

## Educational Inequality in Turkey: An Evaluation by Gini Index\*

### Türkiye’de Eğitim Eşitsizliği: Gini İndeksine Göre Değerlendirme

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#### *Abstract*

This study aims to determine the relationship between educational inequality and the average year of schooling in Turkey. The data was the content of the 2000 General Census of Population: Social and Economic Characteristics of Population. To determine inequalities in education, average year of schooling of 25 year olds and above and the education Gini index were calculated. Average year of schooling in Turkey in all regions increased during the period of 1975–2000 while inequality in education decreased. A negative relationship was found between average year of schooling and educational Gini index. A positive relationship was found between the rates of increase in average year of schooling and decrease in the education Gini index.

*Keywords:* educational attainment; educational inequality; gender inequality; educational distribution; average year of schooling

#### *Öz*

Bu çalışma, Türkiye’de eğitim eşitsizliği ile ortalama öğrenim süresi arasındaki ilişkiyi belirlemeyi amaçlamaktadır. Veriler Türkiye’de 2000 Genel Nüfus Sayımı Nüfusun Sosyal ve Ekonomik Nitelikleri kaynağından alınmıştır. Eğitim eşitsizliklerini belirlemek için 25 ve daha yukarı yaştaki nüfusun ortalama öğrenim süresi ve Eğitim Gini İndeksi hesaplanmıştır. Türkiye’de ve bütün bölgelerde 1975–2000 döneminde ortalama öğrenim süresi artmış, eğitim eşitsizliği ise azalmıştır. Ortalama öğrenim süreleri ile Eğitim Gini İndeksi arasında negatif bir ilişkinin olduğu belirlenmiştir. Ortalama öğrenim sürelerindeki artış ile Eğitim Gini İndeksi azalma oranları arasında pozitif bir ilişki olduğu belirlenmiştir.

*Anahtar Sözcükler:* Eğitime erişim, eğitim eşitsizliği, cinsiyet eşitsizliği, eğitimsel dağılım, ortalama öğrenim süresi

#### Introduction

One of the most important criteria of success in education is “equality in opportunity and facility” that is presented to society. Equality in success and access are two fundamental scales of equality of “opportunity and facility in education”. Equality in success reflects the qualitative aspect of opportunity. Equality in access, on the other hand, reflects quantitative aspects of opportunity equality (Ferreira, Gignoux & Aran, 2010). Access to education is outlined with school enrollment rates and average schooling year of adults within the process of education.

Education gained a key role in progress with the tendency towards development based on human rights and knowledge-based economy. It is accepted that individuals who take much longer and more qualified education gain higher income as they care about their health conditions while expecting a longer life (OECD, 2008; Tansel, 2004). With the realization of the central role of education in social and economic development, improvements in the quality and quantity of education and provision of equality in opportunity and access to education have become primary

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issues on countries' political agendas (Tomul, 2008). Education is one of the most important means of distributing economic welfare and opportunities to the entire society. Providing equal opportunities in education facilitates the vertical mobility, and social and economic movement of the poor sections in the society. Inequalities in education are also another source of social and economic inequalities. Equality in education is an essential principle to make everyone realize his individual potential and to make them able to undertake constructive roles in their social lives. If equality is not obtained in education, it could become a tool of supporting and enhancing the inequalities in society more than being a tool for social movements. Educational level and distribution have an important impact on such social consequences as child death, birth rates, children's education and distribution of income (Becker, 2007; Barro and Lee, 2000; Frankema and Bolt, 2004; Gregorio and Lee, 1999; Loyel and Hewell, 2004; Ram, 1990; Qian and Smyth, 2005). One of the significant issues of development is gender difference in educational distribution (Siddhanta and Nandy, 2003). In developing countries, high level of inequality in access to education between men and women is an important threat to development. Education of women is not only a basic human right, but it is also vital to accelerate human development and economic growth (Klasen, 2002; Oxfam, 2000; Siddhanta and Nandy, 2003). Deep-rooted cultural, institutional and political obstacles act as factors to create and perpetuate gender differences in access to education (Shabaya and Konadu-Agyemang, 2004).

