrison, 1990). Also increasing education will decrease fertility by reducing the child mortality rates and affecting per capita income growth.

The problem of measuring inequality in terms of income distribution in Turkey shows that it does not fulfill as satisfaction level to a good performance in terms of mortality, death, literacy and illiteracy and fertility rates. From Table 1 it can easily be seen that Turkey performs as well as lower income countries in

terms of life expectancy, fertility rates and similarly in terms of literacy rates. But unfortunately the illiteracy and national poverty line is higher in Turkey compared to other countries. In terms of literacy for both youth female and male, Chile and Poland shows a good performance. Moreover, Turkey is the worst in education index among other countries. That is why the illiteracy rate is so high in Turkey. Indeed, with the exception of the male population, illiteracy rates in Turkey are significantly higher for both middle and upper income countries (World Bank, 2007). By means of Human Development Index 2007, gross enrollment ratio was very low for Turkey as 71,1% and was 105$^{th}$ while primary, secondary and tertiary gross enrollment ratio was even worse (87,6% and 146$^{th}$ over 175).

**Table 1.** Income distribution, Longevity, Mortality, Fertility, Literacy and Illiteracy Rates

| | Brazil | Chile | Malaysia | Mexico | Poland | Romania | Turkey | Venezuela |
|---|---|---|---|---|---|---|---|---|
| **Income distribution** | | | | | | | | |
| GDP per capita, PPP | 9567 | 13800 | 13518 | 14104 | 15987 | 12369 | 12955 | 12156 |
| People living below the national poverty line | 21,5 | 17 | 13,6 | 17,6 | 14,8 | 28,9 | 27 | 18,3 |
| Poverty gap at $2 a day, PPP | 4,2[4] | 0,5[3] | 1,4[2] | 3,3[5] | 0,5 | 0,1[4] | 5,4[3] | 3,2[3] |
| Income share held by highest, 20% | 58,7[4] | 47,8[1] | 44,4[3] | 56,4[5] | 42,4 | 40,3[4] | 47,1[4] | 48,6[4] |
| Income share held by lowest, 20% | 3[4] | 4,1[3] | 6,4[2] | 3,8[5] | 7,3 | 7,9[4] | 5,4[4] | 4,9[3] |
| Female estimated earned income, PPP, $ | 7190 | 8188 | 7972 | 8375 | 11957 | 10053 | 5352 | 7924 |
| Male estimated earned income, PPP, $ | 12006 | 19694 | 18886 | 20107 | 67556 | 14808 | 20441 | 16344 |
| **Longevity, mortality and fertility** | | | | | | | | |
| Life expectancy at birth, total (years) | 76 | 82 | 77 | 78 | 80 | 77 | 74 | 77 |
| Life expectancy at birth, female (years) | 75,9 | 81,6 | 76,6 | 78,5 | 79,7 | 76,1 | 74,2 | 76,7 |
| Life expectancy at birth,male (years) | 68,6 | 75,5 | 71,9 | 73,6 | 71,3 | 69 | 69,4 | 70,7 |
| Mortality rate, infant (per 1000 live births) | 22,6 | 7,71 | 15,9 | 18,4 | 6,8 | 22,3 | 25,8 | 21,5 |
| Mortality rate,under-5(per 1000 live births) | 22 | 8,7 | 6,4 | 17 | 6,9 | 14 | 22 | 18 |
| Fertility rate, total (births per women) | 1,9 | 1,9 | 2,6 | 2,1 | 1,4 | 1,4 | 2,1 | 2,5 |
| Death rate, crude (per 1000 people) | 6,4 | 5,8 | 5 | 4,8 | 10 | 11,9 | 6,1 | 5,1 |
| **Literacy and illiteracy rates** | | | | | | | | |
| Education index | 89,1 | 91,9 | 85,1 | 88,6 | 95,2 | 91,5 | 82,8 | 92,1 |
| Literacy rate, adult total (% of people ages 15 or above) | 90 | 98,6 | 92,1 | 92,9 | 99,5 | 92,6 | 88,7 | 95,2 |
| Literacy rate, adult female (% of people ages 15 or above) | 90,2 | 96,5 | 89,6 | 91,4 | 99 | 96,9 | 81,3 | 94,9 |
| Literacy rate, adult male (% of people ages 15 or above) | 89,8 | 96,6 | 94,2 | 94,4 | 99,6 | 98,3 | 96,2 | 95,4 |
| Literacy rate, youth total (% of people ages 15-24) | 99,2 | 97,8 | 98,4 | 98,4 | 99,8 | 97,3 | 96,4 | 98,4 |
| Literacy rate, youth female (% of people ages 15-24) | 98,6 | 99,2 | 98,5 | 98,4 | 99,9 | 97,5 | 94,3 | 98,8 |
| Literacy rate, youth male (% of people ages 15-24) | 97,1 | 99,1 | 98,3 | 98,4 | 99,8 | 97,1 | 98,6 | 98 |
| Illiteracy rate, adult total (% of people ages 15 or above) | 3,5 | 10 | 8,1 | 7,2 | 0,7 | 2,4 | 11,3 | 4,8 |

