

BIBLIOGRAPHIC DATA SHEET

1. CONTROL NUMBER
PN-AAH-5482. SUBJECT CLASSIFICATION (695)
JA00-0000-G831

3. TITLE AND SUBTITLE (240)

Regional variations in educational attainment in Turkey; a cursory review of some existing statistical evidence

4. PERSONAL AUTHORS (100)

Miller, D. R.; Cetin, Ihsan

5. CORPORATE AUTHORS (101)

AID/NE/USAID/Turkey

6. DOCUMENT DATE (110)

1972

7. NUMBER OF PAGES (120)

76p.

8. ARC NUMBER (170)

TU370.094961.M647

9. REFERENCE ORGANIZATION (130)

Turkey

10. SUPPLEMENTARY NOTES (500)

(In Discussion paper no. 12)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

Education and development
Turkey
Human resources
Statistics
Education, ElementaryEducation, Higher
Education, Secondary

13. PROJECT NUMBER (150)

14. CONTRACT NO.(140.)

Turkey

15. CONTRACT
TYPE (140)

16. TYPE OF DOCUMENT (160)

TU
2000-1-14-11
1-14-11

PN- AAH-548

ECONOMIC STAFF PAPERS



A.I.D.
Reference Center
Room 1656 NS

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT
ANKARA, TURKEY

The United States Agency for International Development sponsors the papers in this series; however, the ideas and opinions expressed are those of the authors and are not necessarily those of the Agency or the United States Government.



Bu serideki raporlar A.B.D. Uluslararası Kalkınma Teşkilatının himayesinde basılmıştır. Bununla beraber, ihtiva ettikleri fikir ve yargılar yazarlarına ait olup Teşkilat veya A.B.D. Hükümetinin değildir.

Discussion Paper No. 12

REGIONAL VARIATIONS IN EDUCATIONAL
ATTAINMENT IN TURKEY - A cursory
Review of Some Existing Statistical
Evidence

By
Duncan R. Miller
and
Ihsan Çetin

Economic Analysis Staff
United States Agency for International
Development
Vali Dr. Reşit Caddesi No. 16
Ankara, Turkey

December 1972

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>
1	Literacy Trends - Total Population
2	Literacy Trends - Urban Population
3	Literacy Trends - Rural Population
4	Literacy Trends - Urban-Rural Differentials
5	Literacy Trends - Age Groups
6	Last School Graduated - Total Male
7	Last School Graduated - Total Female
8	Last School Graduated - Urban-Rural, Male-Female
9	Educational Attainment and Sector of Economic Activity - 1960
10	Educational Attainment and Sector of Economic Activity - 1965
11	Primary School - Schools, Students, Graduates and Teachers
12	Secondary School - Schools, Students, Graduates and Teachers
13	Lycee Education - Schools, Students, Graduates and Teachers
14	Technical-Vocational - Schools, Students, Graduates and Teachers
15	Higher Education - Schools, Students, Graduates and Teachers
16	Percentage of Primary School Enrollment Which Attained Each Level of Education
17	Percentage of Graduates from Each Level Who Graduated from Higher Education
18	Structure of Primary Education - School Years 1965 and 1970
19	Structure of Primary Education - Initial Parameters for 1970-1971 and Possible Structure for 1971-1972
20	Financing Education - Budgets and Investments
21	Regional Education Expenditure Data 1963-1968

APPENDIX TABLES - Student Flow Analysis

1. 1965-1966, Primary School - Part I
2. 1965-1966, Secondary School - Part II
3. 1966-1967, Primary School - Part I
4. 1966-1967, Secondary School - Part II
5. 1969-1970, Schools and Teachers - Part I
6. 1969-1970, Students - Part II
7. 1969-1970, Indicators - Part III
8. 1970-1971, Schools and Teachers - Part I
9. 1970-1971, Students - Part II
10. 1970-1971, Indicators - Part III

FOR DISCUSSION PURPOSES ONLY

REGIONAL VARIATIONS IN EDUCATIONAL ATTAINMENT IN TURKEY -
A CURSORY REVIEW OF SOME EXISTING STATISTICAL EVIDENCE

Duncan R. Miller and Ihsan Çetin 1/

I. Introduction and Scope of Analysis

Few areas within comprehensive economic development planning generate as much debate and nationalistic fervor as does education. Yet, at the same time, education remains one of the most ambiguous areas of development planning; indeed, if one regards education as a production process, confusion abounds as to the optimal production function, the input-output interrelationships between education and other sectors, and even the nature and composition of the final demand for the product. As in most other nations, Turkish development planners have yet to discover the total set of relevant questions to be asked in educational planning and devise appropriate methodologies with which to investigate the necessary policy parameters. For example, although Turkish development planners have engaged in some attempts to identify and project manpower requirements, insufficient efforts have been undertaken to coordinate, much less to integrate, educational and manpower planning. Endeavors by economists and development planners to seek guidance and initiatives from other social scientists to establish linkages between education and other macro sector plans have yielded only modest results at best; this point is not noted to identify

fault, rather to indicate the complexities which prevail.

Although articulation of a concise theory of human resource development and resultant planning methodologies is clearly desirable, the purpose of this paper is much more modest. As the title implies, the authors attempt herein to present historical data describing the major indicators of educational attainment in Turkey. Primary emphasis is given to the basic foundations of the education structure, namely, literacy, primary and secondary education levels. Admittedly, most of the relevant educational planning issues are not addressed in this paper nor are any specific hypotheses tested. The document merely represents an introduction to Turkish education facts and figures. Although a working knowledge of the structure of the Turkish educational system is presumed, a brief diagrammatic outline is presented in Appendix A. The unit of observation used is that of the region. A regional-based presentation was selected because of the imperfections and possible distortions inherent in national averages and the difficulty in comprehending and analyzing individual provincial-level data. Consequently, the 67 provinces of Turkey are aggregated into eight regions (See Exhibit 1) which are:

1. Marmara
2. Middle Anatolia
3. Aegean
4. Antalya
5. Çukurova
6. Western Black Sea
7. Eastern Black Sea
8. Eastern Anatolia

The regional delineation is that of the İmar ve İskan Bakanlığı (Ministry of Reconstruction and Settlement). İmar-İskan regional prototypes are utilized to give analysis greater flexibility in tying educational planning into overall regional economic development planning.

The organization of this paper is intentionally very simple. Sections 1 through 3 review education data derived from Census books; section 4 attempts to present the more dynamic elements within a student flow framework; finally, section 5 indicates the relative magnitude of education financing. Each major statistic is presented and briefly described; historical trends and regional variations are noted. Although no effort is made systematically and statistically to analyze the data presented, some broad policy-oriented observations are ventured and a few specific areas of necessary research are listed. Unfortunately, complete 1970 census data are not yet available. Consequently, some of the data are over seven years out of date and not all Second Five Year Development Plan rates of target realization can be calculated. Yet, to the extent possible, targets and projections contained in Third Five Year Plan documents are analyzed.

II. Comments on Major Education Statistics

As the attached bibliography indicates, education in Turkey has been the subject of considerable scholarly investigation; yet, research efforts to date have signally failed to probe deeper than national averages and the traditional urban-rural, male-female comparisons. The data presented below, however, reveal sizeable interregional and intra-regional variations in most of the attainment indicators. Some crude measures of trend variation are also calculated which indicate a relative widening in some of the regional attainment discrepancies.

We do not purport to examine all of the relevant educational measures nor have we ventured into the realm of cause and effect or posited any forecasts of the future. Moreover, many traditional forms of informal education such as pre-school education, adult literacy, and on-the-job training are not widely practiced in Turkey and are therefore omitted in our investigation.

1. Literacy

Worldwide, literacy attainment represents the most basic educational skill acquisition and often enters into plan formulations as a fundamental social, economic, and political prerequisite to development. Although the Second Five Year Development Plan is relatively silent on literacy goals and policies to be implemented, the Plan implies a gradual achievement of almost universal literacy through a "literacy mobilization" drive.

Analysis of literacy trends from 1955 to 1965 (Tables 1 through 5) indicates overall literacy levels and increases as follows:

POPULATION 6 YEARS AND OLDER

Literacy Increases
1955 - 1965

	<u>% Literate</u>		<u>Increase in</u>	<u>Percent</u>
	<u>1955</u>	<u>1965</u>	<u>Numbers(000)</u>	<u>Increase</u>
Total Turkey	40.9	48.7	4,590	58.0
Male	55.7	64.0	2,893	52.8
Female	25.5	32.8	1,696	69.6
Urban Total	63.6	66.9	3,203	108.4
Male	74.7	75.4	2,026	105.4
Female	49.8	52.3	1,182	113.8
Rural Total	33.7	38.5	1,382	27.9
Male	49.1	54.6	868	24.4
Female	18.7	22.9	514	36.8

Note: 1970 Census results (15% sample) indicate the following literacy Levels: % literate total, 54.8; males, 69.1; females 40.0.

Turkey's literacy achievement has reached a point where she can boast of almost universal urban male literacy. Although the overall urban-rural literacy gap decreased slightly, urban literacy levels and increases remain much

greater than rural attainments. Female literacy increased more than corresponding male rates, yet their plight is still obvious: seven out of ten females reside in rural areas but, less than one out of four of them can lay claim to literate status. On the other hand, the following tables reveal that the growth of literacy has not been shared equally by all regions and in one notable case, Eastern Anatolia, rural literacy growth has actually fallen relative to the population change.

a. Table 1 - Total Population

Relative literacy attainment ranks for 1955 and 1965 remain identical with the Western provinces exhibiting much higher degrees of literacy than the Eastern or Black Sea provinces, for both males and females. Although the index of relative change indicates that, except for the very important case of Eastern Anatolia, there was an inverse relationship between relative rank and the relative change index, that is the literacy gap between the highest and lowest provinces has widened. These are of course crude rates and do not reflect possible individual counter forces of population increase, migration, and lapses back into illiteracy. Eastern Anatolia's poor literacy performance is further explicated in the discussion of rural literacy (Table 3) and will therefore not be elaborated upon here. The sizeable male-female differentials not only remain quite large but also have not been relatively decreased, indeed many have widened.

TABLE 1
LITERACY TRENDS
TOTAL POPULATION BY
CENSUS YEARS AND REGIONS

Region	1955			1965			Index of Relative Change ^{1/}		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Marmara	57.8	69.4	44.7	66.2	76.9	54.2	159.9	144.9	137.6
Middle Anatolia	39.6	56.9	22.3	50.3	67.2	33.4	211.1	174.7	282.5
Aegean	46.4	63.6	33.1	57.1	71.0	42.8	173.3	145.7	224.1
Antalya	43.7	62.9	25.3	51.0	68.5	35.2	175.0	137.2	270.7
Çukurova	39.5	56.5	23.1	49.7	66.1	32.1	134.3	155.2	223.5
Western Black Sea	34.4	51.7	18.1	43.2	60.3	26.3	228.9	185.2	336.4
Eastern Black Sea	31.0	49.7	14.2	38.0	57.3	21.1	210.6	166.7	326.8
Eastern Anatolia	28.3	39.4	17.3	31.0	46.4	14.6	131.1	171.3	33.5
Total Turkey	40.9	55.7	25.5	48.7	64.0	32.8	178.3	159.4	218.4

^{1/} (% change in Literates) / (% change in Population)

Source: 1955 Population Census, Table 29 a.

