

criteria into a mean index of development (1972). According to this master criterion the Aegean is the most developed of the six followed by the South Central area while the East Central and the South East perform poorest. This index has a solid basis in common sense. The Aegean and South Central have the best literacy records and the highest proportions of the labor force working in wage paying jobs.

On the whole, economic conditions are quite dissimilar within Turkey. The growth of an industrial sector in the last ten years is a significant development, and we wish to underscore the varied nature of developments in agriculture. Total agricultural output has grown considerably in a period of population increase. But within the sector expansion has taken diverse forms depending on the crops cultivated, natural conditions and the availability of resources, and the nature of the techniques and organization applied in the various areas.

DEMOGRAPHIC CHARACTERISTICS

The population of Turkey has grown rapidly since the 1920's. However, the rate of growth has varied over time, and population growth has had an uneven incidence at the regional level. In the present chapter we consider some characteristics of demographic trends and structures in Turkey. Some results on differences in mortality, fertility, and migration patterns are presented, and several studies of the determinants of fertility and migration differentials are reviewed. Finally, we discuss the data which are used in our own investigation of the determinants of the Turkish demographic structure.

The peak years of population growth were between 1950 and 1960, but the growth rate remained high through the 1960's and 1970's (see Table 1-1). It is not possible to say precisely to what extent changes in mortality and/or fertility rates have affected the trend in the rate of population growth.* M. Macura has shown that adult mortality declined substantially between 1945 and 1960, and at a slower pace after that (1974). In a recent paper, drawing on the 1968 National Population Survey, he reports that infant mortality rates fell from 264 per thousand in 1944-45 to 158 per thousand in 1966-67 (Macura, 1975). Trends in Turkish fertility rates are harder to establish. Statistics from the Turkish

* Net in-migration has played a minor role over the years.

Demographic Survey of 1966-67* show a crude birth rate of 39.6 for all of Turkey for 1966-67, and there is no evidence that shows conclusively that the birth rate has fallen significantly since 1966-67.

Of interest are the pronounced regional variations in population growth rates. (We continue to rely on the nine region system, discussed in the last chapter.) In Table 2-1 we see that the Black Sea, Aegean, East Central, and North East regions have grown relatively slowly since 1940, while growth has been quite rapid in the Mediterranean and South East areas and around Istanbul. Furthermore, differences in the population growth of regions have become more pronounced over time. After 1960 the three fastest growth regions—the Mediterranean, the South East, and Marmara (Istanbul)—surged further ahead while the Black Sea region lagged farther behind. The dissimilar regional growth rates involve differing regional mortality, fertility, and migration patterns. Let us consider these in turn.

Only the most approximate indicators are available of mortality patterns by region. Using data obtained in the Turkish Demographic Survey for 1966-67 Macura (1974) finds life expectancy at birth for men and

*The Turkish Demographic Survey (TDS) was intended to be a continuing demographic survey of sample enumeration units scattered across the country. It was prepared by the Ministry of Health in cooperation with the State Institute of Statistics and the United States Agency for International Development. Unfortunately, the project was terminated after only two years in operation.

TABLE 2-1
FACTORS OF EXPANSION OF REGIONAL POPULATIONS

Region	1960/1940	1975/1940
North Central	1.53	2.24
Aegean	1.47	1.96
Marmara	1.58	2.64
Mediterranean	1.76	2.85
North East	1.52	1.98
South East	1.66	2.66
Black Sea	1.45	1.88
East Central	1.48	1.94
South Central	1.46	2.02
Total Country	1.56	2.28

Sources: Publications of the State Institute of Statistics.