Source: Human Development Report and Human Development Index,2009; World Bank, 2009.
Note: [1]2004 [2]2005 [3]2006 [4]2007 [5]2008

**The effect of education on the fertility rate**

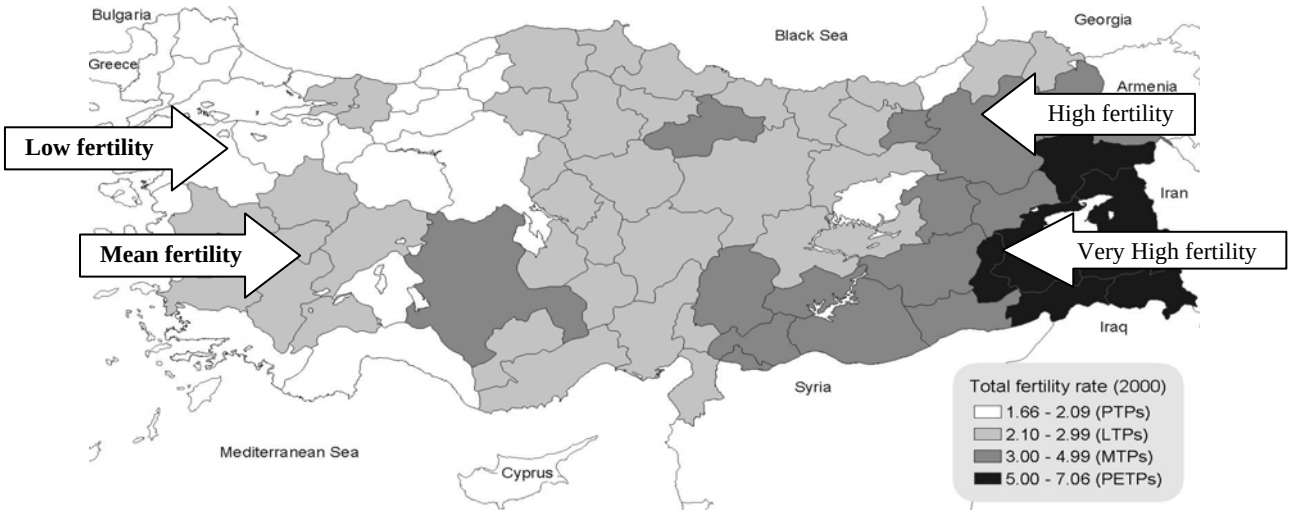
The relationship between women's education and fertility can be evaluated in affecting economic development. Most economists believe that rapid population growth has a negative impact on economic development (Coale and Hoover, 1958). Indeed, educational expansion reduces population growth by rising the age of entry in at first marriage, reducing the demand for children, increasing knowledge and use of birth control methods (Cochrane, 1979). Therefore, increasing education level will decrease population growth by reducing birth. So education has an important role by decreasing social factors like fertility for a sustainable economic growth.

Barro (1991) pointed out that well educated families preferred to produce more goods and services as being more abundant instead of having more children. Correspondingly it can be addressed that there was a negative relationship between education and the fertility rate. For Becker and Barro (1985), there was a negative relationship between the number of children and Human capital per child which would yield an insignificant correlation between economic growth and growth in population.