1965 Population Census, Table 27.

Assuming yearly growth rates of population and literacy of 2.6 and 4.5 percent respectively, national literacy attainment might reach slightly over 60 percent by 1978. On the other hand, a plan target of universal literacy, if attained, would require a yearly growth rate of literacy over 10.5 percent. This implies that if universal literacy were targeted and achieved, a more than doubling of yearly outputs (literate) - though not necessarily a doubling of inputs - is required in the Third Five Year Plan period.

b. Table 2 - Urban Literacy

For most practical purposes, urban literacy, at least for males, is now an established fact in Turkey. Although Eastern Anatolia lags behind the western provinces, urban literacy exhibits much more homogeneous levels of attainment than rural literacy, even though sizeable male-female differentials persist.

An urban literacy drive could be inundated by significant inflows of illiterate migrants; however, in the case of Turkey, scholarly investigations concerning migration imply trends of relatively educated migrants (i.e., primary school graduates) flowing into the large cities. Future attempts at literacy extension therefore might well be focused on rural areas and small towns if universal literacy is ever to be approached much less achieved. The following table on rural literacy highlights both the degree of present inter-regional and intraregional differentials and the magnitude of efforts which will have to be undertaken to achieve wide-spread literacy.

TABLE 2
LITERACY TRENDS

URBAN POPULATION BY CENSUS YEARS AND REGIONS
(%)

Region	1955			1965			Index of Relative Change <u>1/</u>		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Marmara	71.6	80.0	61.3	75.3	83.8	64.6	113.1	112.9	113.7
Middle Anatolia	64.9	71.6	49.8	69.2	82.4	53.9	109.1	108.9	114.5
Aegean	63.4	74.9	49.9	68.8	80.5	56.1	119.8	114.0	129.2
Antalya	63.2	77.6	47.6	66.5	80.5	50.2	107.4	105.2	107.7
Çukurova	54.7	68.5	38.5	61.6	75.1	46.1	125.0	119.4	138.7
Western Black Sea	62.2	71.2	47.5	69.0	82.2	53.5	121.5	136.4	121.5
Eastern Black Sea	57.5	72.6	40.2	61.1	77.0	43.2	110.0	109.6	111.6
Eastern Anatolia	45.6	59.1	28.8	51.0	65.1	30.1	120.9	121.7	107.5
Total Turkey	63.6	74.7	49.8	66.9	79.4	52.3	110.6	113.0	109.8

1/ (% Change in Literates) / (% Change in Population)

Source: 1955 Population Census, Table 29 b.

1965 Population Census, Table 27 a.

c. Tables 3 and 4 - Rural Literacy

Although the index of relative change indicates rapid growth of rural literacy - again with the notable exception of Eastern Anatolia - literacy skill acquisition remains a dream for most of rural Turkey. Given 1965 data, four out of five urban males are literate whereas only five out of ten rural males have achieved literacy. To this must be contrasted corresponding female literacy rates of five out of ten for urban and a meager one out of five for rural areas. Again, the interregional variations are dramatic. The fate of the rural, Eastern Anatolia female represents the most tragic trend. Although Eastern Anatolia alone contains almost one quarter of the total rural female population, only nine percent of these females are literate. Moreover, not only does the index of relative change imply that literacy has decreased relative to population but also the absolute percentage of literates has fallen. Likewise, as Table 4 reveals, for most of the eastern half of Turkey, the urban-rural literacy gaps are growing larger.

d. Table 5 - Literacy by Age Cohorts

Data contained in this table are generally as one would hypothesize and therefore, for present purposes, do not warrant further elaboration. A regional age cohort calculation was deemed to be beyond the present scope of work and would probably reveal trends very similar to those in Table 4, except where noted earlier.

TABLE 3

LITERACY TRENDS

RURAL POPULATION BY CENSUS YEARS AND REGIONS

Region	1955						1965			Index of Relative Change <u>1/</u>		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Marmara	47.0	60.3	33.0	56.1	68.1	43.4	305.2	237.4	435.6			
Middle Anatolia	32.4	50.0	15.6	39.4	57.1	22.6	452.0	377.3	751.3			
Aegean	42.4	53.4	26.7	50.0	67.0	35.1	234.6	224.2	351.4			
Antalya	41.1	60.3	22.6	45.4	62.4	29.1	344.5	151.9	326.2			
Çukurova	32.6	50.6	14.0	42.4	59.6	21.9	373.2	202.7	461.0			
Western Black Sea	30.2	47.8	15.0	36.4	54.4	20.0	271.6	197.8	436.6			
Eastern Black Sea	23.0	46.7	11.6	33.0	52.1	15.3	244.5	137.5	419.6			
Eastern Anatolia	25.6	35.3	15.6	23.2	37.1	9.2	28.7	145.2	-191.9			
Total Turkey	33.7	49.1	18.7	38.5	54.6	22.9	236.4	207.0	311.5			

1/ (% Change in Literates) / (% Change in Population)

Source: 1955 Population Census, Table 29 c.

1965 Population Census, Table 27 b.

TABLE 4

Literacy Trends
 Urban-Rural Differentials by
 Census Years and Regions (%)

Region	1955			1965		
	Total	Male	Female	Total	Male	Female
Marmara	24.6	19.7	28.3	19.2	15.7	21.7
Middle Anatolia	32.5	23.6	34.2	29.8	25.3	31.3
Aegean	21.0	16.5	23.2	18.8	13.5	21.0
Antalya	22.1	16.3	25.0	21.1	16.1	21.1
Çukurova	22.1	17.9	24.5	19.2	16.5	24.2
Western Black Sea	32.0	23.4	32.5	32.6	27.8	33.5
Eastern Black Sea	29.5	25.9	28.6	28.1	24.9	27.4
Eastern Anatolia	20.9	22.3	13.2	27.3	29.9	20.9
Total Turkey	29.9	25.6	31.1	28.4	24.3	29.4

TABLE 5

Literacy Trends

Literacy Trends by Age Groups

(5)

Age Group	1955			1965		
	Total	Urban	Rural	Total	Urban	Rural
MALE						
6-10	47.3	70.9	42.3	50.2	67.8	44.6
11-15	66.6	84.6	61.6	61.5	82.9	75.4
17-24	67.0	77.7	61.1	61.0	89.6	73.6
25-29	67.4	81.3	61.2	75.8	87.6	68.8
30-34	64.0	80.9	57.1	69.8	83.4	62.3
35-39	57.4	76.8	50.2	66.4	81.7	59.0
40-44	52.6	72.3	45.5	62.3	83.7	52.6
45-49	46.2	67.5	32.0	56.2	75.3	46.0
50-59	34.3	59.3	22.8	46.1	67.6	36.6
60 and older	26.7	51.1	18.5	26.0	49.1	17.3
Total	55.8	74.7	49.1	64.0	80.7	55.7
FEMALE						
6-10	35.2	62.7	29.1	38.5	61.6	30.8
11-16	44.9	72.3	37.7	56.8	81.3	47.0
17-24	31.8	61.1	23.7	44.2	70.0	33.1
25-29	24.7	55.6	16.1	33.0	57.2	22.7
30-34	22.8	53.4	13.7	27.0	51.6	16.9
35-39	19.7	47.8	10.9	25.1	49.0	13.3
40-44	14.7	39.2	7.4	21.4	46.7	10.2
45-49	12.7	33.2	5.8	13.7	42.3	7.3
50-59	9.6	26.2	4.4	11.4	30.0	3.5
60 and older	6.1	16.2	3.0	5.8	16.8	1.2
Total	25.5	49.8	18.7	32.8	55.2	23.6

Calculated from: 1955 Population Census, Tables 28 a through 28 c
1965 Population Census, Tables 26 through 26 b

2. Last School Graduated

As in the case of literacy, census data last school graduation statistics represent a stock of accumulated past efforts. Unfortunately census data on last school graduated are difficult to analyze since each census report has chosen different minimum ages for data collection: (1950 - 6 years and older, 1960 - 10 years and older, and 1965 - 11 years and older). Moreover, the 1955 census did not report last school graduation levels.

From a national standpoint, the relative probabilities of attaining various levels of education are presented below:

Out of every 100 population who ever graduated from a school, how many attained each level of education

	M a l e			F e m a l e		
	1950	1960	1965	1950	1960	1965
Primary	19	52	57	8	55	62
Secondary)		7	7		6	6
)						
Lycee)	4	2	3	1	2	2
)						
Vocational	1	2	3	-	2	3
Higher	1	2	2	-	1	1

NOTE: As will be amplified below, these data cover only those who in fact graduated from a school and not total population. Moreover, as Kazamias emphasizes, "the Turkish system of educational attainment and opportunity may be likened to a minaret-shaped pattern: enrollments diminish steadily and substantially from the primary school to the university levels, and they are dramatically peaked and constrained at the summit. A child's chances of continuing his education are clearly lowest at the primary-middle rung of the education ladder and highest at the Lise-University one." ^{2/}

Section 4 below, Student Flow Analysis, will specifically address the dynamics of educational opportunities but, the following statistics may be illustrative of the chances of attaining a higher education degree at each lower level:

1. Of each 100 primary school students, only about four could expect to attain University graduation.
2. Of each 100 secondary school students, approximately 20 could expect to attain University graduation, yet.
3. Of each 100 lycee (lise) students, about 55 could expect to attain University graduation.

The census data presented cover only those who in fact graduated from a school and not total population of that age group. One must therefore calculate the percentages of population who either did not enter school or never graduated; these calculations are presented below:

	M a l e			F e m a l e		
	1950	1960	1965	1950	1960	1965
% Graduated from some school	24.8	36.9	47.5	10.5	16.5	23.3
% Completed courses but never graduated	2.8	19.5	19.6	1.3	8.1	8.3
% Either not enrolled or not completed courses	72.4	43.6	32.9	88.2	75.4	68.4

From the census data (Table 6 and 7), one would be led to believe that primary school attainment is a well-established phenomenon in Turkey; yet, as seen above and below, this is far from reality. The census data similarly must be adjusted to include total population rather than just those graduated from

school. Such a massive data readjustment is clearly beyond the scope of this paper; however, the adjustments for 1960 and 1965 below indicate the crude magnitudes about which the census data are misleading:

	<u>Male</u>		<u>Female</u>	
	<u>1960</u>	<u>1965</u>	<u>1960</u>	<u>1965</u>
1. % Primary graduates out of "educated" population	52.0	56.6	55.3	61.7
2. % Primary graduates out of total population	29.4	22.0	13.6	9.9

In other words, as in the example of females, of those who ever graduated from a school as of 1965, 61.7 percent had only attained primary education; yet, these same educated females represented only 9.9 percent of the total female population. Thus the stock of finished product (primary school graduates) remains small indeed and the potential flow into succeeding levels is severely constrained. Although these calculations imply a relative decline in primary school graduates, the data should be further refined and disaggregated by age cohorts to reveal how many new potential entrants do not achieve primary education. Such analysis for recent school years is presented in Section 4 below.