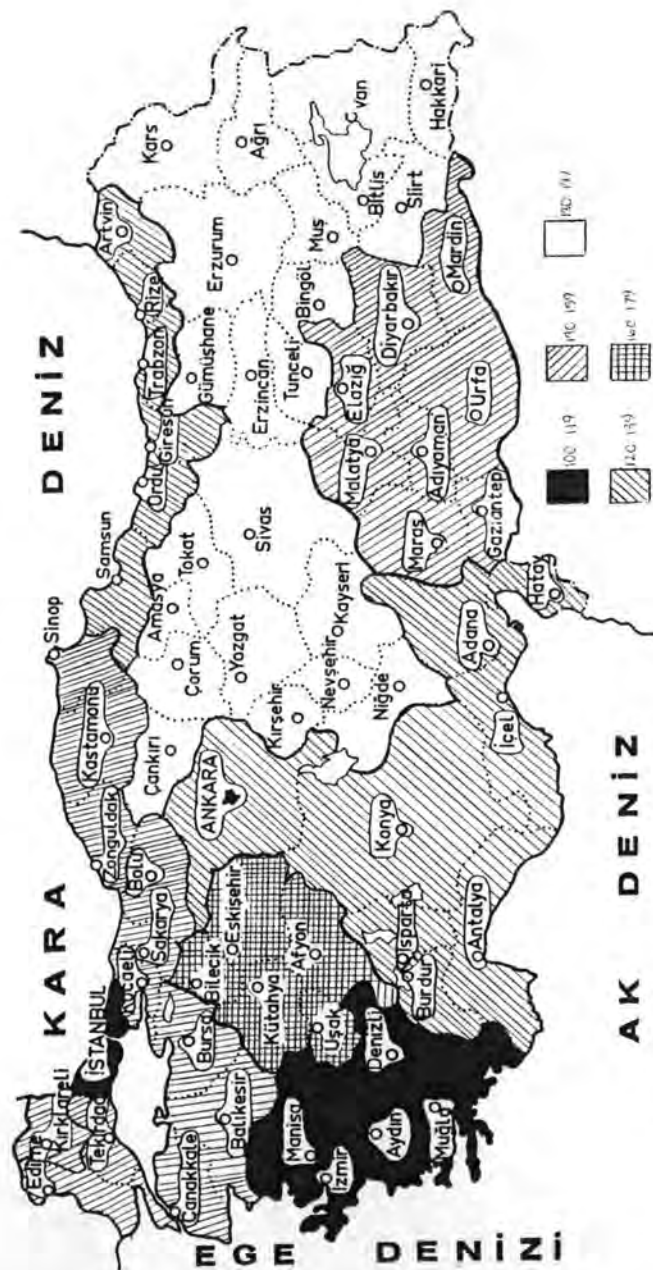
women to be significantly higher in the metropolitan cities of Ankara, Istanbul, Izmir (57.3 and 61.2 years) than in the Western and Mediterranean provinces* (53.5 and 56.1 years) and in the Central and Eastern provinces (45.6 and 49.4 years).** The nature of the regional and provincial differences can be investigated only for infant mortality rates. Here, Macura (1975) has used a one per cent sample of 1970 Census data to estimate infant death rates by province. Results (see Map 2-2) show Istanbul, Ankara and Konya provinces, the eastern Black Sea coast and the coastal area stretching from Izmir to Adana with the lowest and the Central and Eastern provinces with the highest rates. What is surprising is that the southeastern provinces have rates which are on par with those in the Marmara area and lower than those in the central and north eastern provinces and in the more developed Eskisehir-Afyon area. It is interesting that the Hellings using a very rough index of infant mortality conditions*** in 1935 develop provincial estimates that fall into a pattern very much like those appearing in Map 2-1 (the Hellings, 1958).

* Excluding the metropolitan cities.

** For the TDS a five region breakdown of Turkey was used. This is basically a more aggregated form of the nine region system. Our North East and South East become the Eastern Turkey region while our three central regions become the TDS regional of Central Anatolia.

*** (Males aged 5-9 per province)/(males aged one month per province).

MAP 2-1
INFANT DEATH RATES, 1968*



* Source: M. Macura (1974).

As regards trends in infant mortality Macura (1975) finds that regional differences in infant mortality have narrowed greatly.* This work though is highly tentative as there are acute problems arising in the confrontation between inadequate data sets and ambitious estimation techniques.

In short, there is little doubt that regional differences in mortality have long existed, and some evidence suggests that these differences have been narrowing. But the factors determining the different patterns have not been studied systematically.** Whatever the causes of the trends in mortality it is apparent that changes in mortality have not contributed to the diverging rates of expansion of regional populations.