Despite female education having an effect on: (a) desired family size, (b) the relationship between desired family size and planned number of births, and (c) women's ability to achieve as planned number of births. Female education can be expected to reduce desired family size for a number of reasons. First of all, education raises the opportunity cost of women's time and, generally opens up greater opportunities for women that often conflict with repeated child-bearing. This may lead educated women to want fewer children (Leibenstein,1957; Becker, 1960; Schultz, 1975; Rosenzweig and Stark, 1997). It enhances women's choices in the matter of family formation. Even in societies where marriage is a poor indicator of

the onset of sexual activity, better educated women are older when they have their first child. A later transition to motherhood is likely to have an influence on family size, because better educated women consistently want smaller families. Educated women also may have higher aspirations for their children, combined with lower expectations of them in terms of labour services. This may reduce desired family size, especially if there is a trade-off between the number of children and the time available for each child (UN, 1993). Educated women are more open-minded, self-confident and receptive that they can easily adapt to the new norms and conditions. So women better equipped with Human capital are in less risky situations than less educated women cause of having better job skills.

As figure 1 shows the greater the education level of women, the lower the fertility rate. There are 4 types of fertility rates in Turkey: (i) low fertility rate for post-transitional province, (ii) mean fertility for late-transitional province, (iii) high fertility for mid-transitional province and (iv) very high fertility for pre-or early transitional province. With these information, women become more educated, their wish to have numerous children declines




Source: TUIK, 2000.

**Figure 1.** Distribution of post, late, mid and pre- transitional provinces in Turkey, 2000

**The effect of education on female labor force participation**

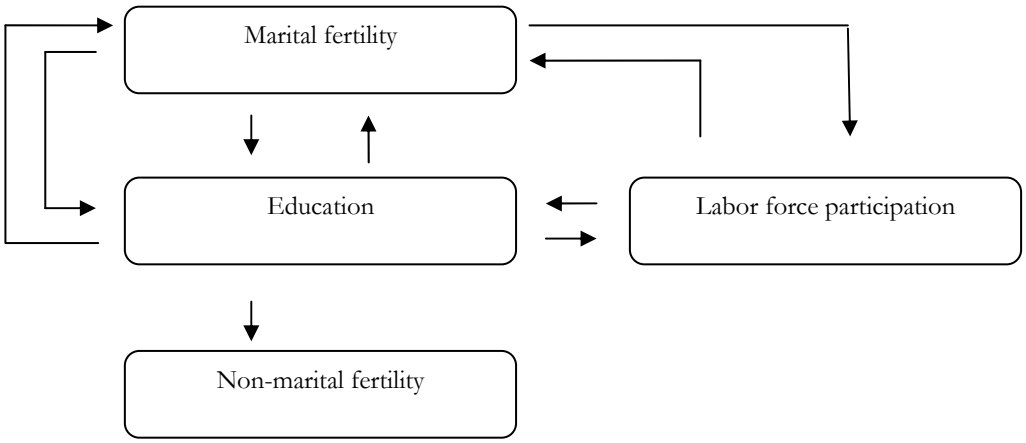
Many economic and sociological theories predict that education increases women's participation in the labor force. It is because it affects women's willingness and ability to enter the labor market. To specifiy the impacts: the increased schooling of females (i) increases their earning power and encourages them in seeking employment, (ii) increases their occupational requirements, (iii) changes people's attitudes towards women's traditional roles in the labor market, (iv) provides them the reference they need for many jobs in the market (Ram, 1982; Standing, 1981).

Many economists have identified that the recent decline in labor force participation rates of women has been concentrated among highly educated women with young children (Goldin 2006, Bradbury and Katz 2005). Others have identified both characteristics and behavior (Reimers & Stone 2007 and Hotchkiss, 2006), as well as strength of the labor market (Boushey, 2005). Of cource, having a child has been found to have a profound impact on the decision of women to exit the labor market, even among very highly educated women (Herr and Wolfram 2009).

There is a well-established relationship between labor force participation decisions and the strength of the labor market (Hotchkiss and Robertson 2006). Strong labor markets increase the opportunity cost of being absent and decrease the probability of exiting to the labor force (Hotchkiss, J.L and et.all, 2010).

As seen from the Figure below, education can affect fertility both by marital fertility and from other points like marital fertility. Marital fertility can affect marriage duration, labor force participation and human capital. So it can be said that education can be in part endogenous: strong preferences for market

work may induce women to invest in education more and lower fertility. But this decrease in fertility may cause a problem of labor shortage in the future (Lillard and Waite,1995).




Source: Smith, 1997.

**Figure 2.** Women's education, fertility and labor force participation

In Turkey, the rate of return on investment in education is actually lower for women than males. But as the education level of females raises, fertility rate starts to decrease in the western parts of Turkey while it has an opposite effect in eastern parts. The majority of economically inactive females are housewives and the percentage is given as more than 80% (UNDP, 2001). Therefore, it can be argued that women actively participate in economic life in Turkey, but mostly as an unpaid family worker.