Consequently, very little reliance can be placed on this section of census data and any statements made must be qualified as "based on those who did graduate from some school." Table 8 is however interesting in that it indicates that out of those who did graduate from some school:

1. Except for the Black Sea and Eastern Anatolia, rural females have the greatest degree of primary school attainments,

TABLE 6

POPULATION BY LAST SCHOOL GRADUATED
 TOTALS BY REGION AND CENSUS YEAR
 (%)
 MALES

<u>Year</u>		<u>Primary</u>	<u>Secondary</u>	<u>Lycee</u>	<u>Vocational</u>	<u>Higher</u>
1950	Marmara	27.1	-	2.1	1.1	1.7
	Middle Anatolia	18.7	-	3.0	1.0	0.9
	Aegean	23.7	-	4.1	0.9	0.6
	Antalya	24.1	-	1.9	0.3	0.3
	Çukurova	17.2	-	3.2	0.8	0.5
	Western Black Sea	18.5	-	2.0	0.6	0.3
	Eastern Black Sea	14.7	-	1.6	0.5	0.2
	Eastern Anatolia	8.7	-	1.5	0.5	0.4
	Total Turkey	18.8	-	3.6	0.8	0.8
1960	Marmara	49.5	9.1	4.4	2.4	2.3
	Middle Anatolia	50.4	6.7	2.4	2.3	2.4
	Aegean	53.9	6.0	1.7	2.1	1.3
	Antalya	60.2	4.4	0.9	1.8	0.3
	Çukurova	51.3	6.8	2.1	2.2	1.1
	Western Black Sea	54.0	4.5	1.0	2.2	0.9
	Eastern Black Sea	51.8	4.4	0.9	1.3	0.6
	Eastern Anatolia	47.2	5.3	1.1	2.3	1.1
	Total Turkey	52.0	6.7	2.4	2.3	1.3
1965	Marmara	55.9	8.7	4.7	2.8	3.0
	Middle Anatolia	57.3	6.9	3.0	2.9	2.5
	Aegean	61.5	6.5	2.2	2.2	1.5
	Antalya	65.0	5.0	1.3	2.1	1.1
	Çukurova	56.2	7.4	2.5	2.3	1.3
	Western Black Sea	57.3	4.9	1.2	2.3	1.1
	Eastern Black Sea	55.1	5.1	1.2	2.0	0.8
	Eastern Anatolia	50.3	6.1	1.5	2.3	1.2
	Total Turkey	56.5	6.9	2.3	2.6	2.0

Sources: 1955 Census of Population, Table 35. Population 6 years and older.
 1960 Census of Population, Table 33a. Population 10 years and older.
 1965 Census of Population, Table 29. Population 11 years and older.

TABLE 7

POPULATION BY LAST SCHOOL GRADUATED
 TOTALS BY REGION AND CENSUS YEAR
 (%)
 FEMALES

<u>YEAR</u>	<u>Region</u>	<u>Primary</u>	<u>Secondary</u>	<u>Lycee</u>	<u>Vocational</u>	<u>Higher</u>
1950	Marmara	15.8	-	4.7	0.6	0.3
	Middle Anatolia	7.2	-	1.0	0.3	0.1
	Aegean	16.6	-	1.7	0.5	0.1
	Antalya	7.8	-	0.3	0.4	-
	Çukurova	6.1	-	0.9	0.4	-
	Western Black Sea	9.2	-	0.6	0.3	-
	Eastern Black Sea	3.8	-	0.3	0.1	-
	Eastern Anatolia	2.4	-	0.3	0.1	-
	Total Turkey	8.3	-	1.4	0.3	0.1
1960	Marmara	52.3	9.2	3.8	2.0	1.0
	Middle Anatolia	54.3	5.6	2.2	2.3	1.1
	Aegean	61.0	4.7	1.3	2.1	0.5
	Antalya	62.7	1.8	0.4	1.6	0.3
	Çukurova	58.7	4.1	1.3	2.9	0.7
	Western Black Sea	53.3	3.1	0.6	1.8	0.3
	Eastern Black Sea	54.2	2.8	0.4	1.6	0.3
	Eastern Anatolia	51.7	4.2	0.7	2.4	0.4
	Total Turkey	55.3	6.2	2.2	2.3	0.8
1965	Marmara	61.2	8.4	3.8	2.6	1.1
	Middle Anatolia	61.8	5.8	2.4	3.1	1.3
	Aegean	65.5	5.1	1.6	2.1	0.6
	Antalya	68.7	2.5	0.6	1.7	0.3
	Çukurova	58.8	5.8	1.8	3.2	0.6
	Western Black Sea	60.4	4.0	0.9	2.1	0.4
	Eastern Black Sea	59.8	3.5	0.7	2.0	0.4
	Eastern Anatolia	55.7	5.2	0.9	3.1	0.5
	Total Turkey	61.7	6.1	2.3	2.6	0.9

Sources: See, Table 6 - Males.

2. Female urban-rural secondary school attainment differentials are much less than male urban-rural rates, and

3. Rural female vocational education, especially in the East, is much greater in proportion than that of urban females and males both rural and urban.

1970 Census Data (15% sample results) tabulation below indicate sizeable increases in the percent of total population attaining at least primary education. From 1965 to 1970, the percentage of total population having completed primary education rose from 22.0 to 44.5 percent for males and 9.9 to 24.8 percent for females. Thus, as of most recent census results, 56.5 percent of all males and 30.3 percent of all females had completed some schooling.

Last School Graduated - 1970 Census
Population 11 years and older

	<u>Total</u>					
	<u>Literate but No Diploma</u>	<u>Primary</u>	<u>Secondary</u>	<u>Lycee</u>	<u>Vocational</u>	<u>Higher</u>
% Total Population	11.5	34.8	4.6	1.7	1.6	1.0
% Educated Population	20.9	62.9	8.2	3.0	2.9	1.8
	<u>Male</u>					
% Total Population	15.1	44.5	6.0	2.3	2.1	1.6
% Educated Population	21.0	62.1	8.4	3.2	2.9	2.2
	<u>Female</u>					
% Total Population	7.9	24.8	3.1	1.0	1.1	0.3
% Educated Population	20.6	64.6	8.0	2.7	3.0	0.9

Calculated from 1970 Population Census - Sampling Results, Table 3.

3. Educational Attainment of the Labor Force

The last education stock statistic available from Population Census data is that of the educational attainment of the Labor Force. Here again, the data provided is less than comprehensive and no adequate time series is available. Beginning in 1960, nationwide educational attainment data was tabulated by economic sector of activity, but even then illiterates and literates without diploma were aggregated together. Consequently, only the last census (1965) contains adequate labor force educational attainment figures.

Tables 9 and 10 show educational attainment by sector of economic activity for 1960 and 1965. These tables indicate two major points: (1) although the labor force is becoming more educated, the rates of educational attainment, especially for women, remain extremely low overall and (2) the more educated labor force (i.e. lycee, vocational, and higher) are highly concentrated in certain sectors of the economy. Tables 9 and 10 are somewhat self-explanatory and generally indicate both the relative levels and progress in educational attainment for each major sector of economic activity. The familiar male-female differentials are again dramatic.

To measure the concentration of educated labor force in each sector of economic activity, we simply distributed the total amounts of each educated group across the economic sectors; in other words, for example, what percentage of total illiterates were employed in agriculture. The results of these calculations are presented below:

SELECTED DATA ON EDUCATIONAL ATTAINMENT AND
ECONOMIC SECTOR OF EMPLOYMENT

Total Labor Force in 1965

	<u>Agri-</u> <u>culture</u>	<u>Manufac-</u> <u>turing</u>	<u>Commer-</u> <u>ce</u>	<u>Service</u> <u>s</u>	<u>All</u> <u>Others</u>	<u>Total</u>
% Total Labor Force	71.4	7.2	2.9	6.3	12.2	100.0
% Distribution of Illiterate or Educated Labor by Sector:						
Illiterate	90.7	2.3	0.5	1.6	5.0	100.0
Primary	52.3	14.7	4.9	8.2	20.0	100.0
Secondary	10.3	16.2	16.0	23.2	34.3	100.0
Lycee	3.1	10.5	22.7	32.0	31.7	100.0
Vocational	2.1	11.3	5.4	51.5	29.7	100.0
Higher	1.4	6.4	9.7	49.4	33.1	100.0

Note to reader: Subgroups by education are distributed across economic sectors, eg. rows rather than columns. For example, 90.7 percent of the illiterate labor force were employed in agriculture.

This indicates a very heavy concentration of illiterates in agriculture and educated, presumably managerial and white collar workers, in the commerce and service sectors. Female concentration rates were even more dramatic with 98 percent of all female illiterate workers in agriculture and over 30 percent of all higher education graduates in the service sector alone. Moreover, the polarization of illiterates in agriculture and highly educated workers in the service sector increased slightly between 1960 and 1965. Although the concentration of illiterates in agriculture might have been hypothesized, it is not clear whether the concentration of educated workers in services, rather than a more equal distribution including manufacturing, transport, utilities and commerce, is due to market (employer) effective demand or imperfections and rigidities in the labor market.

A regional breakdown of educational attainment by sector of activity was deemed beyond our present capacity and, in any case, probably would indicate an even greater concentration of illiterate farmers in Anatolian agriculture and educated service workers in Marmara, Aegean and Southwestern provinces. Attempts to classify educational attainment by occupational groups (managerial, salesmen, farmers, etc.), although tabulated, raised the ever present difficulty of distinguishing between skilled and unskilled workers, which census data do not address. About all that can be ascertained is that traditionally more skill-demanding occupations, especially technical and managerial, exhibited higher educational attainment rates.

4. Student Flow Analysis

Even cursory glances at Tables 11 through 15 yield insights as to the sizeable growth of education at all levels in Turkey. Period analysis over two decades, 1950 to 1960 and 1960 to 1970, appears to indicate three general trends: (1) in the decade 1960 to 1970 growth trends in graduates generally outstripped increases in students as compared to 1950 - 1960, a product of both increased capacity and, hopefully, efficiency; (2) although school building appears to lag behind increases in students, the sizeable increases in 1950 to 1960 secondary and high students should account for the large growth of higher education graduates over 1960 to 1970, thus indicating increased efficiency; and (3) except for primary education, overall student-teacher ratios have continually worsened, thereby exhibiting, at least in isolation, a diminution in quality of instruction:

See next page for "Percent Growth Over Period
1960 - 1970"

Percent Growth Over Period

	<u>1960-1970</u>			
	<u>Schools</u>	<u>Students</u>	<u>Teachers</u>	<u>Graduates</u>
Primary	57.9	75.6	118.5	130.6
Secondary	185.5	203.4	-	231.0
Lycee	139.2	219.2	-	198.2
Higher	67.3	163.9	160.8	238.9

	<u>1950-1960</u>			
Primary	40.0	77.3	74.3	88.6
Secondary	83.5	327.3	166.8	270.9
Lycee	120.5	241.2	115.9	115.1
Higher	61.8	163.1	108.8	93.9

Tables 16 and 17 present two statistics which indicate the composition of increased educational opportunities. Although data for school years 1967-1968 and 1968-1969 were not readily available, Table 16 appears to substantiate claims that educational opportunities are expanding at almost every level in Turkey; the data were derived by taking primary school enrollments for various years (E_t) and tabulating graduates at subsequent levels given normal anticipated terminal dates of G_{t+n} with n equal to 5, 3, 3 and 5 for primary, secondary, lycee and higher - respectively.