Something is known about differential fertility rates. It was found in the Turkish Demographic Survey that the crude birth rate in

*

	Central	Black Sea	Western Turkey	Mediterranean	Eastern Anatolia
1944-45	.319	.276	.193	.197	.298
1966-67	.166	.160	.132	.110	.155

** In a study of data from small samples in the Ankara area, S. Cerit (1975) finds that infant mortality rates are highest in villages and lowest in metropolitan cities, and that within communities of various sizes the schooling levels of mothers and fathers and the occupations of fathers have independent effects on mortality rates.

different rural areas varies substantially, with the higher rates appearing in Central and East Anatolia (see Table 2-2). Likewise the mean number of children ever born and children surviving to women aged 45-49 in the different TDS sub-divisions show important differences (see Table 2-2) with the highest figures those for eastern Anatolia.

It is likely that the differences among areal fertility rates are of long standing. Here some indirect evidence may be introduced (Table 2-3). In a study of the 1945 Census the Hellings (1958) employ a crude fertility index and discover important regional differences in fertility rates. The Mediterranean, North East, South East, and East Central regions show up as higher fertility regions. A similar finding emerges when we calculate average children ever born for women aged 60-64 and 65-69 in 1970. In 1950, such women, then aged 35-39 and 40-44 would have been in the later years of childbearing. Women living in the Mediterranean, North East, South East and East Central regions were on average giving birth to 5.3 - 6.0 children in contrast to women in the Istanbul region and the Aegean and Black Sea regions where the average figures was less than 5 children ever born.

Recent information on fertility differentials can be extracted from the 1970 Census and the 1973 National Population Survey (Table 2-4). The fertility index is the number of surviving children of women aged

TABLE 2-2
TDS FERTILITY AND MORTALITY RATES

		Birth Rate	Death Rate	Mean No. of Children ever born	Children Surviving*
TURKEY	Total	39.6	14.6	5.3	4.1
	Rural	43.9	16.7	5.6	4.5
	Urban	31.4	10.7	4.8	3.5
	Ankara	31.2	9.4	4.2	3.3
	Istanbul	24.2	11.6	3.5	2.7
	Izmir	24.8	10.5	4.2	3.2
TDS REGIONS					
Central Anatolia	rural	52.7	21.7	6.5	4.5
	urban	34.7	11.2	5.8	4.0
Black Sea Coast	rural	38.1	14.9	5.4	4.0
	urban	34.7	10.5	4.9	3.7
Western Turkey	rural	35.6	14.7	5.2	3.6
	urban	26.5	10.9	4.3	3.2
Mediterranean	rural	40.3	13.2	5.8	4.4
	urban	31.9	8.9	4.7	3.7
Eastern Turkey	rural	49.7	15.5	6.5	5.0
	urban	43.9	12.2	7.0	5.0

* Women 45-49.

Source: Vital Statistics from the Turkish Demographic Survey 1966-1967, Ankara, 1970.

TABLE 2-3
INDIRECT EVIDENCE ON FERTILITY

Region	Average children ever born to		General Population Census of 1945 Fertility Index*
	Women aged 60-4	Women aged 65-9	
North Central	5.01	4.96	6.856
Aegean	4.55	4.44	6.042
Marmara	5.11	5.02	5.398
Mediterranean	5.76	5.67	7.961
North East	5.95	6.05	7.973
South East	5.59	5.62	9.335
Black Sea	4.84	4.82	7.032
East Central	5.28	5.28	7.791
South Central	5.20	5.09	7.374
Total	5.20	5.15	6.848

* derived from no. of males under five per province
total provincial population

Sources: General Population Censuses of 1945 and 1970.

40-44.* Averages per region calculated from the two sources are placed side by side. There is broad agreement between the two sets of figures. The survey sample sizes are quite inadequate in the North East and South East regions, but we again notice the pattern of relatively high fertility in the Mediterranean, North East, and South East regions observed earlier. The Black Sea, East Central, and South Central regions emerge as a zone of intermediate fertility rates. We note also that on average women marry much earlier and have more living children in rural areas. But between regions early marriage and high fertility are not highly correlated.