Improvement in education is not only related to the increase in average values, but also to the level of distribution. Because the role of education in social, political and economic development has been realized, attention has been drawn to the issues of equality of education in recent years (Costell and Domenech, 2002; Mesa, 2005; Qian and Smyth, 2005; Thomas et al., 2001). Indicators that are used in the determination of distribution of level of education to individuals in a society based on gender, residential units and income groups are literacy rates, school enrolment rates, average year of schooling, standard deviation, Generalized Entropy, Gini index and Theil index (Mesa, 2005; Siddhanta and Nandy, 2003; Thomas et al., 2000; Thomas et al., 2001). In the initial studies to determine inequality in education, the technique of standard deviation was used. However, it was stated that standard deviation values provide distribution only as a form, and that it does not yield information about the level of inequality. To determine the level of inequality in education, the Gini index has started to be used frequently in recent years. The Gini index of education (Education Gini Index) ( $E_{GI}$ ) is calculated with the help of data related to school enrollment, financing education or the years of schooling. However, in recent studies, EGI has been calculated mainly based on the average year of schooling (Thomas et al., 2001). Average year of schooling is an important distinguishing indicator of developmental differences in education. However, "education period" denotes an average value. It cannot yield sufficient information about the distribution of level of education to a population (Tomul, 2005, 2007). Education Gini index could be used to complement other indicators for well-being, in particular, indicators of access, average levels, and the quality of education (Thomas et al., 2001)..

Though there is massive and detailed accounts in literature on different variations of distribution, applications on educational area are quite limited. Gini index is accepted to be an important scale in defining inequalities. One of the important scales is Gini index in defining economical inequalities which has started to be used in defining educational inequalities.

In the studies conducted, there is a U shaped curvilinear relationship between average year of schooling (AYS) and inequality in education. At the beginning, with the increase of average year of schooling, inequality in education also increases, but beyond a certain point in the increase in the AYS value, the inequality in education tends to fall. Ram (1990) Pscharopoulos and Arriagada (1986) tried to determine the interaction between growth in education and inequality in education using the results of their study. To measure the inequality in education, they calculated the Standard deviation in the distribution of education for each observation. According to the study, there is a strong curvilinear relationship between average year of education and inequality in education. When years of education reaches about 6.8 years, inequality increases, and beyond this point, inequality in

education tends to decrease. This result shows similarity to the Kuznets Curve (U). Similarly, Thomas et al. (2001) determined in their study that there was a U shaped relationship between average year of education and Standard deviation. According to this study, the standard deviation values increase until the average year of education reaches 8 years, and after 8 years, Standard deviation values start to decrease, and when the average year of education is 16, it reaches zero value. However, Kuznets curve in education exists only when standard deviation is used as an inequality measure, which is not a good measure of inequality (Thomas et al. 2001). Checchi (2001) states that there is a negative relationship between average year of schooling and distribution. The researcher states that a downward turn occurs after about 6.5 years in this relationship.

Shan and Younger (2005), who used the international level General Entropy indicator, found that equality in income is higher at the international level while inequality in education is higher at the national level.

Thomas et al (2001) calculated education indexes using the data related to the education levels in 85 countries between 1960 and 1990. According to this study, between 1960 and 1990, inequality in education decreased in many countries. One of the most important findings of this study is that a negative relationship was found between the average year of schooling and EGI.

Zahang and Li (2002) Barro and Lee (1996) calculated the Gini index to determine the inequality in education on the international scale using the average year of schooling data that they calculated for the years between 1960 and 1990. According to the results of the study, between 1960 and 1990, although there was an increase in the level of education in general, the difference between the years of schooling in the developed and developing countries increased. In this period, the difference in the years of schooling between men and women also increased.

Erdem and Çoban (2005) calculated inequality in education at the province level in Turkey between 1980 and 2000. In this calculation, they employed Thomas et al.'s (2001) education Gini coefficient calculation method. Thomas et al. (2000) included all stages of education in the calculation of the education Gini coefficient. However, in the calculation that Erdem and Çoban (2005) used in their study, they did not include the values of the graduates of higher education in the population. This is also an important deficiency in the calculation of inequality. Additionally, in the study, the average year of schooling were not presented.

Tansel and Güngör (2000) used the school enrollment rates in provinces in the period between 1980 and 1994 to calculate the inequality index between provinces in Turkey. Tansel and Güngör established that per capita income and the degree of being rural are important factors in determining inequality in school enrollment between provinces.