Table 11
 Primary School
 Total Schools, Students, Graduates and Teachers
 Various Years

Year	Schools	Students	Teachers	Graduates	Student/Teacher Ratio
1930	6,598	489,299	16,318	21,179	30.0
1935	6,275	688,102	14,949	37,700	46.0
1940	10,596	955,957	20,564	97,836	46.5
1945	14,010	1,357,740	27,317	150,883	49.7
1950	17,423	1,616,626	35,871	165,132	45.1
1955	18,724	1,983,668	42,169	198,407	47.0
1960	24,398	2,866,501	62,526	311,426	45.8
1965	30,466	3,924,326	85,653	451,504	45.8
1970	38,513	5,034,658	136,630	718,012	36.9

Sources: 1930-1965, Devlet İstatistik Enstitüsü, Milli Eğitim Hareketleri, 1927-1966.

1970; M.E.B., 67 il'de, Okul, Öğretmen, Öğrenci Sayıları.

Table 12
 Secondary School
 Total Schools, Students, Graduates and Teachers
 Various Years

Year	Schools	Students	Teachers	Graduates	Student/Teacher Ratio
1930	33	27,093	1,068	3,999	25.4
1935	191	52,386	2,403	8,248	21.8
1940	238	95,332	3,867	16,089	24.7
1945	247	65,608	3,931	12,389	16.7
1950	406	68,187	4,528	11,508	15.1
1955	573	133,217	6,385	21,167	20.9
1960	745	291,266	12,080	42,686	24.1
1965	939	433,210	15,024	73,986	28.8
1970	2,127	883,634	-	141,305	-

Sources: See Primary School, Table 11.
 1970 Source combines Secondary and Lycee level teachers.

Table 13

Lycee Education
Total Schools, Students, Graduates and Teachers
Various Years

Year	Schools	Students	Teachers	Graduates	Student/Teacher Ratio
1930	22	5,620	637	1,023	3.9
1935	66	13,622	1,029	2,172	13.2
1940	82	24,862	1,544	5,081	16.1
1945	83	25,515	1,817	6,236	14.1
1950	88	22,169	1,954	5,568	11.3
1955	123	33,412	2,476	8,024	13.5
1960	194	75,632	4,219	11,977	17.9
1965	240	114,641	5,753	23,227	20.0
1970	464	241,382	-	35,713	-

Source: See Primary School, Table 11

Table 14
 Technical and Vocational Education
 Total Schools, Students, Graduates and Teachers
 Various Years

Year	Schools	Students	Teachers	Graduates	Student/Teacher Ratio
1930	59	9,101	815	1,277	11.7
1935	64	9,229	755	1,823	12.2
1940	103	20,264	1,355	2,995	15.0
1945	244	52,248	3,826	8,271	13.7
1950	326	53,289	4,488	12,487	11.9
1955	415	72,675	5,294	13,913	13.7
1960	530	108,221	8,333	23,507	13.0
1965	787	182,476	11,236	34,576	16.2

Source: See Primary School, Table 11.

Table 15
 Higher Education
 Total Schools, Students, Graduates and Teachers
 Various Years

Year	Schools and Faculties	Students	Teachers	Graduates	Student/Teacher Ratio
1930	17	4,186	526	574	8.0
1935	18	7,277	743	1,009	9.8
1940	20	12,844	967	1,678	13.3
1945	28	19,502	1,365	2,221	14.3
1950	34	24,815	1,950	3,107	12.7
1955	40	36,998	2,453	3,124	15.1
1960	55	65,297	4,071	6,025	16.0
1965	94	97,308	5,836	10,611	16.7
1970	92	172,323	10,616	20,418	16.3

Sources: See Primary School, Table 11.

Such attempts are obviously crude and do not include possible repeaters and in-migrants. The greatest fall out within the system continues to be between the primary and secondary levels; yet the relative probability of advancing past primary education remains low indeed. The table is constructed such that all G_{t+n} 's presented are as of 1971 so that we can state, as of the most recent evidence, the 1970-1971 primary school graduating class, for example, represented about 81% of the 1966 enrollment class.

Alternatively, Table 17 begins by taking higher education graduates of various years and then distributes them backwards into graduating classes of each lower level. Thus, these tabulations clearly substantiate the general probabilities expressed by Kazamias, namely, the probability of reaching the top of the education ladder is extremely low at the primary school rung and increases rapidly at lycee level. Moreover, except for the very gradual increase of the primary level, no perceptible upward trend appears.

Attempts to create truly meaningful flow analyses were vitiated by a lack of adequate time series, especially at a provincial level. Indeed, we were unable to obtain 1967-1968 and 1968-1969 school year data from any readily available sources. Detailed school year data for 1965-1966, 1966-1967, 1969-1970 and 1970-1971 are presented in Appendix Tables 1 through 10. The authors decided to concentrate efforts in this

section on the primary school level. Such a reduction in scope of analysis seemed useful since primary school-level education is the foundation of the whole system and also a reduction in scope allowed more in-depth treatment.

The structure of primary education for 1965-1966 and 1970-1971 is presented in Table 18. The distribution figures are misleading in that they do not reveal growth trends. In this regard, it is noteworthy that the eastern half of Turkey (Black Sea regions and Eastern Anatolia) has generally experienced greater growth in all student statistics than the western half, though they still lag far behind overall (for example, primary school participation rates as of 1970-1971 for Marmara and Eastern Anatolia were 95.8 and 72.4 percent, respectively).

Percent Change Over Period 1965-1970

	<u>Schools</u>	<u>Enrollments</u>	<u>Students</u>	<u>Graduates</u>	<u>Teachers</u>
Marmara	15.9	16.8	20.1	42.1	45.8
Middle Anatolia	18.2	30.6	25.4	33.1	58.4
Aegean	14.3	18.7	14.3	31.3	93.6
Antalya	25.7	21.3	22.5	33.8	60.2
Çukurova	23.1	28.9	32.4	44.2	65.3
Western Black Sea	35.7	18.4	25.8	50.8	61.8
Eastern Black Sea	35.1	33.1	36.8	52.3	67.2
Eastern Anatolia	34.6	44.4	47.9	56.5	62.5
Total Turkey	25.5	29.2	28.9	41.8	56.2

Table 16

Percentage of Primary School Enrollment
Which Attained Each Level of Education
Various Years

Primary School Enrollment Year	Graduates from each level			
	Primary	Secondary	Lycee	Higher
1955	66.8	14.6	6.2	3.2
1956	72.5	15.5	6.0	4.8
1957	77.3	17.0	n.a.	
1958	76.1	16.5	n.a.	
1959	80.5	17.3	12.9	
1960	70.1	n.a.	10.5	
1961	74.7	n.a.		
1962	82.3	20.3		
1963	n.a.	21.4		
1964	n.a.			
1965	85.8			
1966	80.8			

Data for 1967-1968 and 1968-1969 not available

Table 17

Percentage of Graduates from each level
who Graduated from Higher Education
Various Years

Graduates of Higher Education in Year :	Graduated from:		
	Primary	Secondary	Lycee
1950	4.3	24.7	54.8
1960	4.0	28.1	62.9
1965	4.1	21.6	47.2
1966	4.2	20.9	45.7
1967	4.4	20.9	48.9
1968	4.9	22.2	57.0
1969	5.0	21.9	n.a.
1970	5.6	24.3	n.a.

Table 18

Structure of Primary Education
School Years 1965 and 1970
1965-1966

Region	% Distribution					Ratios		
	Schools	Enrollments	Students	Graduates	Teachers	Student/ Teacher	Enrollments/ Graduates	Primary - Sec. Dropou
Marmara	14.9	18.6	18.8	20.6	19.9	42.3	130.1	66.6
Middle Anatolia	24.1	24.6	25.1	25.9	24.6	45.6	136.6	67.2
Aegean	10.3	10.8	11.9	12.7	11.8	45.3	123.4	68.0
Antalya	3.3	3.2	3.3	3.6	3.2	45.9	130.5	72.0
Çukurova	5.5	7.0	7.0	7.0	6.7	45.3	143.9	62.2
Western Black Sea	6.8	4.8	4.6	4.5	4.4	47.3	152.1	72.1
Eastern Black Sea	14.1	13.4	13.1	12.1	12.6	46.2	160.3	68.9
Eastern Anatolia	20.9	18.1	16.1	13.5	16.7	43.2	193.1	63.8
Total Turkey	100.0	100.0	100.0	100.0	100.0	44.7	144.4	66.9
			<u>1970-71</u>					
Marmara	13.7	16.8	17.6	20.7	18.5	34.9	106.9	50.6
Middle Anatolia	22.7	24.8	24.5	24.3	24.9	36.1	134.1	52.4
Aegean	9.4	10.0	10.6	11.7	14.6	26.7	111.5	52.0
Antalya	3.3	3.0	3.1	3.4	3.3	35.1	118.3	56.3
Çukurova	5.4	7.0	7.2	7.1	7.1	37.1	128.6	50.0
Western Black Sea	7.4	4.4	4.5	4.8	4.5	36.8	119.4	61.7
Eastern Black Sea	15.2	13.8	13.9	13.0	13.5	37.8	140.0	56.8
Eastern Anatolia	22.5	20.2	18.5	14.9	17.4	30.3	178.1	52.1
Total Turkey	100.0	100.0	100.0	100.0	100.0	36.8	131.5	52.9

Data for the Aegean region are especially noteworthy, given an increase of only 14% in students and almost a doubling of teachers.

The ratio measures calculated are however more revealing. Between school years 65-66 and 70-71, all of the regions experienced favorable decreases in student/teacher and dropout ratios.^{3/} Except for a very modest decrease in Eastern Anatolia, student/teacher ratios advanced almost homogeneously throughout Turkey. Improvements in dropouts, although ubiquitous, were much greater in the west than in the east of Turkey. Thus, primary education in Turkey exhibited gradual improvements in both quality and efficiency, at least in so far as our crude indicators are representative.

The implicit capacity indicator (enrollments/graduates) is so constructed that a ratio of 100.0 indicates a "steadystate," meaning the institution produces as many outputs as it consumes inputs, even given obvious "recycling" of semi-finished product. In this regard, it is revealing that much of Western Turkey has approached this "steady state" and, given continued decreases in dropouts, could make near-term progress in achieving universal primary school education. On the other hand, high capacity indicators and high dropout ratios in the East indicate only long-term prospects of universal primary school education.

Finally, in an effort to reveal interregional variations in primary school structure more fully, the authors constructed a simple education model depicting the major policy oriented variables. The basic foundation of this model is analogous to an input-consumption equation where, on the left-hand side

total teacher inputs are equated to students' consumption of teacher services: $\frac{4}{}$

$$Tl = Sh$$

where T = total teachers

l = average teaching load, hours per week

S = total students

h = average hours taught per student per week.