An important determinant of differential regional population growth rates has been internal migration. Internal migration movements grew in volume in the 1950's while international migration (which is nominally only temporary) rose sharply in the mid-1960's. Between 1927 and 1950 the proportion of the population living in urban areas changed from 23.6 to 24.9% only (Government of Turkey, 1975a). But by 1975 this proportion had reached 41.8%.* But there are great variations

* This fertility measure, which is used throughout this study, is the closest available approximation to the theoretical variable employed by economists in their studies of fertility. Inevitably, the measure is subject to reporting errors, but we have no reason to believe that such errors occur systematically within the populations sampled.

** Also, it is estimated that over one million Turks were living abroad in 1975, mainly in Western Europe.

TABLE 2-4

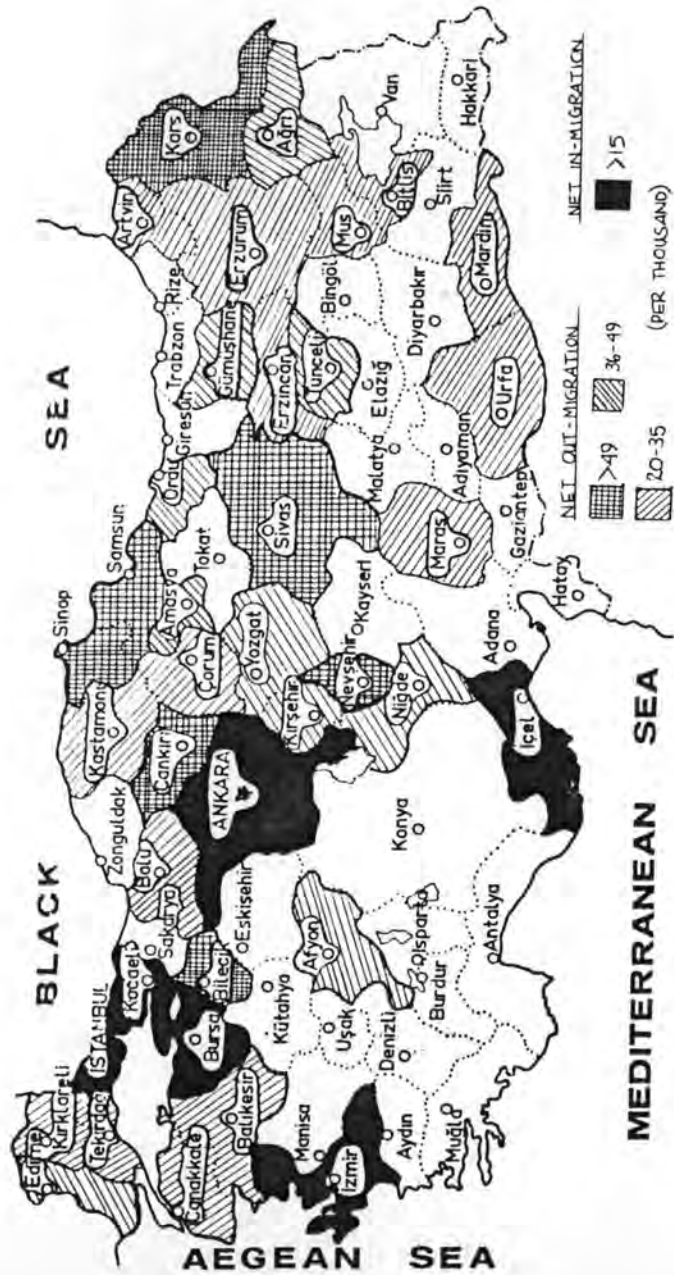
WOMEN AGED 40-49: FERTILITY AND AVERAGE AGE OF MARRIAGE
BY RURAL-URBAN RESIDENCE AND REGION, 1973

<u>Region</u>	<u>Number of women</u>	<u>Average age of marriage</u>	<u>Average number living children</u>	<u>Average number living children, 1970 Census</u>
North Central	94	18.92	3.93	3.81
Aegean	123	19.41	3.24	3.42
Marmara	162	19.97	3.11	3.34
Mediterranean	62	20.43	4.48	4.95
North East	15	18.67	4.53	4.73
South East	32	18.07	6.34	4.90
Black Sea	65	19.34	4.21	4.23
East Central	51	17.58	4.26	4.37
South Central	69	17.87	4.42	4.16
rural*	182	18.02	4.76	
urban**	436	19.83	3.54	

* Households in which agricultural income in 1972 was greater than 1000 Turkish Lira, non-agricultural income less than 10,000 Turkish Lira.

