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## Comparison of the Service Areas of Major Universities in Turkey

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Europe quo vadis? – Regional Questions at the Turn of the Century

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## COMPARISON OF THE SERVICE AREAS OF MAJOR UNIVERSITIES IN TURKEY

### ABSTRACT

Urbanization and an increase in the workforce in many sectors in Turkey have led to an increase in demand for higher education in recent years. To satisfy this demand, the student capacity of existing universities has been increased, while new universities have been founded. This study investigates the influence of major universities in Turkey in order to evaluate their efficiency.

Previous studies take into consideration different variables for locational decisions of the universities such as population, employment, educational level, income, educational facilities, etc. In recent years, many studies in the field of educational planning both in national and regional base, have also included the location and distribution of facilities of each level of the educational system. Few of these studies are based on the analytical research for university location. Therefore, this study investigates major universities by taking into consideration; the size of the university, distance to the university, population of the provinces, socio-economic factors such as employment, educational level, income, students, educational facilities and social facilities of the origin provinces. The result of the study can be used to determine the growth strategies of the universities. Also it gives general information about the service areas of the major universities in Turkey.

## 1. INTRODUCTION

As many developing countries, urbanization and an increase in the workforce in all sectors in Turkey has led to an increase in demand of higher education. In recent years to respond the demand two methods has been followed. Firstly, the student capacity of existing universities has been increased especially in major state universities. Secondly, new universities has been founded as state and private ones. Although the new private universities have been concentrated in Ankara and Istanbul, the new state universities have been distributed to different provinces. This have been made to raise the educational potential in underdeveloped regions and encourage regional development. But it has been failed to attract staff and students. Likewise, for the existing universities, increase in the student capacity has caused some problems like the inadequate space of university campuses and budgets, the poor quality of education etc. Major and old state universities are influenced by the foundation of new private universities. In this time, it can be likely to choose two alternatives for the major state universities. They must either compete to new ones or remain in the own condition that this can cause the change of the student structure in the state universities. Because of this the major state universities must determine the own growth strategies and the university service areas.

The literature survey on university planning at the regional level have been made a lot of empirical studies so far. For example, important research has been developed by John Quincy Steward (1947) in A.B.D. in 1940s. In this study, a gravity model for universities had been tested. He had been examined the service areas of universities like Princeton, Harvard and M. I. T. and the attractive powers of these universities was appropriate for the gravity model. Also the various studies has been improved after 1960 in Europe. Geissler (1967) determined the influence areas of existing universities in Germany by taking into consideration the percentage of students attracted and identified areas where new university. In recent years, many studies about university have included the location and optimization models for university. According to a study was performed by Koroglu (1992), a model was developed in order to determine the optimum locations of new universities by taking into consideration the socio-economic characteristic of university sites and demand points in Turkey.

## 2. THE UNIVERSITY SYSTEM IN TURKEY

The university system in Turkey is owned both by central government or private sectors but, location, student capacity, curricula, budget, academic staff and personnel of universities are determined by central government through its authorized institutions. According to the Act No:2547 a state board for higher education was formed to which all universities are responsible. Part of the responsibility of this board was to provide staff to universities, to determine the capacity and budget of every universities and to allocate new students to universities each year.

Prior to the end of the 1960s there were eight universities in Turkey which are placed two in Istanbul, three in Ankara, one in Izmir, and one each in Erzurum and in Trabzon. In the 1970s, it was decided to found in the cities of Adana, Bursa, Eskişehir, Konya, Kayseri, Samsun, Diyarbakır, Malatya, Elazığ and Sivas. Between these locations, only Adana and Bursa were large cities. The system of new founded universities have not high student capacity because of several lack of facilities and staff necessary to give education to increased number of student. In 1981, the system expanded and the number of universities increased to 27. In this period, academies and colleges in large cities and smaller towns were upgraded to university status. This decision caused to a total of 27 universities allocated to 18 cities. In 1990 the number of universities increased to 29. After Act No:3837 was came into force in 1992, it was decided to found 21 new universities. In 1993 the number of faculties were 473 and this number increased sharply to 791 in 1994 and to 903 in 1995. By 2012 the total number existing universities and new universities which will be founded will have reached to 74.