Here capitalized variables are compiled from existing statistics and others (l and h) are derived. Since teaching load and hours taught per student data are not available, the authors decided to make a basic assumption concerning the program of instruction and then derive l and h independently. The program of instruction was disaggregated into teacher inputs for regular work (h_r) and extra, mostly administrative, teacher requirements (h_e). Thus, average hours taught per student per week can be expressed as:

$$h = (h_r + h_e) / C$$

where C = average class size. The last statistic utilized in the system is the student/teacher ratio, $R = S/T$.

In order to calculate interregional variations, the authors assumed a standard program of instruction of 36 regular teaching hours per week and 6 for administrative requirements, $h = (36 + 6) / C$. Part A of Table 19 presents the structure of the primary school system as of the 1970-1971 school year. Besides the aforementioned regional variations in student/teacher ratios, variations in average-class size are clear; contrast, for

example, Antalya and Çukurova regions. The derived teacher load levels (1) are clearly quite sensitive to changes in student/teacher ratios and average class size. Low load levels for the Aegean regions are a product of low student/teacher ratios whereas low levels for the Çukurova are determined by higher class sizes. On the other hand, high load levels for the Western Black Sea and Antalya regions are determined by low average class sizes.

Obviously, various combinations of assumptions and constraints could be "plugged" into the system in an effort to project future primary school structures. The authors herein present only one very simple alternative projection for only one year, school year 1971-1972. One assumption and two constraints were used. The projected increase in students was assumed to be equal to the average yearly increase over the period 1965 to 1970. Furthermore, as Table 19, Part B, indicates student/teacher ratios and average-class size were constrained to be equal to or less than certain arbitrarily-determined levels. Constraints on R and C variations obviously imply much more homogeneous levels of h and l. In terms of required additional teachers, the following summarizes the necessary increases:

Region	% Increase	
	<u>1971-1972</u>	
	Students	Teachers
Marmara	4.0	3.9
Middle Anatolia **	5.1	5.5
Aegean	2.9	3.0
Antalya	4.5	4.6
Çukurova**	6.5	9.7
Western Black Sea *	5.2	7.5
Eastern Black Sea**	7.4	12.7
Eastern Anatolia**	9.6	19.6

* Constrained as to student/teacher ratio only.

** Constrained as to student/teacher ratio and class size.

Table 19

Structure of Primary Education in Turkey
A. Initial Parameters for School Year 1970-1971

	Students	Teachers	Student/ Teacher Ratio	Average Class Size	Hours Taught Per Student	Teacher's Load
Marmara	883,709	25,342	34.9	47.9	0.87	30.3
Middle Anatolia	1,231,323	34,089	36.1	53.1	0.79	28.5
Aegean	533,440	19,953	26.7	49.0	0.85	22.7
Antalya	158,045	4,497	35.1	44.1	0.95	33.4
Çukurova	360,003	9,710	37.1	63.5	0.66	24.5
Western Black Sea	227,134	6,172	36.8	45.7	0.91	33.5
Eastern Black Sea	698,796	18,496	37.8	49.3	0.85	32.1
Eastern Anatolia	931,710	23,724	39.3	52.7	0.79	31.0
Total Turkey	5,034,658	136,630	36.8	51.0	0.82	30.2

B. Possible Structure for School Year 1971-1972

Marmara	919,057	26,334	34.9	47.9	0.87	30.4
Middle Anatolia	1,294,120	35,948	36.0	48.0	0.87	31.3
Aegean	548,910	20,558	26.7	48.0	0.87	23.2
Antalya	165,157	4,705	35.1	44.1	0.95	33.4
Çukurova	383,403	10,650	36.0	48.0	0.87	31.3
Western Black Sea	238,945	6,637	36.0	45.7	0.91	32.8
Eastern Black Sea	750,507	20,847	36.0	48.0	0.87	31.3
Eastern Anatolia	1,021,154	28,365	36.0	48.0	0.87	31.3

The constraints imposed obviously necessitated greater increases in teachers in the constrained than non-constrained regions, with those regions faced with both constraints even more so. The constraints were not severe for Middle Anatolia; therefore necessary increases in teachers were modest. The almost 10 percent requirement for the Çukurova was clearly a product of the decreased class sizes. On the other hand, relatively large increases in enrollments and severe constraints on R and C imposed extremely large requirements for new teachers in Eastern Black Sea and Eastern Anatolia.

This simple system could be useful in not only projecting the system given certain assumptions and constraints, but also in exploring possible interregional transfers of staff. In other words, if the required increases in teachers cannot be met, a modest diminution of student/teacher ratios in the Marmara and Aegean regions could supply part, though most likely not all, of the needs in the East. As the next section points out, this simple model could also be used to cost-out the necessary financing to reach more socially desired school structures. Finally, as a last effort to indicate interregional variations in education, the model was used to calculate a crude index of quality of instruction, $q = 1C$. The regional quality ranks are as follows:

1970-1971

Region	Index
Marmara	1,451.4
Middle Anatolia	1,513.4
Aegean	1,112.3
Antalya	1,472.9
Çukurova	1,555.8
Western Black Sea	1,531.0
Eastern Black Sea	1,582.5
Eastern Anatolia	1,633.7
Total Turkey	1,540.2

Although this quality index does not purport a discrete optimal number, a lower index implies greater quality and is so constructed such that the quality measure deteriorates as average class size and/or teacher load increase. As would be hypothesized, quality of instruction declines as one moves spatially across Turkey from west to east.

The design and testing of more elaborate, and useful, education models are left for other scholars to articulate. However, the analysis above meets present purposes and helps to elucidate persistent interregional variations in education attainments and school structures.

5. Financing of Education in Turkey

Financing education is clearly a subject which warrants separate detailed investigation; however, to round out our general "sector" approach, some general trends are presented. Education financing is important in that it yields insights as to the priorities and extent of commitment a government attaches to the sector and its various components. In fact, the composition and regional distribution of educational expenditures implicitly reveals the human resource development strategy of a government.

In their well-known book on human resource development, Harbison and Myers noted that the relatively advanced nations exhibited higher rates of allocation of national income to education than did most developing nations. Moreover, the composition of total education expenditures in the

advanced nations was more concentrated in higher-secondary and university level institutions than in the developing countries.^{5/} As the following data indicate, in Turkey, educational financing has averaged about three percent of national income during the 1960's, a figure up about 1/2 of one percent over the 1950-1959 average:

Year	Education Budget as % of National Income <u>(current factor cost)</u>
1960	2.21
1961	2.87
1962	2.83
1963	3.36
1964	3.45
1965	3.52
1966	3.23
1967	3.31
1968	3.45
1969	3.16
1970	2.71

More detailed data for education budgets and investments are presented in Table 20. Over the period 1960 to 1970, the average annual increase in the education budget was less than that of the national budget and consequently, education as a part of the national budget has not increased over the period. In fact, education as a percentage of the national budget has fallen relative to the 1963 through 1965 years.

Readily available data on the education budget are not disaggregated by level of instruction; therefore, we were unable to ascertain the

composition of the budget and/or any shifts in the magnitudes of expenditure patterns by levels of education. Data from more intensive studies, especially the OECD Mediterranean Project, indicate that historically primary education has accounted for about half of all education expenditures. The OECD study advocates a shift in the pattern of financing with greater emphasis to higher education (from about 15% of total education expenditures in 1960 to over 20% by 1968) with a more than corresponding decrease in the proportion to primary schools.

Although we were unable to discern the composition of educational expenditures to various regions in Turkey, adequate data on total funding exist. Since total education expenditures are by nature "lumpy" we calculated the aggregate per capita total and education expenditures for each region over the period 1963 through 1968. Such calculations, Table 21, yielded somewhat unexpected results. Although Eastern Anatolia and the Eastern Black Sea received lower per capita expenditures, the per capita levels were much more homogeneous than anticipated. Furthermore, the distribution of expenditures to the regions followed the existing population distribution much more closely than was expected. In fact, at least implicitly, the distribution of expenditures appears to be a function of the population distribution.

The high degree of homogeneity of funding might well be defended on grounds of social justice. However, if, as the Second Five Year

Development Plan advocates, regional discrepancies are to be decreased, a much more ambitious program of human capital creation in the lagging regions of Turkey may well be necessary. Although the authors do not possess adequate data to "cost-out" possible combinations of school financing requirements, the simple model presented in section 4 above might well represent a basis upon which a more socially desirable educational structure could be articulated and necessary financing calculated. Although present purposes do not allow investigation as to the adequacy of existing education financing levels, the apparent high growth capacity at all levels - as measured by the ratio of yearly enrollments to graduates - indicates increasing pressures to expand educational opportunities. This assumes of course no severe deterioration in the efficiency of educational institutions - as measured by student/teacher ratios, drop-outs, etc. - will be tolerated and, in all likelihood, pressures for increased educational opportunities will be compounded by demands for increased efficiency and quality of instruction. Moreover, ambitious attempts to expand educational opportunities can easily be vitiated by persistent high population growth.

Table 20
Financing Education
Budget and Investment
(TL Million)

<u>Turkish Fiscal Year</u>	<u>National Budget</u>	<u>Education Budget</u>	<u>Education as % of total</u>	<u>Year</u>	<u>National Investment</u>	<u>Education Investment</u>	<u>Education as % of total</u>
1960	7,281.7	981.2	13.4	1961	2,861.2	286.5	10.0
1961	8,678.7	1,338.5	15.4	1962	3,462.5	342.6	9.9
1962	10,114.9	1,477.2	14.6	1963	4,126.3	560.0	13.6
1963	12,101.6	2,008.0	16.5	1964	3,563.5	630.6	17.7
1964	13,484.3	2,205.1	16.3	1965	4,014.6	569.5	14.2
1965	14,421.4	2,419.1	16.7	1966	4,863.1	662.3	13.6
1966	16,775.3	2,594.1	15.4	1967	5,251.2	785.3	15.0
1967	18,813.5	2,920.1	15.5	1968	6,176.0	972.7	15.7
1968	21,612.2	3,354.1	15.5	1969	6,938.9	928.3	13.4
1969	25,697.0	3,427.7	13.3	1970	6,990.5	781.0	11.1
1970	28,860.3	3,377.4	11.7				

Source: Milli Eğitim Bakanlığı, Bütçe Raporu - 1972, Sy. 135 - 136.

Table 21

REGIONAL EDUCATION EXPENDITURE DATA
1963 - 1968

Region	Per Capita Expenditures		% Distribution			Education as % of Total
	Education	Total	Expenditures		1965 Population	
			Education	Total		
1. Marmara	465	1337	21.1	22.1	19.6	34.8
2. Middle Anatolia	435	1191	23.1	23.0	22.9	36.5
3. Aegean	415	1108	11.1	10.8	11.6	37.5
4. Antalya	467	1261	3.3	3.2	3.0	37.0
5. Çukurova	477	1114	6.6	5.5	6.0	42.8
6. Western Black Sea	422	979	4.6	3.9	4.7	43.1
7. Eastern Black Sea	405	988	12.0	10.7	12.8	41.0
8. Eastern Anatolia	407	1262	18.2	20.6	19.3	32.2
Total Turkey	432	1185	100.0	100.0	100.0	36.5

6. Analysis of Third Five Year Development Plan Targets and Projections

For most practical purposes, educational planning within the Third Five Year Development Plan (TFYDP) represents a major departure from earlier efforts. Three points especially are noteworthy: (1) the old five year Primary school level has been changed to an eight year Basic education system, thus incorporating Primary and Secondary (orta) schools; (2) the new education system will also alter in terms of course content, namely, a "streaming" concept is to be established whereby progressively more and more students are somehow to be channeled into vocational and technical education as contrasted to the more traditional lycee preparatory work for higher education; finally, (3) the TFYDP presents very explicit targets and projections. Neither the concepts employed nor the feasibility of implementation of the education reform strategies will be addressed in this paper; however, in the context of the historical data presented before, targets and projections of the TFYDP are summarized.