** Households in which agricultural income in 1972 was greater than 1000 Turkish Lira.

Sources: National Population Survey, 1973, Hacettepe University, Ankara, Turkey; Provincial Volumes, 1970 Census.



among provinces in the degree to which they send and receive migrants. As seen in Map 2-2 for the 1965-1970 period only the Istanbul-Bursa, Izmir, and Ankara areas grew significantly as a result of migration flows. The provinces which recorded high net out-migration rates are indicated on the map. Ankara and the Istanbul-Bursa area are ringed by supply provinces, while broadly speaking, the major source area appears to be the north-northeastern belt of provinces. However, in the context of a general upsurge in internal migration in Turkey what we find surprising are the islands of stability: the many provinces such as Tokat, Konya, and Mugla which lost or gained only negligible numbers as a result of migration (see Table 2-5).

The determinants of differentials in Turkish fertility and migration rates have been investigated by several writers. The fertility studies of Timur (1974) and Farooq and Tuncer (1974) merit attention. These studies are of an exploratory nature: the authors seek to determine if Turkish fertility rates vary in the expected ways with respect to assorted socio-economic indicators. Timur's general hypothesis is that "Taken as a whole the population of Turkey may be placed in the early stages of the demographic transition." (1974, p. 27). Timur draws on a 1968 National Population Survey: for women in various categories she calculates mean children ever born, where the fertility data are standardized for duration of marriage. Her findings include the following points: illiterate women had 4.2 children, women with

PROVINCIAL NET IN-MIGRATION RATES*

Adana	+ .007	İzmir	+ .050
Adiyaman	- .017	Kars	- .051
Afyon	- .041	Kastamonu	- .028
Agri	- .038	Kayseri	+ .008
Anasya	- .042	Kirklareli	- .032
Ankara	+ .083	Kirşehir	- .036
Antalya	+ .007	Kocaeli	+ .052
Artvin	- .028	Konya	- .001
Aydin	- .010	Kütahya	- .011
Balikesir	- .024	Malatya	- .018
Bilecik	- .086	Manisa	- .004
Bingöl	- .012	Maraş	- .035
Bitlis	- .020	Mardin	- .029
Bolu	- .027	Muğla	- .000
Burdur	- .016	Muş	- .025
Bursa	+ .028	Nevşehir	- .065
Çanakkale	- .022	Niğde	- .040
Çankiri	- .056	Ordu	- .036
Çorum	- .031	Rize	- .015
Denizli	- .009	Sakarya	- .001
Diyarbakir	- .005	Samsun	- .059
Edirne	- .036	Siirt	- .001
Elazığ	- .019	Sinop	- .061
Erzincan	- .028	Sivas	- .049
Erzurum	- .032	Tekirdağ	- .023
Eskişehir	+ .010	Tokat	- .012
Gaziantep	+ .009	Trabzon	- .002
Giresun	- .010	Tunçeli	- .047
Gümüşhane	- .040	Urfa	- .027
Hakkari	- .008	Uşak	- .009
Hatay	+ .006	Van	- .010
Isparta	+ .003	Yozgat	- .040
İçel	+ .015	Zonguldak	+ .013
İstanbul	+ .161		

* (Total number of in-migrants, 1965-70 less total number of out-migrants, 1965-70)

 1965 population

SOURCE: Tabulations made available by the State Institute of Statistics.

only a few years of primary school 3.2 children, women who attended primary school 2.8 children, and women who completed secondary school 2.0 children. In addition, the wives of businessmen had 2.8 children, of professionals 2.3 children, of clerks and junior civil servants 3.1 children, of artisans and small shopkeepers 3.5, of workers 4.4, and of farmers and farm workers 4.4. Another important finding relates to income: for the sample as a whole fertility declines with income, but in towns and villages a U-shaped curve in fertility-income space can be discerned.