Because there are not enough facilities and instructors to meet the demand for higher education, only a relatively small portion of high school graduates (about 10-12 %) are able to study in a university. For this reason, student admissions are determined by a centralized testing system. Since 1970s students have been accepted into universities by passing a general examination. The university exam has two stages. In first stage, students can prefer to the vocational studies. In the second stage, according to the student score in her/his entrance examination and student's preference list of desired fields of study, the student is placed.

This systems is appropriate in case of all citites have the same socio-economic level but there is not equality between all cities in Turkey (Figure 1) This situation affects the proportion of success of the entrance to the university.

In general, nominee students from the larger cities and higher socio-economic strata are in the best position. Because they are able to make high score and to enter the universities in larger cities. On the other hand, only the best of the nominee students from smaller towns and lower socio-economic strata are able to enter state universities in larger cities. Because of this generally they prefer a university near their own homes.

### 3. THE METHOD OF COMPARISON SERVICE AREAS OF THREE MAJOR UNIVERSITIES

#### 3.1 Determining of Variables

For this study, various variables are needed. The number of students who came from each provinces can be used as a variable. According to results of 1996-1997 the university entrance examination; distance from each province to the examined university, population in the demand points and socio-economic statements of the origin provinces are taken. Here, dependent variable is taken as number of students who came from each provinces according to 1996-1997 the university entrance examination. In Figure 2, 3, and 4, student numbers are shown for Bogazici University, Istanbul Technical University and Middle East Technical University.

According to Figure 2, the high number of students came from Istanbul, Izmir and Ankara to B.U. can be seen easily. Besides, the number of students from provinces in the surrounding of İstanbul is high. If a comparison is made between Figure 1 and 2, it can be concluded that the students enter to the Bogazici University not only due to distance but also due to the socio- economic index of the their province.

According to Figure 3, it can be observed that the density of students in Istanbul, Ankara and Izmir. Furthermore, it can be also noticed that the number of students who came from

provinces the west of Anatolia are extremely high. This situation in the Figure 3, seems similar the ones in Figure 1.

In Figure 3, the distribution of students of M.E.T.U is shown. In M.E.T.U., the students are distributed more homogeneously with respect to the other two universities. Extensive portion of the students came from Ankara, Istanbul and Izmir. Furthermore, it can be also seen that an important amount of student came from provinces the surrounding of Istanbul , the west and south of Anatolia.

Here, socio-economic index values constitutes each variables by taking into consideration the defined weight. In 1995, The State Planning Authority was made a research. According to this research, cities were divided into five categories concerning the statement of the socio-economic development. In this study for every province, a socio-economic index was determined as can be seen in Figure 1. This index has many variables. These can be grouped as below:

- Related to population indicators
- Related to employment indicators
- Related to health indicators
- Related to industrial indicators
- Related to agricultural indicators
- Related to contruction indicators
- Related to finance indicators
- The other comfort indicators.

### 3.2 Regression Anaysis

It is made multiple regression the between dependent variable and independent variables for each three universities.

$$Y = ax_1 + bx_2 + cx_3$$

Y : Students numbers who came from each province to each university

$x_1$  : Distance to the university

$x_2$  : Population in demand points

$x_3$  : Socio-economic index

While examining the obtained data for I.T.U. , it can be seen that the relation between y and  $x_1$  is a decreasing linear relation while the relation between y and  $x_2$  is an increasing linear relation. Additionally, the relation between y and  $x_3$  can be defined as an increasing linear relation. These relations are shown in Graph 1.

Multiple Regression analysis was made between y,  $x_1$ ,  $x_2$ ,  $x_3$ . The results are shown below:

Multiple R : 0.93869

R Square : 0.88114

Adjusted R Square : 0.87746

Standard Error : 27,13224

Analysis of Variance	DF	Sum of Squares	Mean Square
Regression	3	949901,78639	316633,92880
Residual	60	128132,15111	2135,53585

F=115,57419    Signif F= ,0000

Variable	B	SE B	Beta	T    Sig T
$X_1$	-0,055038	0,021533	-0,172584	-2,556    0,0131
$X_2$	1,25986E-04	1,0336E-05	1,102910	12,189    0,000
$X_3$	-34,824640	14,550673	-0,267582	-2,393    0,0198
Constant	-26,711965	15,844558		-1,686    0,0970

According to these results, there exist high correlation between variables. The correlation coefficient is high and meaningful.