**Educational Attainment in Turkey**

Gender differences in literacy (80,6% for women as opposed to 93,9% for men according to the 2000 census) and current school enrollment rates (91,8% for girls and 100% for boys at the primary level) show inequality in access to education. Gender differences are greater in rural areas than in urban areas. Regarding women in urban areas, 16,6% cannot read or write and as much as 30,8% of their rural counterparts are illiterate while only 3,9% of urban and 9% of rural men are illiterate. Migration from the eastern to western regions, usually from rural to urban settlements, is still common in Turkey so the problem of female illiteracy is carried to towns. Large numbers of rural migrants settle in squatter areas or areas known as "*gecekondu"* quarters of many Turkish cities. Consequently female illiteracy and lack of access to education constitutes a serious problem in these areas (State Institute of Statistics, 2003).

Regional distribution of female illiteracy is another point which deserves attention: illiteracy rates show a decline from the Southeast to Northwestern region. The most striking illiteracy rate is observed in the Southeast where 39% of women are illiterate, followed by the East and Black Sea regions where rates are 35% and 21% respectively. (The Ministry of National Education,2003).

Literacy rates for the female population have also increased in the last 30 years. It was 24 percent in 1970 while it has increased to 80.4 percent in 2009. It has shown the same trend in higher education. A higher percentage of the female (43,1) population choose to continue their education in universities compared to the previous 30 years. On the other hand, adult female illiteracy rate declined from 61 percent in 1970 to 11,3 percent in 2009. Nevertheless, by the eight years primary in education, youth female illeteracy rate is expected to decrease below 2 percent while it is 5.14 percent now. In addition, fertility rates which are taken as a human capital measurement have decreased from 5 percent in 1970 to 2,1 percent in 2009[1].

[1] Datas from UNDP, *Human Development Report*, New York: Oxford University Press, 1999; 2004.

**Table 2:** Female Labor Force and Human Development Indicators for Turkey, 1980-2009

| Years | GDP/capita growth rate (%) | Labor Force (%) | School Enrollment | | | | literacy rate adult female (%) | Fertility rate (%) |
|---|---|---|---|---|---|---|---|---|
| | | | Primary (%) | Secondary (%) | Tertiary (%) | Higher Education (%) | | |
| **1980** | -4,6 | 35,5 | 0,38 | 14,07 | 9,04 | 7,2 | 35 | 4,26 |
| **1981** | 2,41 | 35,41 | 0,41 | 15,43 | 10,1 | 7,6 | 38,1 | 4,18 |
| **1982** | 1,02 | 35,32 | 0,53 | 15,79 | 9,82 | 8,1 | 42,6 | 4,1 |
| **1983** | 2,39 | 35,23 | 0,68 | 16,15 | 11,6 | 8,3 | 43,9 | 4 |
| **1984** | 4,09 | 35,14 | 0,61 | 16,84 | 14,9 | 8,8 | 45,1 | 3,85 |
| **1985** | 1,74 | 35,05 | 0,52 | 17,93 | 14,1 | 9,37 | 47,7 | 3,79 |
| **1986** | 4,61 | 34,96 | 0,57 | 18,05 | 13,7 | 9,62 | 51,9 | 3,66 |
| **1987** | 7,13 | 34,87 | 0,51 | 17,75 | 13,9 | 11,06 | 53,4 | 3,53 |
| **1988** | -0,07 | 34,78 | 0,6 | 19,52 | 14,62 | 12 | 56,5 | 3,4 |
| **1989** | -1,9 | 34,69 | 0,66 | 20,47 | 14,79 | 10,7 | 59 | 3,2 |
| **1990** | 6,82 | 34,6 | 88,7 | 20,59 | 15,38 | 13,4 | 67,4 | 3 |
| **1991** | -1,03 | 34,9 | 89,41 | 22,31 | 15,64 | 12,2 | 68,9 | 2,96 |
| **1992** | 3,97 | 35,2 | 87,83 | 24,56 | 15,44 | 11,3 | 72 | 2,92 |
| **1993** | 6,01 | 35,5 | 87,92 | 28,86 | 15,87 | 16,4 | 76,7 | 2,88 |
| **1994** | -7,2 | 35,8 | 87,28 | 30,89 | 16,18 | 14,9 | 75,6 | 2,84 |
| **1995** | 5,24 | 36,1 | 86,79 | 33,21 | 16,23 | 13,1 | 76,6 | 2,8 |
| **1996** | 5,07 | 36,4 | 86,92 | 33,78 | 16,71 | 13,4 | 76,3 | 2,76 |
| **1997** | 5,61 | 28,8 | 78,97 | 34,16 | 16,82 | 13,9 | 76,9 | 2,5 |
| **1998** | 3,1 | 29,3 | 83,79 | 35,22 | 17,79 | 15,2 | 77,6 | 2,5 |
| **1999** | -4,7 | 30 | 88,45 | 36,52 | 17,25 | 15,4 | 78,1 | 2,4 |
| **2000** | 7,4 | 26,6 | 90,79 | 39,18 | 17,67 | 14,02 | 78,3 | 2,4 |
| **2001** | -5,7 | 27,1 | 88,45 | 42,97 | 17,99 | 18,79 | 78,2 | 2,3 |
| **2002** | 6,24 | 27,9 | 87,34 | 45,16 | 18,5 | 19,99 | 79,9 | 2,3 |
| **2003** | 5,3 | 26,6 | 86,89 | 48,43 | 18,84 | 23,04 | 81,1 | 2,3 |
| **2004** | 9,4 | 25,4 | 86,63 | 50,51 | 18,9 | 23,88 | 79,6 | 2,2 |
| **2005** | 8,4 | 24,8 | 87,16 | 51,95 | 18,96 | 25,97 | 80,3 | 2,2 |
| **2006** | 6,9 | 24,9 | 87,93 | 52,16 | 19,05 | 26,84 | 80,4 | 2,2 |
| **2007** | 4,7 | 26,38 | 90,1 | 53,62 | 19,63 | 28,05 | 74,2 | 2,3 |
| **2008** | 1,1 | 26,89 | 92,1 | 56,31 | 21,72 | 29,77 | 79,6 | 2,1 |
| **2009** | -5,8 | 27,16 | 95,3 | 57,04 | 21,88 | 31,06 | 80,4 | 2,2 |