Like Timur, Farooq and Tuncer also operate within the framework of the demographic transition theory, although they employ a more sophisticated approach. Using regression analysis they estimate the influence of female literacy rates at the provincial level on fertility rates. Fertility rates, corrected for percentages married, are estimated for each province by means of a reverse projection technique using census data on age groups and total populations. The literacy proportions are taken from the 1945, 1950, 1955, and 1960 censuses. The regressions are run for each census year separately and a pooled result is obtained. Farooq and Tuncer find that literacy has had a stable and substantially negative influence on fertility in Turkey over time. They conclude that "in Turkey continued modernization will result in a continued decline in the fertility rate" (1974, p. 273).

These fertility studies are above fault in attempting to make sense of data using a widely accepted theoretical approach. The problems that appear are those of the theory itself. Timur is grappling with the question of whether the transition theory can become a micro theory: Should individual fertility levels vary with levels recorded for various socio-economic characteristics? Are these socio-economic variables close substitutes for one another? Her results consist of tabulations of fertility according to characteristics such as education, occupation, income and so forth, but she never attempts to estimate the effects of each variable while controlling for the effects of the others. Finally, some of Timur's results run counter to the transition theory: rural fertility in some areas is as low as urban fertility; the fertility of urban workers is the same as that of farmers and farm workers.

Farooq and Tuncer adopt literacy as their principal explanatory variable. Literacy is taken as an index of industrialization, urbanization, and per capita income levels, while in itself literacy is seen as a measure of "the subjective costs of unwanted pregnancies." One question is why literacy is made to serve as an indicator since data are available on the other aspects of development. In fact, industrialization, urbanization, and literacy and per capita income, while interdependent, are never perfectly correlated, and are not necessarily synonymous with one another. The results show that literacy as an index of modernization affects fertility, but the question remains open

of whether one aspect or mechanism of development has a critical influence on fertility.

The problem of differences in migration tendencies, especially at the provincial level, is hardly recognized in the literature. In Turkey it is known that in some areas there is a tradition of seasonal migration to find work in agriculture or permanent migration to cities by those who have learned skills like baking or carpentry. Also, many have commented that the introduction of cotton cultivation in the Mediterranean and South East regions led to the substitution of wage labor for share-cropping, and to a large migration to the cities. One study is that of Munro (1974) whose model looks to factors which depress economic conditions in regions of origin and ignores attractions in destination regions. The dependent variable is the provincial rate of lifetime migration to the rest of Turkey, calculated from the 1965 census. The migrant is regarded as responding to a variety of economic conditions in the region or origin. Munro concludes that out-migration should be highest from provinces with the following characteristics: low level of urbanization, high literacy rate, low average incomes in non-agricultural employment in the province, and little cultivation of industrial crops. The model succeeds in explaining 78% in the variance of the dependent variable. However, it is not clear what sort of explanation is being advanced, how the explanatory factors are tied together, and what the underlying mechanisms are.

The fertility and migration studies just discussed amount to a careful reconnaissance of the data. The results, however tentative, are important: fertility and migration rates seem to depend closely on various indicators of economic development. Our aim in this thesis is to look further at the apparent ties between demographic and socio-economic indicators in Turkey. We exploit new data sources and attempt to develop several models of economic demographic interrelations.

Data used in the study

This study draws on two previously unexploited sets of data: a national population survey conducted by Hacettepe University in 1973 and a special tabulation at the county level of the 1970 Population Census. We also introduce information drawn from the Village Inventory Studies which date mainly from the late 1960's. We will discuss these sources in turn.

The 1973 Survey of Population Problems was the third, following the 1963 and 1968 surveys, national sample survey of the Turkish population. The sample design was multi-stage. The five region breakdown of the Turkish Demographic Survey was used, and within regions the population was stratified according to the size of place of residence. Seven such residence strata were defined and applied to each region. Interviews were allocated in proportion to the population

totals in each strata.* Within strata, clusters of households were defined and chosen randomly for interviewing.