This study aims to determine the relationship between educational inequality and the average year of schooling in Turkey. In the light of this general purpose, the average year of schooling (AYS) and education Gini index (EGI) was calculated with respect to regions and gender in Turkey. In addition, the study also aimed to determine the relationship between average year of schooling and the variations in these years and education Gini index, and the variation in education Gini index.

## Methods

### *Data*

The raw data of this study was obtained from the tables of the census of population pertaining to the period between 1975 and 2000 (population 25 years of age and over) which is within Table 3.9 titled Population by literacy, education level presented in the tables within the source used in this study: 2000 Census of Population -Social and economic characteristics of population *by provinces in Turkey*. The data in the study were analyzed according to the II. Level statistical regions determined by the State Institute of Statistics (DIE, 1978, 2002). The DIE classifies Turkey into 26

second level statistical regions. These can be listed as Adana (Adana, İçel), Antalya (Antalya, Burdur, Isparta), Hatay (Hatay, Kahramanmaraş, Osmaniye), Ankara (Ankara), Konya (Konya, Karaman), Kastamonu (Kastamonu, Çankırı, Sinop), Samsun (Samsun, Amasya, Çorum, Tokat), Zonguldak (Zonguldak, Karabük, Bartın), Balıkesir (Balıkesir, Çanakkale) Tekirdağ (Tekirdağ, Kırklareli, Edirne), Trabzon (Trabzon, Rize, Ordu, Gümüşhane, Giresun, Artvin), Bursa (Bursa, Bilecik, Eskişehir), Kocaeli (Kocaeli, Düzce, Bolu, Sakarya, Yalova) Aydın (Aydın, Denizli, Muğla), Manisa (Manisa, Afyon, Kütahya, Uşak), İzmir (İzmir), Gaziantep (Gaziantep, Adıyaman, Kilis), Mardin (Mardin, Batman, Siirt, Şırnak), Şanlıurfa, (Şanlıurfa, Diyarbakır), Ağrı (Ağrı, Ardahan, Iğdır, Kars), Erzurum, (Erzurum, Bayburt, Erzincan), Kayseri (Kayseri, Sivas, Yozgat), Kırıkkale (Kırıkkale, Aksaray, Kırşehir, Nevşehir, Niğde), Malatya (Malatya, Bingöl, Elazığ, Tunceli), Van, (Van, Bitlis, Hakkâri, Muş), İstanbul (İstanbul) regions (DİE, 2006). The  $E_{GI}$  and  $E_{CI}$  values of those in the population who are at and above the age of 25 were used in the calculation.

#### *Education Gini Index*

Educational inequality was determined through the Gini index. The education Gini index was calculated based on average year of schooling. In this study, the education Gini index (EGI), developed by Thomas et al. (2001), was used to determine inequalities in education. The education Gini coefficient has a value that varies between 0, indicating perfect education equality and 1, indicating perfect education inequality.

Following Thomas et al. (2001), the  $E_{GI}$  formula for the direct method is as follows (1):

$$(1) E_{GI} = \left(\frac{1}{\mu}\right) \sum_{i=2}^n \sum_{j=1}^{i-1} p_i |y_i - y_j| p_j$$

Where;

$E_{GI}$  is the education Gini index based on educational attainment distribution;

$\mu$  is the average year of schooling for the concerned population;

$p_i$  and  $p_j$  stand for the proportions of population with certain levels of schooling;

$y_i$  and  $y_j$  are the years of schooling at different educational attainment levels;

$n$ ; is the number of levels/categories in attainment data, and  $n = 6$  in this study.

The detailed process of the education Gini ( $E_{GI}$ ) formula is as follows (Thomas et al., 2001).

$$\begin{aligned} E_{GI} = & (1/\mu) [p_2(y_2-y_1) p_1 \\ & + p_3 (y_3-y_1) p_1 + p_3 (y_3-y_2) p_2 \\ & + p_4 (y_4-y_1) p_1 + p_4 (y_4-y_2) p_2 + p_5 (p_4-y_3) p_3 \\ & + p_5 (y_5-y_1) p_1 + p_5 (y_5-y_2) p_2 + p_5 (y_5-y_3) p_3 + p_5 (y_5-y_4) p_4 \\ & + p_6 (y_6-y_1) p_1 + p_6 (y_6-y_2) p_2 + p_6 (y_6-y_3) p_3 + p_6 (y_6-y_4) p_4 + p_6 (y_6-y_5) p_5] \end{aligned}$$