While examining the data for B.U., it can be seen that there is a decreasing linear relation between y and  $x_1$ . An increasing linear relation exists between y and  $x_2$  while an increasing linear relation exists between y and  $x_3$  (Graph 2).

Multiple Regression analysis was made between y,  $x_1$ ,  $x_2$ ,  $x_3$ . The results are shown below:

Multiple R : 0.94081

R Square : 0.88512

Adjusted R Square : 0.87746

Standard Error : 27,13224

Analysis of Variance	DF	Sum of Squares	Mean Square
Regression	3	255242,71200	85080,90400
Residual	45	33127,12474	736,15833

F=115,57419    Signif F= ,0000

Variable	B	SE B	Beta	T   Sig T
X <sub>1</sub>	-0,049060	0,014240	-0,218682	-3,445   0,012
X <sub>2</sub>	7,05424E-05	6,2305E-06	1,153240	11,322   0,000
X <sub>3</sub>	-25,063179	8,601056	-0,332489	-2,914   0,0055
Constant	-10,613527	10,281234		-1,032   0,3074

According to this result, there exist high correlation between variables. The correlation coefficient is high and meaningful.

After the evaluation of the data of M.E.T.U, it can be seen that the relation between y and x<sub>1</sub> is a decreasing linear relation, the relation between y and x<sub>2</sub> is an increasing linear relation and the relation between y and x<sub>3</sub> is an increasing linear relation (Graph 3).

Multiple Regression analysis was made between y, x<sub>1</sub>, x<sub>2</sub>, x<sub>3</sub>. The results are shown below:

Multiple R            : 0.64779

R Square             : 0.41963

Adjusted R Square : 0.39284

Standard Error      : 93,57821

Analysis of Variance	DF	Sum of Squares	Mean Square
Regression	3	411545,18633	137181,72878
Residual	65	569197,24845	8756,88075

F=15,66559    Signif F= ,0000

Variable	B	SE B	Beta	T   Sig T
X <sub>1</sub>	-0,018042	0,045779	-0,043290	-0,394   0,6948
X <sub>2</sub>	1,06703E-05	1,8347E-05	0,098767	0,582   0,5629
X <sub>3</sub>	66,275204	22,176769	0,548434	2,988   0,0040
Constant	34,023505	26,947426		1,263   0,2112