In the survey some 6530 households were contacted. In each household all currently married women under the age of 50 were interviewed as were the adult males present. Questions, 176 for the women and 193 for the men, were asked by school teachers and fourth year university students who had received two weeks of training. Team supervisors edited questionnaires and checked for consistency in answers. Further editing, coding, punching, and systematic consistency checking were carried out in Ankara. A response rate of 90% was reported.

A wealth of demographic and socio-economic information from the 6530 households was collected. We were permitted to use a subset of the data obtained in the 1973 survey. Our use of these data and our results are discussed in the Chapter below.

The 1970 Census was the ninth census since the establishment of the Turkish Republic in 1923. The first was in 1927 and beginning in 1935 censuses have been conducted every five years. The census is carried out in a single day and is based on a de facto principle--an Ankara resident visiting Izmir on Census Day is counted in the population of Izmir.

* With the additional constraint that at least 1500 interviews would be carried out in settlements with population less than 2000.

The Census is comprehensive in scope. The 1970 questionnaire follows United Nations recommendations and provides information on the composition of households and the social and economic characteristics of household members. In connection with the 1970 Census an expanded set of cross tabulations were made available at the provincial level.

However, many of Turkey's provinces are large enough to harbor quite diverse conditions. Smaller units are more homogeneous. The administrative unit beneath the province is the county, and there are 572 such units in Turkey. Tabulations of the 1970 census for 252 of these units were made available. These 252 counties were selected as representative of conditions in six of Turkey's nine agricultural regions.*

County populations vary between 6094 and 582,550 (Izmir), but hover around a mean of 54,296. The counties are administrative and political units. But economic and cultural conditions are also relatively uniform within counties. Therefore, we will treat counties as communities knowing full well that counties are in turn aggregates of districts, sub-districts and villages.

* Data for all nine regions could not be obtained; so, we excluded the Ankara, Istanbul, and Adana regions because of their relatively high concentrations of industrial employment. However, the counties of one province of the North Central region (Yozgat) were made available. We elected to include these counties with those in the group drawn from the East Central region.

The people living in our counties work mainly in agriculture, and our model relates to demographic patterns in regions that are predominantly agricultural. But agricultural communities are likely to be affected in diverse ways if centers of non-agricultural employment develop nearby. For this reason, our sample does not consist exclusively of rural counties, although 231 of the 252 counties have more than 50% of the male labor force in agriculture,* and only five counties have less than 30% of the male labor force in agriculture.

Supplementary information was obtained from the Village Inventory Studies carried out mainly in the late 1960's by the Ministry of Village Affairs. The volumes containing information on our counties were published between 1965 and 1971. The Village Inventory was a comprehensive study of village economic activities. Results were published in aggregate form with counties as the lowest level of aggregation. The inventory volumes contain a wealth of information, but comparability is problematic because the data were collected at different times. The quality of these data is discussed in an essay on Turkish agriculture by Boratov (1972) and in a study of land tenure in Turkey by Miller and

* In only six of the 252 counties are less than two-thirds of the female labor force working in agriculture.

Cetin (1974). The authors find that the data on land ownership in Turkey seem to be accurate. Indices that refer to the distribution of lands among families are not likely to change abruptly in any case. And to this extent only we draw on the Village Inventory studies.

THE TRANSITION THEORY AND THE REACTION TO IT

In Chapters Three and Four we consider some well known models of economic-demographic interactions which may help us account for the striking variations in demographic behavior which appear in developing countries such as Turkey. Chapter Three consists mainly of a critical review of the demographic transition theory. We argue that for a number of reasons the transition theory is not an adequate framework for the explanation of demographic phenomena. In the latter part of this chapter we discuss briefly an approach to macro modelling that could eventually replace the transition theory. In Chapter Four, we go on to an evaluation of some individual decision-making approaches to the analysis of fertility behavior.

The transition theory

In the classical view of the economic mechanism progress is linked to capital accumulation and the rate of population growth. The simple Ricardian model is a complete theory of accumulation, population growth and change in real income. Population growth and economic growth are both endogenous. Population is held to grow in response to increases in the total wages fund, while profits, accumulation, and growth in the next period depend in turn on the extent to which diminishing returns have set in. The interaction between population growth and