Plan projections for the new basic education level are presented in Table 22. During the Plan period, the projections indicate (1) achievement of universal schooling at the first five years of basic education, up from 88.1 percent in 1971 (Appendix Table 10), (2) an increase of schooling rates in the second step of basic education from 33.9ⁱ percent

TABLE 22 DIRECTIONS OF BASIC EDUCATION - PLAN PROJECTIONS
 School Years 1974-1978
 (000)

School Year ending	First Five Years					Last three years			
	School age Pop. (7-12)	New Enrollments	Total Students	% in School	No. of Classes	School age Pop. (13-15)	Total Students	% in School	% pass to Lycee
1974	5770.2	1091	5193.1	90.0	129.8	2642.2	1170.5	44.3	43
1975	5878.9	1105	5408.5	92.0	135.2	2692.3	1203.8	44.9	34
1976	5988.8	1128	5689.3	95.0	142.2	2743.2	1251.9	46.0	32
1977	6111.9	1160	5923.5	97.0	148.2	2792.8	1343.3	48.1	33
1978	6242.7	1182	6242.7	100.0	155.1	2843.0	1441.4	50.7	32

Source: Third Five Year Development Plan Tables 550, 571, and 573

in 1971 to 50.7 percent in 1978, and (3) a decrease in the proportion of basic education graduates who advance to the lycee. The last trend is presumed to be a product of the "streaming" concept mentioned above.

Universal schooling in the first level of basic education, as a basic tenet of the TFYDP, deserves closer analysis. The anticipated aggregate increases implicit in first level basic education projections are tabulated below:

<u>Time Period</u>	<u>Percent Increases Over Plan Period</u>				
	<u>School Age Population (7-12)</u>	<u>New Enrollments</u>	<u>Students</u>	<u>Classes</u>	<u>Teachers</u>
1971 to 1974	0.9	15.6	3.1	31.6	22.0
1974 to 1978	8.2	25.2	24.0	58.2	128.1

From these, two points are worthy of mention. First, the population growth rates used appear to be quite low. Whereas the TFYDP projects the population ages 7 through 12 at 8.2 percent over the period 1974 to 1978, recent census data presented below indicate much higher historical growth rates:

<u>Census Year</u>	<u>Number (000)</u>	<u>Percent Change</u>
1950	2,917.7	-
1955	3,253.1	11.5
1960	4,275.4	31.4
1965	5,063.6	18.4
1970 *	6,024.6	19.0

* 15% sample results

The 1970 Census sample results also indicate that the targeted 1977 school age population is upon us already: obviously, the goal of universal schooling will be more difficult to achieve than implied in the Plan projections. Secondly, in terms of the regional model presented in section 4, implications of the fairly large additions to the stock of classes and teachers over the plan period may be summarized as follows:

<u>School Year</u>	<u>Average Class Size</u>	<u>Student/Teacher Ratio</u>
1970-1971	51.0	36.8
1973-1974	40.0	31.2
1977-1978	40.0	20.0

In other words, although the Plan anticipates a 58.2 percent increase in classes and presumably also some more schools, the average class size will not be altered. On the other hand, the 128.1 percent increase in teachers will noticeably affect the student/teacher ratio, ie. a 45.7 percent decrease should be achieved. Although provincial level Plan projections are not

readily available, it can be presumed that, if the regional imbalances summarized in Section 4 above are to be reduced, the distribution of new teachers will need to be more concentrated in Eastern Anatolia and the Eastern Black Sea regions than in the past. On the other hand, it must be noted, a distribution of new classroom and teacher supply which favors the western provinces will widen the existing regional imbalances.

Projections for middle school and higher education are summarized in Table 23. Here, the "streaming" concept becomes quite apparent. Over the plan period, general lycee students are projected to increase by only 11.0 percent, reaching an anticipated maximum schooling rate of 13.4 percent in the second year of the Plan. The number of technical lycee students is, however, projected to increase by 91.9 percent over the Plan period with a gradual increase in schooling rates. In other words, the composition of total middle level students is expected to shift from over 67 percent general in 1973-1974 to only 53 percent general at the end of the Plan in 1977-1978. As Table 23 indicates, the Plan also anticipates a modest increase in participation in higher education.

Although the authors are not qualified to assess the adequacy of education financing in the Plan, certain trends should be mentioned. As pointed out in Table 24, new investments in education during the Third Five Year Development Plan are projected at 12,400 million TL, a rate of increase of 44.2 percent over the adjusted Second Plan levels. However,

TABLE 23

PLAN PROJECTIONS FOR MIDDLE AND HIGHER EDUCATION
SCHOOL YEARS 1974 - 1978
(000)

School Year	M I D D L E S C H O O L				H I G H E R E D U C A T I O N	
	Lycee-General		Lycee-Technical		Total Students	% in School
	Total Students	% in School	Total Students	% in School		
1974	326.2	13.2	160.7	6.5	208.0	7.1
1975	338.4	13.4	191.9	7.6	232.0	7.6
1976	345.6	13.4	229.5	8.9	252.0	8.0
1977	352.6	13.4	268.4	10.2	275.0	8.5
1978	359.4	13.4	308.4	11.5	298.0	9.0

SOURCE: Third Five Year Development Plan, Table 550.

the share of total investment to be allocated to education in the Third Five Year Development Plan is projected at only 5.0 percent, an almost two percentage point decrease from the 6.7 percent share allocated to education under the Second Plan. The following data summarize education investments in the three Plans:

	<u>Amount Million TL 1971 Prices</u>	<u>Percent Change Over Previous Plan</u>	<u>Percent Share of Total Planned Investments</u>
First Five Year Plan	6,251.8	-	6.6
Second Five Year Plan	8,602.0	37.6	6.7
Third Five Year Plan	12,400.0	44.2	5.0

At least in isolation, this trend appears to be inconsistent with rising social and economic demands for education within the context of Turkey's present level of economic development. The proposed distribution of education investments by level does, however, appear to be consistent with and further highlights the Plan emphasis on basic education and technical and vocational schools.

In summary, although the Plan may be criticized for the low population growth rate estimates used in projecting basic education and relative decrease in the share of investments going to education, explicit targets have been articulated. These targets and projections may now be utilized by both scholars and planners to make more detailed projections and evaluate trends during the Plan period.

Table 24

Third Five Year Development Plan
New Education Investments

<u>Level</u>	<u>Amount</u> <u>Million TL.</u> <u>1971 Prices</u>	<u>Percent</u> <u>of</u> <u>Total</u>
Basic	3,780.0	30.1
Lycee - General	430.0	3.5
Lycee - Technical	2,600.0	20.2
Commercial and Other		
Practical Schools	2,150.0	17.3
Universities	1,750.0	14.1
Other Higher Education	500.0	4.0
Culture, Youth, and Sports	870.0 ^{1/}	7.0
All Others	320.0	3.8
Total	12,400.0 ^{2/}	100.0

Source: Third Five Year Development Plan, Table 554

^{1/} The plan incorrectly lists this as 87.0 million.

^{2/} Actual total is 14000.0; however, 1600.0 million TL represents unidentified, continuing Second Five Year plan projects and is therefore herein deducted.

Moreover, the Plan projections, both in terms of student flows and resource allocation, are in apparent conformity with projected skilled manpower shortages and it can be presumed that the concept of channelling more students into terminal programs of middle-level vocational and technical education will in part alleviate the skilled manpower gaps.

7. Summary

From the outset, the purpose of this paper was to present a historical analysis of existing statistical evidence concerning regional variations in educational attainment; this modest aim appears to have been achieved. Where possible, we also have attempted to identify some of the key policy issues within educational planning; likewise, some of the major targets and projections of the Third Five Year Development Plan are presented and implications investigated. A simple model is constructed which depicts the fundamental parameters describing regional education structures. The model is used only as an indicator of the type of analysis which could be extended to all levels of education.

As in most other studies of this nature a great deal of further research is necessary. At the macroeconomic level, coordination of education planning and manpower planning could be approached through research on the education and skill components required of certain manpower categories given various mixes of technology employed. The logic of such investigation

implies that rational choices of technology should be geared to the country's ability to supply the required complementary skilled labor factor inputs as well as capital and supporting institutions. Analysis of urban-rural real wage differentials and rate of return computations could be useful in articulating overall incomes policies, including minimum wage legislation, and benefit/cost calculations inherent in designing social programs. Here, particular attention should be paid to the potential effects of additional education and training on income distribution. Moreover, socio-economic factors explaining demand for various levels of education should be of concern to economic planners, especially if resource allocations are to be geared to meeting the "felt-needs" of society.

Various microeconomic studies also appear to be necessary. The model and supporting data presented in section 4 could easily be refined and extended to examine what factors explain regional variations in the quality of student output, as measured by standardized university entrance examinations. Such an inquiry could be of valuable assistance to education planners both in terms of allocating existing inputs and determining necessary measures to improve educational opportunities, in quantitative and qualitative aspects, between regions. Finally, research on the correlates of educational attainment might^{be}/of interest to social planners who are investigating trends

of migration and urbanization, demand for improved health and family planning assistance, and overall rural development measures. All of these research possibilities clearly highlight the need for scholars and planners to begin formulating the appropriate questions and testable hypotheses which can lay the foundation for future planning and implementation efforts.