In this equation:

$p_1$  is the proportion of population with no illiterate,

$p_2$  is the proportion of population with literate but non-graduate,

$p_3$  is the proportion of population with complete primary school,

$p_4$  is the proportion of population with complete junior high school,

$p_5$  is the proportion of population with complete high school

$p_6$  is the proportion of population with complete higher education

$y_1$  is years of schooling for an individual with illiterate,  $y_1=0$

- $y_2$  is years of schooling for an individual with literate but non-graduate,
- $y_3$  is years of schooling for an individual with complete primary school
- $y_4$  is years of schooling for an individual with complete junior high school
- $y_5$  is years of schooling for an individual with complete high school
- $y_6$  is years of schooling for an individual with complete higher education

*Average year ofShooling (AYS)*

Barro and Lee (2000) divided the population into seven categories including no-schooling (or illiterate), partial primary, complete primary, partial secondary, complete secondary, partial tertiary, and complete tertiary. These categories show differences according to the structure of countries' educational stages, therefore, the number of categories vary. Barro and Lee (2000) included the proportion of drop-outs from a certain stage of education to population in their calculation based on assumption in their study. Additionally, in this study, they moved from the assumption that those who dropped-out from a certain educational stage have completed at least half of the average schooling years of that stage of education.

In this study, AYS was calculated based on 6 categories considering the stages of education in Turkey (n=6). Since there is no sufficient data related to drop-outs from a certain stage of education, the AYS calculations were made based on the most recent stage of education that was completed.

Following Thomas et al. (2001), the formula to calculate AYS is as follows: (2).

$$(2) \quad \mu = AYS = \sum_{i=1}^n p_i y_i$$

The formula for calculating the years of schooling at the six levels of education:

- Illiterate :  $y_1 = 0$
- Literate non-graduate :  $y_2 = y_1 + C_p = C_p$
- Complete-Primary school :  $y_3 = y_2 + C_r = C_r + C_p$
- Complete- Junior high school :  $y_4 = y_3 + C_s = C_r + C_p + C_s$
- Complete-High school :  $y_5 = y_4 + C_t = C_r + C_p + C_s + C_t$
- Complete-Higher education :  $y_6 = y_5 + C_o = C_r + C_p + C_s + C_t + C_o$

Where;

- $C_p$  is the cycle of literate but not graduates in years (1 year).
- $C_r$  is the cycle of the primary schooling (5 years).
- $C_s$  is the cycle of the junior high school (3 years).
- $C_t$  is the cycle of the high school (3 years).
- $C_o$  is the cycle of the higher education (4 years).

Results

*Changes in the AYS and  $E_{Gi}$  in Turkey*

The AYS and  $E_{Gi}$  values calculated for the population at 25 years and above in regions in Turkey have been presented in Table 1. According to Table 1, in the period between 1975 and 2000,

the AYS values of both women and men in all regions increased, and the  $E_{GI}$  values decreased. In 1975, in the regions with low AYS, the increase in AYS rates in the year 2000 was higher. In general, the  $E_{GI}$  is low in the regions where AYS is high. In 1975 and 2000, the AYS values of men were higher than those of women. In the regions with low average AYS values, the difference between women's and men's AYS and  $E_{GI}$  values is higher.

When regions are compared, AYS is high in the western regions of Turkey (İstanbul, İzmir, Ankara, Bursa, Antalya) and the difference between the AYS values of women and men and the  $E_{GI}$  are low. In the eastern regions of Turkey (Erzurum, Van, Gaziantep, Şanlıurfa, Mardin, Ağrı); however, AYS is low and the difference between the AYS values of women and men and the  $E_{GI}$  are high. The first five regions with the lowest AYS values in 1975 are Mardin (1.06 years), Van (1.15 years), Şanlıurfa (1.36 years), Gaziantep (1.62 years) and Kastamonu (1.77 years), respectively. The first five regions with the highest AYS values are İstanbul (4.89 years), Ankara (4.54 years), İzmir (3.91 years), Bursa (3.14 years) and Kocaeli (2.91 years), respectively. This order does not show much difference in the year 2000, either. In the year 2000, the first five regions with the lowest AYS values were Mardin (3.58 years), Şanlıurfa (3.67 years), Van (3.73 years), Ağrı and Gaziantep (4.49 years), respectively (in descending order). The regions with the highest AYS values in the year 2000 were Ankara (7.43 years), İstanbul (6.76 years), İzmir (6.46 years), Antalya (6.38 years) and Bursa (6.05 years).