**Source:** Republic of Turkey, State Institute of Statistics-Population and Development Indicators and State Planning Organization, 2007; World Bank, 2009 and UNDP 1999; 2009.

**Research design and Data**

The research reported in this article followed a comparative, time-series research design. A number of regressors are included in this study. The model is re-estimated by using Time-Series. The purpose of this econometric estimation is to focus on the measure of gender inequality in education and its derivatives which are excepted as human capital. Per capita GDP of Turkey was used to measure changes in levels of economic development over time. GDP per capita growth rate is the dependent variable, while the literacy rate (lr), school enrollments as primary (pr), secondary (sr), tertiary (tr), higher education (hr), fertility rate (fr), female labor force participation rate (flfpr) and dummy variables used to prohibit the particular effects are explanatory variables. 1980 – 2009 period data were used to construct Time-Series with the help of variables provided in Table 2. The following equations are estimated:

$$\Delta GDP_{i,t} = \gamma_1 \Delta lr_{i,t} + \gamma_2 \Delta pr_{i,t} + \gamma_3 \Delta sr_{i,t} + \gamma_4 \Delta tr_{i,t} + \gamma_5 \Delta hr_{i,t} + \gamma_5 \Delta fr_{i,t} + \gamma_6 \Delta flfpr_{i,t} + \gamma_7 \Delta D_1 + \gamma_8 \Delta D_2 + \gamma_9 \Delta D_3 + \gamma_{10} \Delta D_4$$

$$\Delta GDP_{i,t} = \gamma_1 \Delta lr_{i,t} + \gamma_2 \Delta pr_{i,t} + \gamma_3 \Delta sr_{i,t} + \gamma_4 \Delta tr_{i,t} + \gamma_5 \Delta hr_{i,t}$$

$$\Delta GDP_{i,t} = \gamma_1 \Delta flfpr_{i,t} + \gamma_2 \Delta D_1 + \gamma_3 \Delta D_2 + \gamma_4 \Delta D_3 + \gamma_5 \Delta D_4$$

$$\Delta GDP_{i,t} = \gamma_1 \Delta lr_{i,t} + \gamma_2 \Delta fr_{i,t}$$

gdp: GDP/capita growth rate
flfpr: Change in the rate of female in working population, 1980 – 2009
pr: Change in the rate of graduated females from primary education
sr: Change in the rate of graduated females from secondary education
tr: Change in the rate of graduated females from tertiary education
he: Change in the rate of graduated females from higher education
lr: Change in adult female literacy rate as percentage
fr: Change in total fertility rate (percentage of children)
$D_1$: The war in 1991
$D_2$: Financial crises that were occurred in 1994 and 2001
$D_3$: The Marmara earthquake in 1999
$D_4$: The global financial crisis occurred in 2008