EXHIBIT I

<u>REGION</u>	<u>1. MARMARA</u>	<u>2. MIDDLE ANATOLIA</u>	<u>3. AEGEAN</u>	<u>4. ANTALYA</u>	<u>5. ÇUKUROVA</u>	<u>6. WESTERN BLACK SEA</u>	<u>7. EASTERN BLACK SEA</u>	<u>8. EASTERN ANATOLIA</u>
<u>PROVINCE:</u>	Balikesir Bilecik Bursa Çanakkale Egirne Istanbul Miklarelili Nocceci Sakarya Tekirdađ	Afyon Ankara Çankiri Çorum Eskişehir Kayseri Kirşehir Konya Kütahya Nevşehir Niğde Sivas Yozgat	Aydin Denizli Izmir Manisa Muğla Uşak	Antalya Durdur Isparta	Adana Hatay İçel	Bolu Kastamonu Zonguldak	Amasya Artvin Ciresun Gümüşhane Ordu Rize Samsun Sinop Tokat Trabzon	Adiyaman Ağrı Bingöl Bitlis Diyarbakir Elazığ Erzincan Erzurum Gaziantep Hakkari Hars Malatya Karaş Mardin Muş Siirt Tunceli Urfa Van

APPENDIX A

22		15
21		14
20	Higher Education	13
19		12
18		11
17	Lycee	10
16		9
15		8
14	Secondary	7
13		6
12		5
11		4
10	Primary	3
9		2
8		1
7		
Age Level		Grade Level

Appendix Table 1
 Student Flow Analysis
 Part I - Primary School
 1965 - 1966

<u>Region</u>	<u>Schools</u>		New Enrollments	<u>Students</u>		Graduates	Teachers	Student/ Teacher Ratio	New Enrollments/ Graduates
	Village	Total		Village	Total				
Marmara	3,968	4,559	135,916	409,427	735,731	104,479	17,385	42.3	130.1
Middle Anatolia	6,764	7,397	179,471	643,229	981,836	131,345	21,519	45.6	136.6
Aegean	2,346	3,166	79,195	302,692	466,541	64,197	19,304	45.3	123.4
Antalya	928	1,016	23,570	93,666	128,964	18,056	2,807	45.9	130.5
Çukurova	1,516	1,696	51,920	157,927	271,936	35,458	5,873	46.3	143.9
Western Black Sea	1,987	2,096	34,956	141,118	180,528	22,981	3,814	47.3	152.1
Eastern Black Sea	4,016	4,332	98,242	393,999	510,777	61,303	11,059	46.2	169.3
Eastern Anatolia	5,933	6,425	132,393	435,334	630,111	68,546	14,600	43.2	193.1
Total Turkey	27,955	30,690	730,988	2,568,442	3,906,424	506,370	87,456	44.7	144.4

Source: D.I.E. Milli Eğitim İstatistikleri - İlköğretim, 1965-1967

Appendix Table 2

Student Flow Analysis
Secondary School
1965-1966

Region	Schools	New				Resmi Bağımsiz		
		Enrollments	Students	Graduates	Teachers	Student/ Teacher Ratio	Drop Out Ratio	New Enrollments/ Graduates
Marmara	163	26,420	62,120	11,725	2,338	26.6	44.6	225.3
Middle Anatolia	204	31,924	73,772	14,728	3,007	24.5	39.9	215.8
Aegean	107	16,337	35,621	6,521	1,427	25.0	40.2	250.5
Antalya	31	3,430	7,428	1,512	298	24.9	24.7	226.9
Çukurova	44	8,579	19,897	3,606	703	22.1	50.9	232.1
Western Black Sea	40	4,348	10,172	1,940	414	24.6	27.9	224.1
Eastern Black Sea	95	14,292	32,320	6,338	1,155	28.0	40.2	225.5
Eastern Anatolia	149	19,771	42,025	8,375	1,739	24.2	43.8	236.1
Total Turkey	836	125,691	283,765	54,835	10,995	25.8	41.5	229.2
						Resmi Bağlı a/		
Marmara	33	8,439	22,212	4,195	-	-	38.5	201.2
Middle Anatolia	27	11,117	27,891	5,810	-	-	29.3	191.3
Aegean	13	4,193	10,684	2,132	280	38.2	33.1	195.7
Antalya	5	1,625	4,037	774	-	-	38.6	209.9
Çukurova	8	4,824	11,400	1,813	265	43.0	63.3	266.1
Western Black Sea	6	2,072	5,183	955	-	-	33.3	217.0
Eastern Black Sea	15	4,775	11,761	2,154	-	-	27.5	221.7
Eastern Anatolia	19	5,011	11,242	2,129	-	-	33.3	235.9
Total Turkey	126	42,056	104,410	19,962	-	-	35.5	210.7

a/ Many provinces aggregated Resmi Bağlı and Lise teachers; consequently detailed statistics are not available

Source: D.I.E. Milli Eğitim İstatistikleri - Orta Öğretim, 1965-1967

Student Flow Analysis
Part I - Primary School
1966-1967

Appendix Table 3

<u>Region</u>	<u>Schools</u>		New Enrollments	<u>Students</u>		Graduates	Teachers	<u>Student/ Teacher Ratio</u>	<u>New Enrollments/ Graduates Ratio</u>
	<u>Village</u>	<u>Total</u>		<u>Village</u>	<u>Total</u>				
Marmara	4,048	4,675	152,319	408,544	770,203	111,222	18,705	41.5	137.0
Middle Anatolia	7,013	7,666	223,479	683,439	1,047,405	128,770	23,336	44.9	173.5
Aegean	2,906	3,245	94,287	312,789	483,227	58,344	11,063	44.1	161.6
Antalya	990	1,082	29,100	100,040	137,446	19,020	3,098	44.4	153.0
Çukurova	1,580	1,771	62,674	169,521	291,451	37,637	6,598	44.2	166.3
Western Black Sea	2,155	2,269	40,739	153,416	195,348	24,904	4,269	45.8	163.6
Eastern Black Sea	4,342	4,676	126,844	435,196	562,320	67,542	11,102	50.7	187.8
Eastern Anatolia	6,324	6,842	154,577	475,811	690,920	70,726	15,919	43.4	218.6
Total Turkey	29,358	32,226	884,019	2,733,756	4,189,820	513,215	94,085	44.5	170.6

Source: See Primary School, 1965-1966

Appendix Table 4

STUDENT FLOW ANALYSIS
Secondary School
1966-1967

Region	Schools	<u>Resmi Bağımsiz</u>			Teachers	Student/ Teacher/Ratio	Drop Out Ratio	New Enrollment Graduates
		New Enrollments	Students	Graduates				
Marmara	180	31,697	72,715	11,827	2,539	28.6	61.4	268.0
Middle Anatolia	233	39,512	90,381	15,592	3,196	28.3	49.6	253.4
Aegean	123	19,205	43,066	7,027	1,635	26.3	55.7	273.3
Antalya	34	4,248	9,476	1,495	312	30.4	53.5	284.1
Çukurova	49	11,428	23,893	3,655	779	30.7	62.3	312.7
Western Black Sea	47	5,321	12,686	2,206	474	26.8	50.3	241.2
Eastern Black Sea	107	16,406	34,773	5,948	1,197	29.1	43.2	275.9
Eastern Anatolia	185	22,240	47,624	9,008	1,896	25.1	47.5	246.9
Total Turkey	958	150,057	334,614	56,758	12,028	27.8	52.9	264.4
			<u>Resmi Bağlı a/</u>					
Marmara	39	11,242	28,112	5,175	-	-	50.5	217.2
Middle Anatolia	32	11,975	31,067	5,712	-	-	47.7	209.6
Aegean	17	5,287	12,859	2,261	364	35.3	49.1	233.8
Antalya	6	1,798	4,370	735	117	37.4	49.4	244.6
Çukurova	9	4,771	12,997	2,161	216	60.2	50.8	220.9
Western Black Sea	6	2,635	6,043	897	129	46.8	30.2	297.1
Eastern Black Sea	21	7,879	17,952	2,962	-	-	48.0	266.0
Eastern Anatolia	26	6,980	16,530	2,912	-	-	51.5	230.7
Total Turkey	156	52,567	129,930	22,805	-	-	49.0	230.5

a/ Many provinces aggregated Resmi Bağlı and Lise teachers; consequently, detailed statistics are not available.

Source: See Secondary School 1965-1966.

Appendix Table 5

STUDENT FLOW ANALYSIS
PART I - SCHOOLS AND TEACHERS
1969-1970 School Year

Region	No. of Villages	Vil- lages with no Schools	P r i m a r y					Secondary		Lycee		Higher	
			Schools		Total	Teachers		Schools	Teachers	Schools	Teachers	Schools	Teachers
			Village	Total	Classes	Village	Total						
Marmara	4037	199	4355	5187	17258	12107	24034	403	3746	213	5762	30	3465
Middle Anatolia	8048	598	7864	8681	22600	19560	31077	458	3469	191	4851	29	4484
Aegean	3142	177	3188	3576	10559	9206	14377	273	1994	102	2643	15	935
Antalya	1038	48	1131	1236	3410	3053	4316	77	449	36	989	1	5
Çukurova	1652	102	1825	2066	5586	5083	9200	101	820	60	1459	4	60
Western Black Sea	2628	308	2502	2634	4741	4261	5729	84	580	42	828	-	-
Eastern Black Sea	5055	571	5237	5624	13549	12703	16712	217	1194	95	1895	3	154
Eastern Anatolia	10009	3027	7678	8334	16952	13045	20604	299	1725	138	2317	5	514
Total Turkey	35422	4960	33772	37330	95055	80045	127391	1892	13979	878	20241	89	9574

Source: Milli Eğitim Bakanlığı, 67 ilde okul, Öğretmen, Öğrenci Sayıları - 1969-1970 (Ankara: 1971).

Appendix Table 6

STUDENT FLOW ANALYSIS
PART II - STUDENTS
1969-1970 School Year

Region	P r i m a r y						S e c o n d a r y		
	New Enrollments		Students		Graduates		New		
	Village	Total	Village	Total	Village	Total	Enrollments	Students	Graduates
Marmara	72060	149655	433672	879565	63700	128143	64829	174403	27140
Middle									
Anatolia	139905	223196	764515	1220068	93471	155528	75220	203435	34893
Aegean	58811	93489	335714	534412	46175	76601	36714	97289	15376
Antalya	20652	30235	113637	156961	14654	21115	9071	23466	5856
Çukurova	36901	65228	195983	350678	24093	44033	23910	63729	9491
Western									
Black Sea	26266	41719	171644	226709	21779	29579	11110	30678	5359
Eastern									
Black Sea	99950	125410	530184	682574	61887	82843	35098	93206	14731
Eastern									
Anatolia	111393	173439	580052	883772	59611	93726	44452	114661	21137
Total Turkey	571065	902223	3125500	4934842	385480	631479	301168	800900	133360

Source: See Student Flow Analysis, Part I.

Appendix Table 6 (Cont.)

STUDENT FLOW ANALYSIS
PART II - STUDENTS
1969-1970 School Year

	Lycee			Higher		
	New Enrollments	Students	Graduates	New Enrollments	Students	Graduates
Marmara	28550	81944	14878	15113	76973	6808
Middle						
Anatolia	33412	89057	16134	14982	58413	6648
Aegean	15364	42118	7335	3875	14007	1035
Antalya	3889	9997	2047	80	80	-
Çukurova	10558	29000	5409	984	3234	-
Western						
Black Sea	4965	13847	2616	-	-	-
Eastern						
Black Sea	13820	35861	6695	502	1650	189
Eastern						
Anatolia	18214	47253	8521	1048	4452	353
Total						
Turkey	128543	350516	63872	36584	159919	15023

Source: See Student Flow Analysis, Part I.