Table 1.

*Average year of schooling, education Gini index by regions and gender in Turkey, 1975–2000*

	1975						2000						1975-2000 Period					
	All		Males		Females		All		Males		Females		AYS increase (year)			$E_{GI}$ decrease ratio (%)		
	AYS	$E_{GI}$	AYS	$E_{GI}$	AYS	$E_{GI}$	AYS	$E_{GI}$	AYS	$E_{GI}$	AYS	$E_{GI}$	Total	Male	Female	Total	Male	Female
İstanbul	4.89	0.42	5.81	0.35	3.90	0.51	6.76	0.33	7.55	0.28	5.97	0.39	1.87	1.74	2.06	-0.21	-0.19	-0.24
Kırklareli	2.89	0.54	3.56	0.46	2.17	0.63	5.87	0.33	6.62	0.29	5.11	0.37	2.98	3.05	2.93	-0.39	-0.37	-0.41
Çanakkale	2.70	0.57	3.34	0.50	2.03	0.65	5.44	0.37	6.28	0.33	4.60	0.41	2.74	2.94	2.58	-0.35	-0.34	-0.38
İzmir	3.91	0.47	4.73	0.39	3.04	0.57	6.46	0.35	7.26	0.30	5.68	0.41	2.54	2.53	2.64	-0.25	-0.23	-0.28
Muğla	2.55	0.59	3.51	0.45	1.59	0.73	5.64	0.36	6.50	0.30	4.77	0.43	3.09	2.98	3.18	-0.39	-0.34	-0.41
Manisa	2.30	0.63	3.21	0.50	1.38	0.76	5.00	0.37	6.03	0.29	3.99	0.44	2.70	2.82	2.61	-0.41	-0.41	-0.43
Bursa	3.14	0.53	4.04	0.43	2.20	0.64	6.05	0.34	7.00	0.29	5.10	0.38	2.90	2.96	2.90	-0.36	-0.33	-0.40
Kocaeli	2.91	0.57	3.88	0.45	1.88	0.70	5.72	0.35	6.79	0.29	4.62	0.41	2.81	2.90	2.74	-0.38	-0.36	-0.41
Ankara	4.54	0.51	5.77	0.39	3.24	0.62	7.43	0.34	8.45	0.28	6.43	0.40	2.88	2.68	3.19	-0.33	-0.30	-0.36
Konya	2.60	0.59	3.70	0.44	1.52	0.74	5.39	0.35	6.54	0.29	4.26	0.39	2.79	2.84	2.73	-0.41	-0.35	-0.47
Antalya	2.81	0.56	3.80	0.42	1.77	0.70	6.38	0.35	7.26	0.29	5.46	0.41	3.57	3.45	3.69	-0.37	-0.31	-0.42
Adana	2.85	0.60	3.87	0.46	1.75	0.74	5.77	0.39	6.78	0.31	4.79	0.46	2.92	2.92	3.03	-0.34	-0.31	-0.38
Hatay	2.06	0.70	3.13	0.54	0.95	0.86	4.82	0.45	6.12	0.34	3.57	0.55	2.77	3.00	2.61	-0.36	-0.38	-0.36
Niğde	2.11	0.67	3.25	0.50	1.08	0.82	5.22	0.40	6.55	0.30	3.93	0.48	3.11	3.30	2.85	-0.41	-0.40	-0.42
Kayseri	2.11	0.67	3.16	0.52	1.10	0.81	5.15	0.41	6.48	0.32	3.84	0.49	3.04	3.32	2.74	-0.38	-0.38	-0.39
Zonguldak	2.44	0.63	3.50	0.48	1.32	0.79	5.20	0.40	6.42	0.30	4.06	0.48	2.76	2.92	2.74	-0.37	-0.38	-0.39
Kastamonu	1.77	0.72	2.59	0.60	1.01	0.82	4.67	0.44	5.86	0.35	3.52	0.51	2.90	3.27	2.51	-0.39	-0.41	-0.38
Samsun	1.92	0.70	2.80	0.57	1.06	0.82	4.83	0.43	5.98	0.35	3.74	0.50	2.91	3.18	2.68	-0.39	-0.39	-0.39
Trabzon	1.96	0.69	3.12	0.52	0.91	0.85	5.08	0.44	6.48	0.33	3.72	0.53	3.12	3.36	2.80	-0.37	-0.38	-0.37
Erzurum	2.13	0.69	3.12	0.55	1.13	0.81	5.09	0.44	6.60	0.34	3.56	0.53	2.97	3.47	2.42	-0.35	-0.38	-0.34
Ağrı	1.88	0.71	2.90	0.56	0.86	0.85	4.01	0.54	5.63	0.39	2.38	0.69	2.13	2.73	1.53	-0.24	-0.31	-0.19
Malatya	2.06	0.69	3.04	0.56	1.07	0.83	5.10	0.47	6.69	0.36	3.54	0.58	3.04	3.64	2.47	-0.31	-0.36	-0.30
Van	1.15	0.83	1.93	0.71	0.39	0.94	3.73	0.59	5.49	0.43	1.93	0.75	2.58	3.56	1.54	-0.28	-0.40	-0.20
Gaziantep	1.62	0.77	2.56	0.61	0.71	0.93	4.49	0.48	5.93	0.35	3.07	0.61	2.86	3.37	2.37	-0.38	-0.43	-0.35
Şanlıurfa	1.36	0.81	2.19	0.69	0.54	0.92	3.67	0.60	5.39	0.44	1.96	0.77	2.31	3.20	1.42	-0.25	-0.37	-0.16
Mardin	1.06	0.84	1.80	0.72	0.35	0.94	3.58	0.62	5.43	0.45	1.73	0.78	2.52	3.63	1.38	-0.26	-0.38	-0.17
TURKİYE	2.79	0.61	3.77	0.49	1.79	0.74	5.67	0.40	6.77	0.32	4.59	0.47	2.89	3.00	2.80	-0.35	-0.35	-0.36