First differences of all variables are put into the regression. The reason for this is that there are some variables which are non-stationary. That means, they can not influence their properties and have stochastic trends which are determined by changes that can easily be explained by the model. Therefore, to prohibit these differences between stationary and non-stationary variables, first differences of all variables are taken. Otherwise, this model will tend to show a linear relationship but it will not be real.

The data that have been used in the empirical part of this paper come from different data sets given below:

- World Bank, 1980 – 2009.
- World Development Indicators (WDI 2009).
- State Planning Organization.
- State Institute of Statistics.
- UNDP,1990 – 2009.
- LABORSTA, ILO Bureau of Statistics.
- General Directorate of Population and Citizenship Affairs, 2009

In addition to school enrollment rates taken from UNDP (2009) and State Institute of Statistics (2008), the other four variables were employed in the analysis: Per capita GDP growth rate, some parts of literacy and fertility rates come from World Development Indicators, World Bank and General Directorate of Population and Citizenship Affairs while ratio of women's participation in the labor force is taken from International Labor Office.

**Estimation results**

The explanatory variables defined in the previous section have been regressed using Time-Series and the results are provided in Table 3.

**Table 3.** Estimation results of Time-series

| Dependent Variable | Constant | LR | PR | SR | TR | HE | FR | FLFPR | D1 | D2 | D3 | D4 | $R^2$<br>Adj. $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GDP** | 1,62 | 0,15 | -0,12 | 2,6 | 0,56 | 1,57 | -4,01 | 0,27 | -13,15 | -16,6 | 9,83 | 9,18 | 0.765 |
| | 0,78 | 2,25 | (-1,82) | 2,4 | 1,98 | 2,35 | (-2,21) | 1,99 | (-2,48) | (-3,71) | (-2,03) | (-1,98) | 0.459 |
| **GDP** | -1,26 | 0,48 | 0,08 | 1,57 | 1,06 | 1,16 | | | | | | | 0,91 |
| | (-0,53) | 1,98 | 0,93 | 1,96 | 1,99 | 2,12 | | | | | | | 0.78 |
| **GDP** | 0,72 | | | | | | | 1,29 | -9,48 | -14,78 | -9,32 | -5,17 | 0.46 |
| | 1,51 | | | | | | | 2,45 | (-1,98) | (-3,67) | (-2,07) | (-2,03) | 0,34 |
| **GDP** | -0,56 | 0,79 | | | | | -8,12 | | | | | | 0,17 |
| | (-0,34) | 1,99 | | | | | (-2,58) | | | | | | 0,08 |

Table 3 shows the basic regression equations (1) through (4) as described above. Most regressions have shown the expected signs, a high explanatory power and perform well on specification tests. The indicators used in the analysis are: GDP per capita growth rate, the literacy rate (lr), school enrollments as primary (pr), secondary (sr), tertiary (tr), higher education (hr), fertility rate (fr), female labor force participation rate (flfpr) and dummy variables which are used to prohibit the particular effects.

Equation (1) confirms a number of known findings regarding the importance of initial levels of human capital (SE, TE and HE) as well as fertility, primary education and female labor force participation rates. There is a negative impact of fertility on economic development while there is a positive impact of education levels and female labor force participation (based on t-values). All of the dummy variables for the various events are significant.