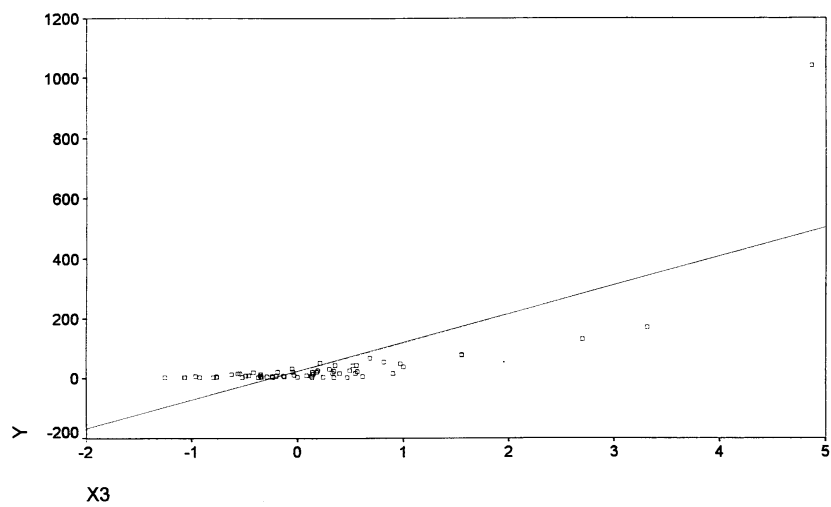
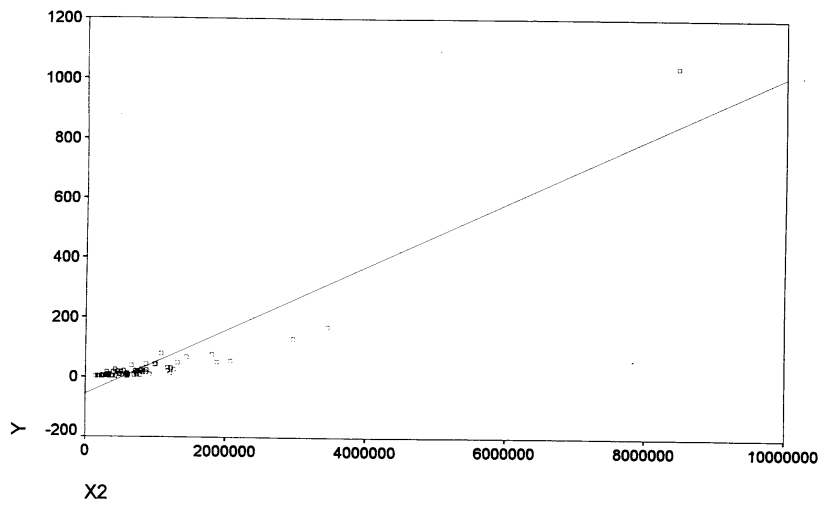
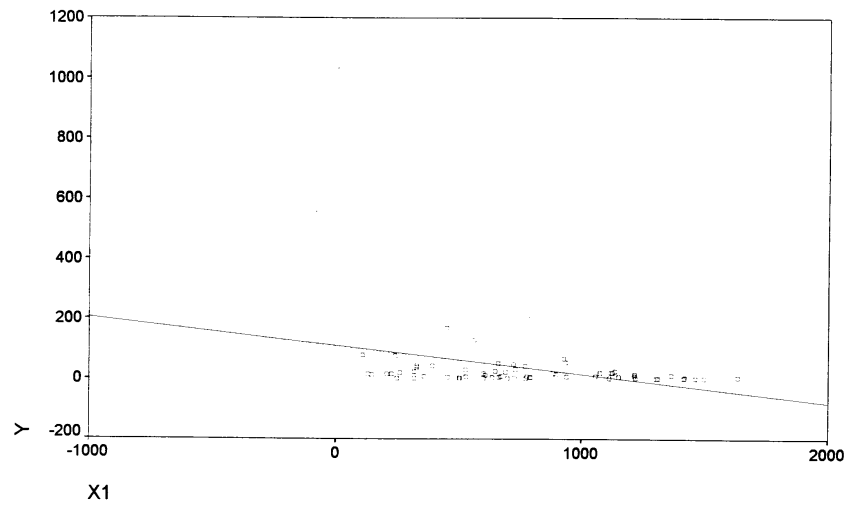
According to these results, there exist considerable amount of correlation between variables. The correlation coefficient is meaningful.