Source: The values were calculated based on the raw data obtained from the Tables 3. 9. on Population by Literacy, education level, 1975-2000 (population 25 years of age and over), which are presented in the source *Census of Population 2000-Social and Economic Characteristics of Population by provinces in Turkey*.

When examined regarding gender, the average year of schooling in men was higher than that of AYS in women between 1975 and 2000. The difference between men and women did not increase in this period. The difference between men and women between 1975 and 2000 in general in Turkey increased by 0.2 years. However, the difference between the AYS of men and that of women in the regions of Ankara (-0.51 years), İstanbul (-0.32 years), Antalya (-0.23 years), Aydın (-0.2 years), Adana (-0.12 years) and İzmir (-0.11 years) decreased. The difference between the AYS of men and that of women increased the most in Mardin (2.25 years), Van (2.02 years), Şanlıurfa (1.79 years), Ağrı (1.2 years) and Malatya (1.17 years) regions. These regions are the areas where inequality in education is the highest. There are very important differences among regions regarding the AYS values of men and those of women. In the year 2000, the AYS values of the women who lived in Mardin (1.73), Şanlıurfa (1.96), Van (1.93) and Erzurum (2.38) regions were lower than the AYS values of the women who lived in İstanbul (3.90), İzmir (3.04) and Ankara (3.24) in 1975.

In general, EGI decreased in the period between 1975 and 2000. The decrease in EGI was the least proportionally in İstanbul (-0.21%), Ağrı (-0.24%), İzmir (-0.26%), Şanlıurfa (-0.26%) and Mardin (-0.26%) regions. In this period, EGI increased proportionally the most in Konya (-0.41%), Manisa (-0.41%), Niğde (-0.40%), Samsun (-0.39%), Kastamonu (-0.39%) regions.

*The Relationship Between AYS and EGI*

The relationship between the AYS values of the population at or over the age of 25 in Turkey and EGI is presented in Figure 1. According to Figure 1, there is a negative relationship between AYS and EGI. This negative relationship stops approximately when the AYS value reaches 6 years, the decrease in EGI stops, and follows a horizontal progress.