Another interesting thing in this equation (1) is the finding that both the ratio of graduation from secondary (SR) and tertiary school (TR) as well as higher education (HE) has a significant positive impact on economic growth while primary education (PR) has the opposite effect. Indeed, female labor force improvement is positively associated with education. The coefficients of the graduated from the different levels of educations are on the expected way. Only an increase in primary education will decrease GDP growth as expected. On the other hand, only t-value for graduated females from primary education is insignificant (1.82). That means, when the education level of females increase, they start to get as larger share in the labor force which yields more economic growth as increasing wealth in the country. By the way, the female labor force participation rate has a high explanatory power on GDP as it is expected. A 1% increase in the ratio of flfpr will raise the GDP growth by about 0,3%. Empirically, female labor force also appears to be related to the health. When the fertility rate is included in the regressions, the direct effects of the fertility rate on GDP become bigger as showing a decrease and expected sign; the coefficients on fertility rate is in the right direction, and significant. Meanwhile, the coefficient of literacy rate on GDP has a positive impact (0,15%) and in the right direction and significance. It means as the literacy of women increases, their position in the labor force increases which causes GDP growth to raise. Since education of women also has to be increased to get a better job or to be in the labor force and to compete with men[2], dummy variables which are put into the regression are used to prohibit the particular effects of the defaults like 1991 war in Iraq, 1994 and 2001 financial crisis, 1999 Marmara earthquake and 2008 Global Financial crisis. Every 1% raise in dummy variables decreases GDP growth rate. In developing countries like Turkey with low female education, economic growth does not significantly enhance education or vice versa. Of course, there are other factors like; with a high growth rate in family

[2] It is also proved with the variable of higher education. As the education of women increase, they start to find jobs or better location according to their education level. The variable of literacy is not only enough to raise women`s position in the labor force.

income, they do not want to work or it can be said that they work but as unpaid family workers. As a result, it can be concluded that a raise in school enrollments makes improvements in female labor force participation by forcing them to have a bigger share in the sector and increase the economic growth of the country as a whole. On the other hand, there is a strong relationship between dummy variables and GDP growth. The effect of the war in 1991 on GDP is small ($\delta_1$=-13.15) and insignificant ($|t|$=-2.48<1.96) while other dummy variables also have high shares in the effect of GDP growth rate ($\delta_2$=-16.6, $\delta_3$=-9.83 and $\delta_4$= -9.18) and also insignificant ($|t|$=-3.71<1.96, $|t|$= -2.03 <1.96 and $|t|$= -1.98 <1.96) effects economic growth.

Equation 2 shows the reduced form estimate of the determinants of education and shows that higher education is related to higher female labor force growth and higher human capital with more impact on GDP. Comparisons between equations (1) and (2) indicate that the effects of education are indeed sizeable as the significance of all coefficients except primary education. In addition, reducing gender inequality in the labor force will lead to higher education levels. In particular, GDP growth appears to be positively affected by education. Due to this, education is one of the most important variable for women for raising their position in the labor force and to gain more from the economic development by eliminating the gender inequality they are facing. According to the regression, all the signs of the coefficients of the equation are on the expected direction and t-values of them are statistically significant with a very high $R^2$ ( 91%) except primary and secondary education. That means, expenditure on human capital is very important and it will return to women as a better jobs, better payments and better positions in prospect with a higher return on economic growth.

Equation 3 also shows that female labor force participation rate has the expected impact so that an increase in flfpr will increase growth of people but it can not be concluded that it has an overwhelming effect on GDP because putting only flfpr with dummy variables into regression is meaningless and express nothing although it has a significant impression.

In equation 4, only literacy and fertility rates are added to determine their effect on GDP growth. Both of them are showing positive and significant signs. This result may be expressed with some caution such as greater access to literacy for females and the lower the fertility, the higher the increase in economic growth.

**Conclusion**

Using Time-Series regression, this paper empirically concentrates on the effects of the level of education, fertility rate and other human development indicator as well as flfpr on GDP growth. Seven indicators are used to run the regression. The results indicate that the level of education exerts a statistically significant positive effect on women in the society. There is an increasing trend in the labor force participation of females who graduated from higher education. This means that an additional year of female schooling raises the female labor force participation rate which leads to a raise to GDP. It is also found that the level of education among the population in Turkey has an important effect on improving gender equality in the labor force. On the other hand, now still, so many women are not permitted to go to the school or carry on their education in the Eastern and Southeastern parts of Turkey, because they have to work on the lands that their families' own, they use them as unpaid family workers or have to help their families at home. Due to this, it will have a negative impact on economic growth.

Secondly, education as a human capital indicator, education is not affecting GDP in the short time like one year because there has been time lags between starting education, graduating, finding a job, earning salary and increasing wealth. But if it is viewed in the long-run, nearly half of the change in GDP arises from education.

In summary, existing evidence indicates that improving the level of education of females will lead to lower fertility and higher economic development. In addition to this, the combination of all of these variables will lead to as better positions of women in the society with higher wealth. As a result, there is a positive correlation between female education and economic development in Turkey. To have sustainable economic growth, it is also necessary to give great importance to education of female in Turkey.

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