#### 4. CONCLUSION

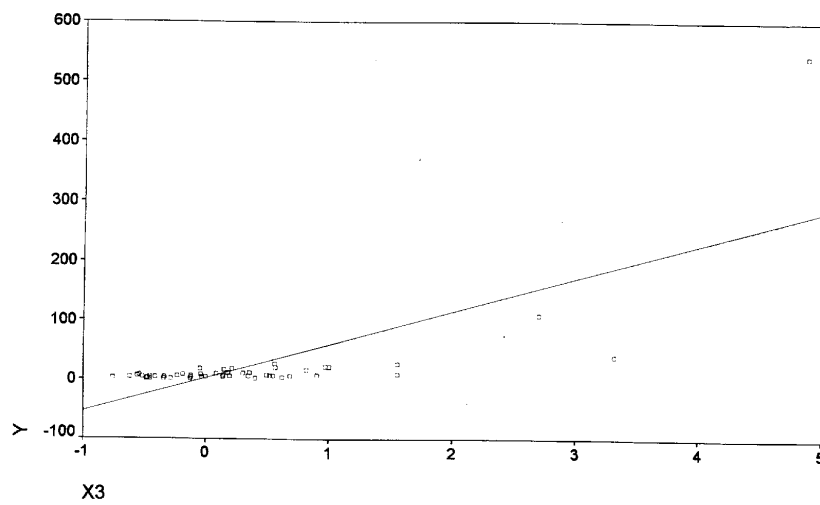
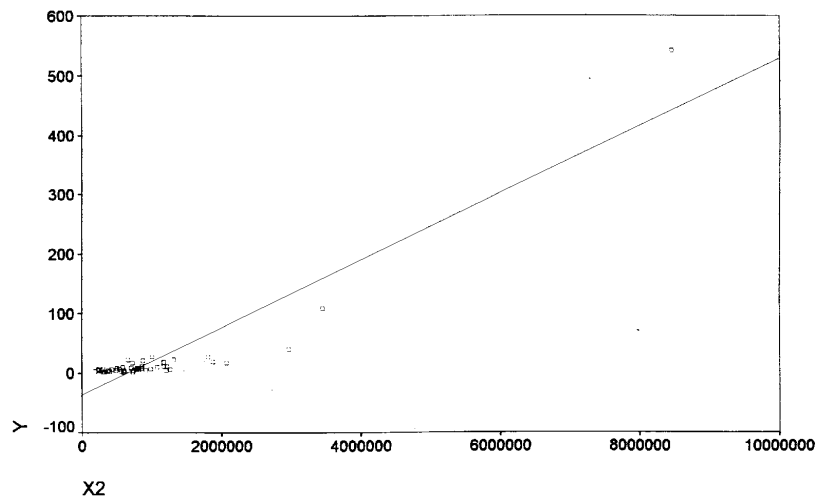
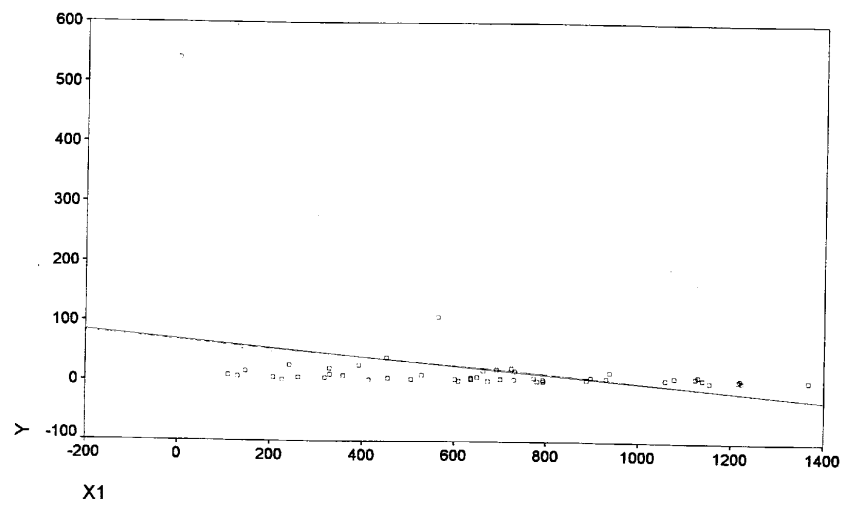
After evaluation of the results of the regression analyses, it can be concluded that the number of students who came from each province for the three universities, mainly depends on the distance between the province and university, the population of the province and socio-economic index of province. The results show also that the influence area of M.E.T.U. is much wider than the two other ones. The main reason is probably that the location of M.E.T.U which is in mid-Anatolia. However, the major part of students of I.T.U and B.U came from the provinces which have high socio-economic index.