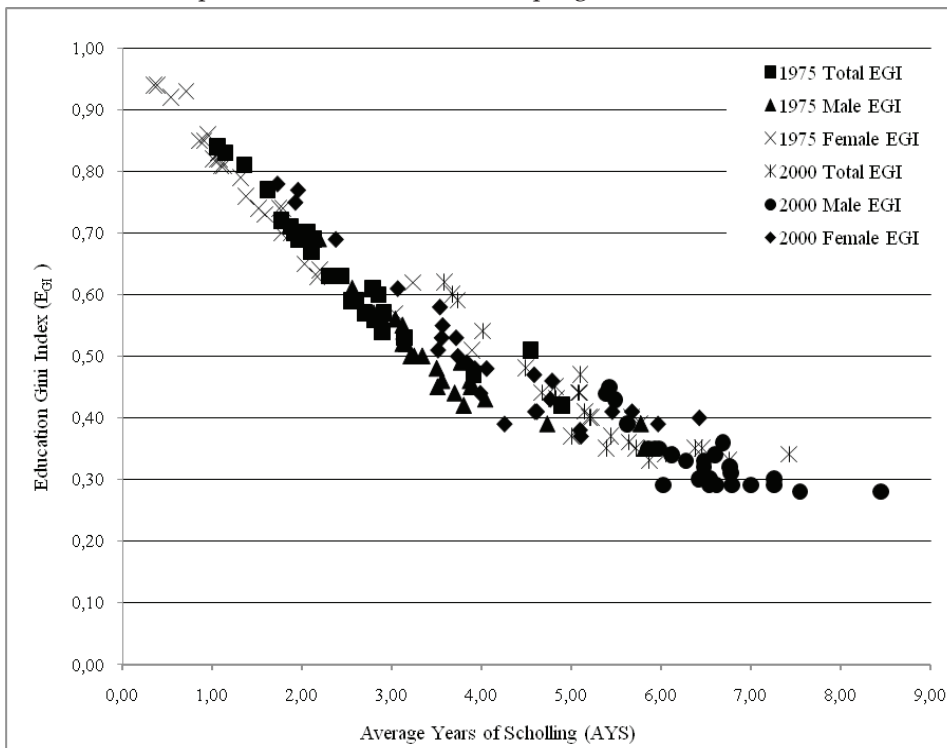


Figure 1. Relationship between AYS and  $E_{GI}$

The relationship between the increase in AYS values among the people at the age of 25 and over in the population during the period between 1975 and 2000 in Turkey and EGI is shown in Figure 2.

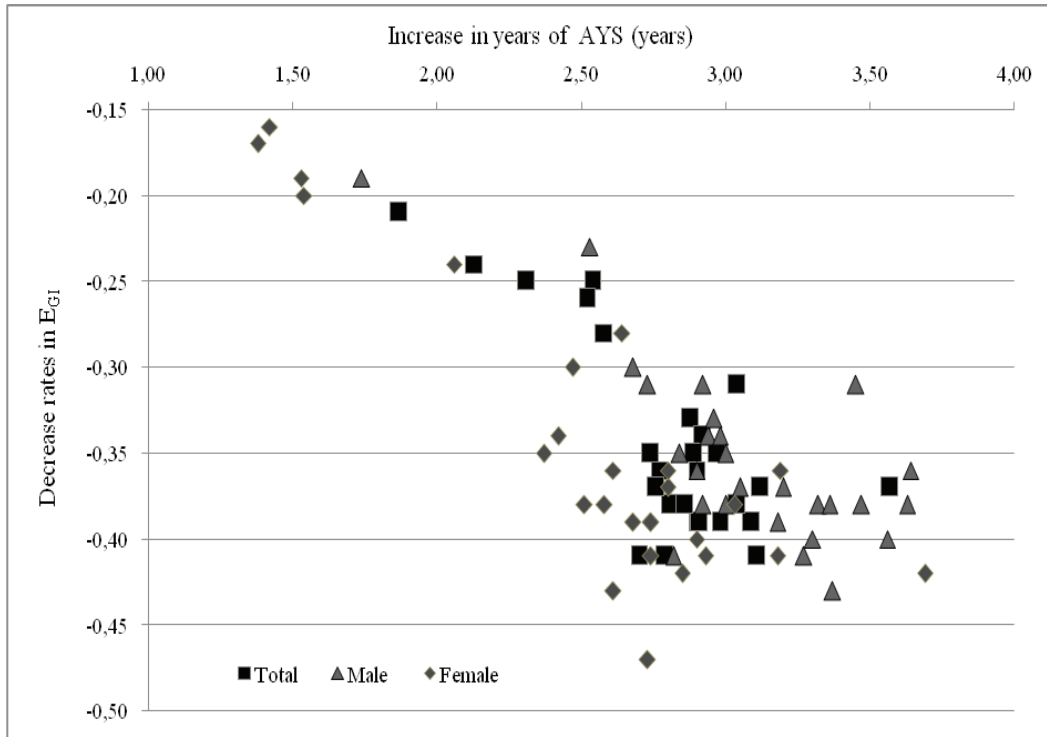


Figure 2. Relationship between amount of increase in years of education (years) and decrease rates in education Gini index