Appendix Table 7

STUDENT FLOW ANALYSIS
PART III - INDICATORS
1969-1970 School Year

Region	P r i m a r y				S e c o n d a r y				L y c e e				
	% in School Female	% in School Total	Student/ Teacher Ratio	New Enroll- ments/ Graduates	% in School Female	% in School Total	Student/ Teacher Ratio	New Enroll- ments/ Graduates	Primary- Sec. Drop-out	% in School Female	% in School Total	Student/ Teacher Ratio	New Enroll./ Graduates
Marmara	97.5	99.9	36.6	116.8	32.1	43.5	46.6	238.9	49.4	15.9	21.0	14.2	191.9
Middle Anatolia	89.0	96.2	39.3	143.5	20.2	36.6	58.6	215.6	51.6	12.2	19.7	18.4	207.1
Aegean	91.1	94.8	37.2	122.0	26.4	37.4	48.8	238.8	52.1	13.8	18.7	15.6	209.5
Antalya	89.6	95.7	36.4	143.2	17.3	32.6	52.3	154.9	57.0	8.3	17.3	10.1	190.0
Çukurova	83.1	93.1	38.1	148.1	26.0	40.6	77.7	251.9	45.7	13.8	22.3	19.9	195.2
Western Black Sea	87.7	96.3	39.6	141.0	12.2	26.8	52.9	207.3	62.4	8.1	16.2	16.7	189.8
Eastern Black Sea	73.3	88.3	40.8	151.4	13.2	30.3	78.1	238.3	57.6	6.5	15.0	18.9	206.4
Eastern Anatolia	52.3	71.5	42.5	185.0	9.9	23.7	66.5	210.3	52.6	6.7	13.6	20.4	213.8
Total Turkey	80.0	89.7	38.7	142.9	19.7	34.0	57.3	225.8	52.3	11.1	18.1	17.3	201.3

APPENDIX TABLE 8
Student Flow Analysis
Part I - Students and Teachers
1970-1971 School Year

<u>Region</u>	<u>No. of Villages</u>	<u>Villages with No School</u>	<u>Primary</u>				
			<u>Schools</u>		<u>Total Classes</u>	<u>Teachers</u>	
			<u>Village</u>	<u>Total</u>		<u>Village</u>	<u>Total</u>
Marmara	4,358	185	4,431	5,285	18,461	12,775	25,342
Middle Anatolia	8,181	489	7,744	8,740	23,177	21,674	34,089
Aegean	3,161	165	3,211	3,613	10,883	9,269	19,953
Antalya	1,052	35	1,172	1,277	3,580	3,282	4,497
Çukurova	1,669	80	1,852	2,088	5,665	5,610	9,710
Western Black Sea	2,633	270	2,699	2,844	4,967	4,625	6,172
Eastern Black Sea	5,117	558	5,444	5,851	14,161	14,164	18,496
Eastern Anatolia	10,206	2,872	7,964	8,649	17,668	15,271	23,724
Total Turkey	35,997	4,510	34,837	38,513	98,647	86,370	136,630

<u>Region</u>	<u>Secondary</u>		<u>Lycee</u>		<u>Higher</u>	
	<u>Schools</u>	<u>Teachers</u>	<u>Schools</u>	<u>Teachers</u>	<u>Schools</u>	<u>Teachers</u>
	Marmara	442	1,328	247	6,728	28
Middle Anatolia	527	424	224	7,958	22	4,865
Aegean	269	381	117	4,458	14	1,128
Antalya	86	39	40	954	-	-
Çukurova	116	302	66	2,041	4	87
Western Black Sea	96	110	44	1,154	-	-
Eastern Black Sea	260	68	106	2,986	2	143
Eastern Anatolia	329	132	155	4,228	3	518
Total Turkey	2,127	2,788	1,001	32,808	92	10,616

Source: See, Student Flow Analysis - 1969, Part I

Appendix Table 9
Student Flow Analysis
Part II - Students
1970-1971 School Year

<u>Region</u>	<u>PRIMARY</u>						<u>SECONDARY</u>		
	<u>New Enrollments</u>		<u>Students</u>		<u>Graduates</u>		<u>New</u>	<u>Students</u>	<u>Graduates</u>
	<u>Village</u>	<u>Total</u>	<u>Village</u>	<u>Total</u>	<u>Village</u>	<u>Total</u>	<u>Enrollments</u>		
Marmara	75,977	158,712	426,434	883,709	71,317	148,427	73,316	195,633	25,567
Middle Anatolia	147,069	234,421	758,057	1,231,323	102,810	174,806	83,170	220,808	38,031
Aegean	60,384	94,001	341,300	533,440	49,810	84,295	40,481	109,058	17,904
Antalya	20,842	28,579	114,755	158,045	16,928	24,157	10,562	26,135	4,205
Çukurova	35,912	65,769	200,263	360,003	27,987	51,127	25,082	67,471	11,867
Western Black Sea	31,333	41,393	171,956	227,134	25,412	34,662	13,287	33,898	5,868
Eastern Black Sea	102,096	130,728	546,373	698,796	70,337	93,352	40,298	99,280	16,317
Eastern Anatolia	121,796	191,115	545,561	931,710	66,955	107,304	51,445	129,970	21,850
Total Turkey	594,811	944,328	3,168,513	5,034,658	431,702	718,012	338,283	883,634	141,305
	<u>LYCEE</u>			<u>HIGHER</u>					
	<u>New</u>	<u>Students</u>	<u>Graduates</u>	<u>New</u>	<u>Students</u>	<u>Graduates</u>			
	<u>Enrollments</u>			<u>Enrollments</u>					
Marmara	30,518	89,563	15,306	16,774	80,411	9,745			
Middle Anatolia	34,589	104,285	17,965	15,317	63,326	8,227			
Aegean	17,368	47,500	7,755	4,645	16,336	1,396			
Antalya	3,768	10,060	1,979	80	145	-			
Çukurova	11,544	31,792	6,027	1,246	4,416	-			
Western Black Sea	5,105	15,455	2,815	-	-	-			
Eastern Black Sea	15,194	41,142	7,048	693	2,042	265			
Eastern Anatolia	19,318	54,707	9,635	395	1,076	116			
Total Turkey	128,755	392,717	67,455	40,772	172,323	20,418			

Source: See, Student Flow Analysis - Part I

Appendix Table 10
 Student Flow Analysis
 Part III - Indicators
 1970 - 1971 School Year

<u>Region</u>	<u>Primary</u>			<u>Secondary</u>			<u>Lycee</u>	
	<u>% in School</u>	<u>Student/Teacher Ratio</u>	<u>New Enrollments/Graduates</u>	<u>% in School</u>	<u>New Enrollments/Graduates</u>	<u>Pri-Sec. Dropout Ratio</u>	<u>% in School</u>	<u>New Enrollments/Graduates</u>
Marmara	95.8	34.9	106.9	46.5	286.3	50.6	21.8	199.4
Middle Anatolia	93.4	36.1	134.1	38.0	218.7	52.4	22.5	192.5
Aegean	90.9	26.7	111.5	40.0	226.1	52.0	20.1	224.0
Antalya	92.4	35.1	118.3	34.6	251.2	56.3	16.7	190.4
Çukurova	91.1	37.1	128.6	40.9	211.4	50.9	22.2	191.5
Western Black Sea	93.4	36.8	119.4	29.4	226.4	61.7	17.5	181.3
Eastern Black Sea	87.6	37.8	140.0	30.7	247.0	56.8	16.4	215.6
Eastern Anatolia	72.4	39.3	178.1	25.8	235.4	52.1	15.3	200.5
Total Turkey	88.1	36.8	131.5	33.9	239.4	52.9	16.8	190.9

Source: See, Student Flow Analysis, Part I

EDUCATION SECTOR REVIEW - TURKEY
Selected References on Turkish Education and Training

(English Language Sources)

1. J. Blum, "Planning Models for the Calculation of Educational Requirements for Economic Development: Turkey," in O.E.C.D., Econometric Models of Education: Some Applications (Paris: O.E.C.D., 1965).
2. Necmettin Candan, "The Turkish Educational Situation," in ESSCB, Education as a Factor of Accelerated Economic Development, op cit. pp 42-51.
3. Jefferson N. Eastmond, Educational Attainment in Turkey, 1964 (Ankara: Ministry of Education, Research and Measurement Bureau, 1964).
4. Economic and Social Studies Conference Board (ESSCB), Education as a Factor of Accelerated Economic Development (Istanbul: ESSCB, 1965).
5. K. Eide, The Cost Structure of Turkish Higher Education (Ankara: State Planning Organization, 1959).
6. _____, Planning of Turkish Higher Education - Comments and Suggestions (Ankara: State Planning Organization, 1970).
7. Andreas M. Kazamias, Education and the Quest for Modernity in Turkey (Chicago: University of Chicago Press, 1965).
8. _____, "Education for Planned Development in Turkey: A Critical Appraisal of the Technical-Vocational Education Policy," USAID mimeo, 1966
9. Anne O. Krueger, "Turkish Education and Manpower Development: Some Impressions," in Duncan Miller, ed., Essays on Labor Force and Employment in Turkey (Ankara: USAID, 1971), pp. 225-259.
10. David McAllister, "Papers on Turkish Education" mimeo, USAID Nov. 1967.
11. Nezih H. Niyzi, "Management Training: Turkish Experience," in ESSCB, Education as a Factor of Accelerated Economic Development, op cit. pp.380-4
12. Organization for Economic Cooperation and Development (O.E.C.D.), The Mediterranean Regional Project: Planning Education for Economic and Social Development (Paris: O.E.C.D. 1962)
13. O.E.C.D. Education and Research in Italy, Greece and Turkey, (Paris:OECD, undated).

14. M. T. Ozelli, "The Estimates of Private Internal Rates of Return on Educational Investment in the First Turkish Republic, 1923-1960," International Journal of Middle East Studies, Vol. I, 1969. pp. 154-176.
15. E. Frank Price, "AID Educational Assistance to Turkey, 1957-1970," Mimeo, USAID, 1970.
16. Richard D. Robinson, High-Level Manpower in Economic Development - The Turkish Case (Cambridge, Mass.: Harvard University Press, 1957)
17. Ömer C. Sarc, "Higher Education in Turkey," in ESSCB, Education as a Factor of Accelerated Economic Development, op.cit., pp. 101-120.
18. UNESCO, "Turkey: Report on Priority Projects for the Development of Education and Training," Paris, 1969.
19. William Wrinkle, "Analysis of Turkish Education Status and Plans," Mimeo, USAID, February 1964.

NOTE: Ministry of Education data reference documents are not listed herein.

FOOTNOTES

1. The authors are, respectively, Assistant Program Economist and Technical Specialist Economist with the United States Agency for International Development, Ankara, Turkey; however, this paper is the personal effort of the authors and does not necessarily represent views or opinions of the Agency or United States Government.
2. [7, p. 171]
3. Drop out ratios used in this paper are not entirely accurate in that, due to lack of a time series and for ease of computation the authors took primary graduates in time t less secondary enrollments as of the same year divided by graduates of primary in t .
4. To keep the analysis simple, the authors have projected only one year into the future and assumed no constraints on new teacher supply. A more accurate formulation might take the form as follows:

$$T_t^{\lambda} l_t = S_t^{\lambda} h_t$$

where, λ is the "possible" growth rate in teacher supply (a function of T_{t-1} , capacity of teacher-training schools, and a "fall out" factor) and λ is the growth rate in students (a function of population change, enrollment ratios, and "fall out"). The authors have identified R and C as the most

No. 4 (Continued)

likely variables to be constrained, i.e. they are politically sensitive factors. We have imposed no bounds on l or h but some type of constraint could be imposed.

5. F Harbison and C. A. Myers, Education, Manpower and Economic Growth (New York: McGraw - Hill, 1964).