According to Figure 2, there is a positive relationship between the amount of the increase in AYS and the rate of the decrease in EGI. However, the decrease in inequality rates stops as the increase in AYS approaches 3 years hence the positive relationship stops. Increases in AYS beyond 3 years do not change the decrease rates in EGI.

### Discussion

Barro and Lee (2000) calculated the AYS values of the countries and regions in the world between the years 1960 and 2000. According to this study, the AYS values of both women and men in the world and all the regions in the period between 1960 and 2000 increased. In this period, men's AYS values in the world and in the regions were higher than those of women. Despite the positive developments in education, the difference between the AYS values of men and women increased to the disadvantage of women. It can be seen that developments in the average year of schooling in the period between 1975 and 2000 in Turkey are parallel in general to the developments in the world (Baro and Lee, 2001; Zahang and Li, 2002; Tablo 1). When compared to the results of Baro and Lee's (2000) study, the AYS values of women and men in Turkey in general and at the regional level are among the values of those countries which are on the way and in the process of development (Table 1). According to the data of the year 2000, an individual at the age of 25 and over in Turkey did not have schooling for the period of primary school education on average. In all the regions, the AYS values of men and women were below the global average. The level of education of the women in the regions of Erzurum, Van, Şanlıurfa and Mardin in the year 2000 was below even that of the women living in the countries in Southern Asia. In 1975, in the regions where AYS was low, the difference between the years of schooling of men and women increased further in 2000.



In determining inequality in education, in the studies which used the Gini index, it is stated that there is a negative relationship between year of schooling and inequality (Thomas et al., 2002, 2001; Checchi, 2001; Thomas et al., 2002, 2002; Meas, 2005). However, no results were reported on the value levels that this negative relationship occurs and the value levels that this relationship decreases. In this study, which was conducted at the regional level in Turkey, a negative relationship between AYS and EGI was found. When the AYS values are low, the EGI values are high. In 1975, in the regions with low AYS, the increase in the years of schooling in the following period was proportionally higher than those in the other regions, and, as parallel, there was a decrease in EGI. However, this decrease continued approximately until 6 years of AYS. There was no decrease in EGI values when AYS was 6 years and over. Ram (1990) stated that inequality tends to decrease after approximately 6.8 years according to the standard deviation values. In addition, a positive relationship was observed between the increase in AYS rates and decrease in EGI rates. When an approximately between 1.5 and 3 years of increase occurs in AYS values, the decrease in EGI rates increased. However, when an increase of 3 years or more occurs in AYS values, there is no difference in the decrease in EGI rates. When an increase of 3 years occurred in AYS values, this caused the EGI to fall by 40–45%.

### Conclusions

The level of education of the population at and over the age of 25 in Turkey in general and in all of the regions in Turkey between 1975 and 2000 increased. In this period, the average year of schooling in Turkey was below the world's average and the increase in the years of schooling was above the world average. In all of the regions, the level of education of men was higher than that of women. The existing disadvantage of inequality in 1975 in women's status increased further in 2000. There is a negative relationship between average year of schooling and educational inequality. However, this negative relationship stops when the years of schooling approaches to about 6 years. Again, there is a positive relationship between the amount of increase in the years of schooling and the amount of decrease in inequality in education. When an increase of about 1.5 and 3 years occurs in average year of schooling, the decrease rates in inequality in education increase. However, when there is an increase of 3 years and over in the average year of schooling, a change does not occur in the decrease rates in inequality in education. When there is an increase of 3 years in the level of education on average, this causes inequality in education decrease by 40 to 45%.

Compulsory schooling period should be extended by making pre-school and secondary school periods a part of this compulsory education. To decrease the inequalities in regional level, policies at regional levels should be developed. Social and economical policies should also be improved to keep women within the process of education further.

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