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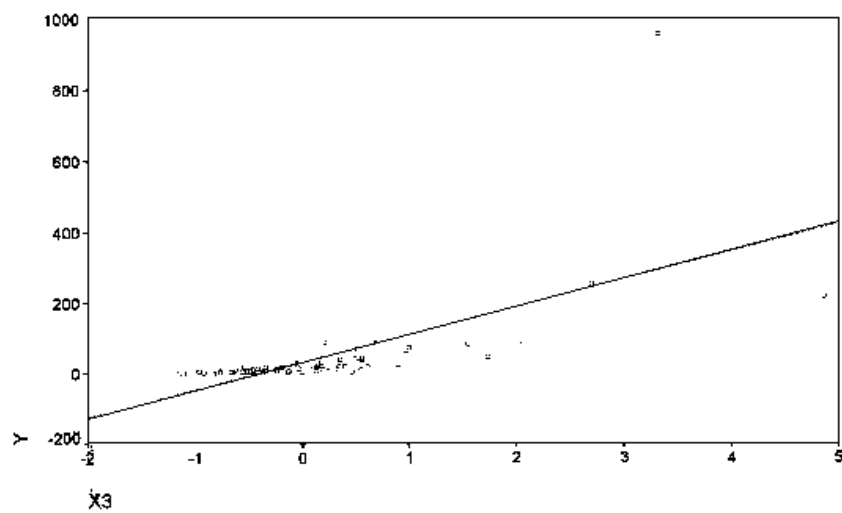
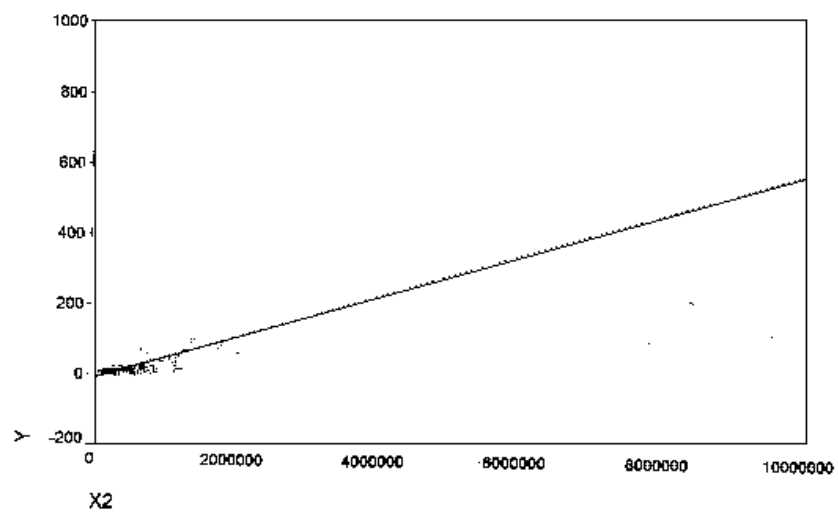
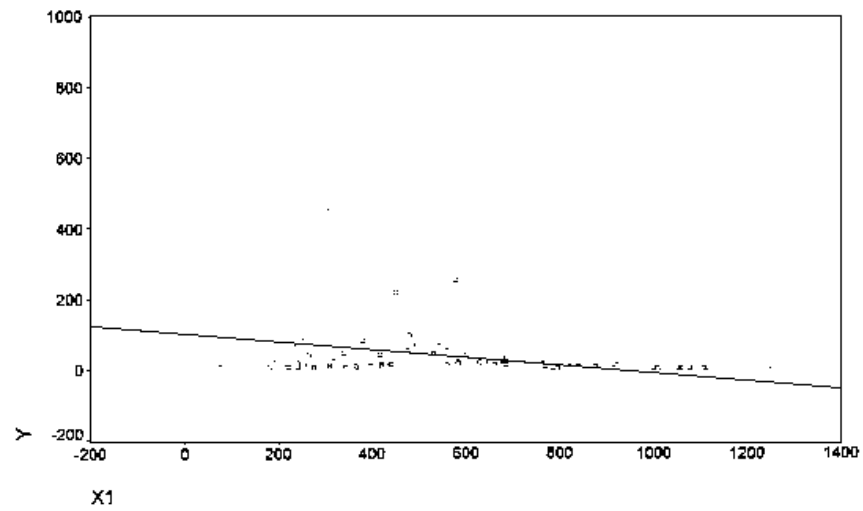
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GRAPH 1. Regression Analysis Curves for I.TU.



GRAPH 2. Regression Analysis Curves of B.U.



GRAPH 3. Regression Analysis Curves for M.E.T.U.

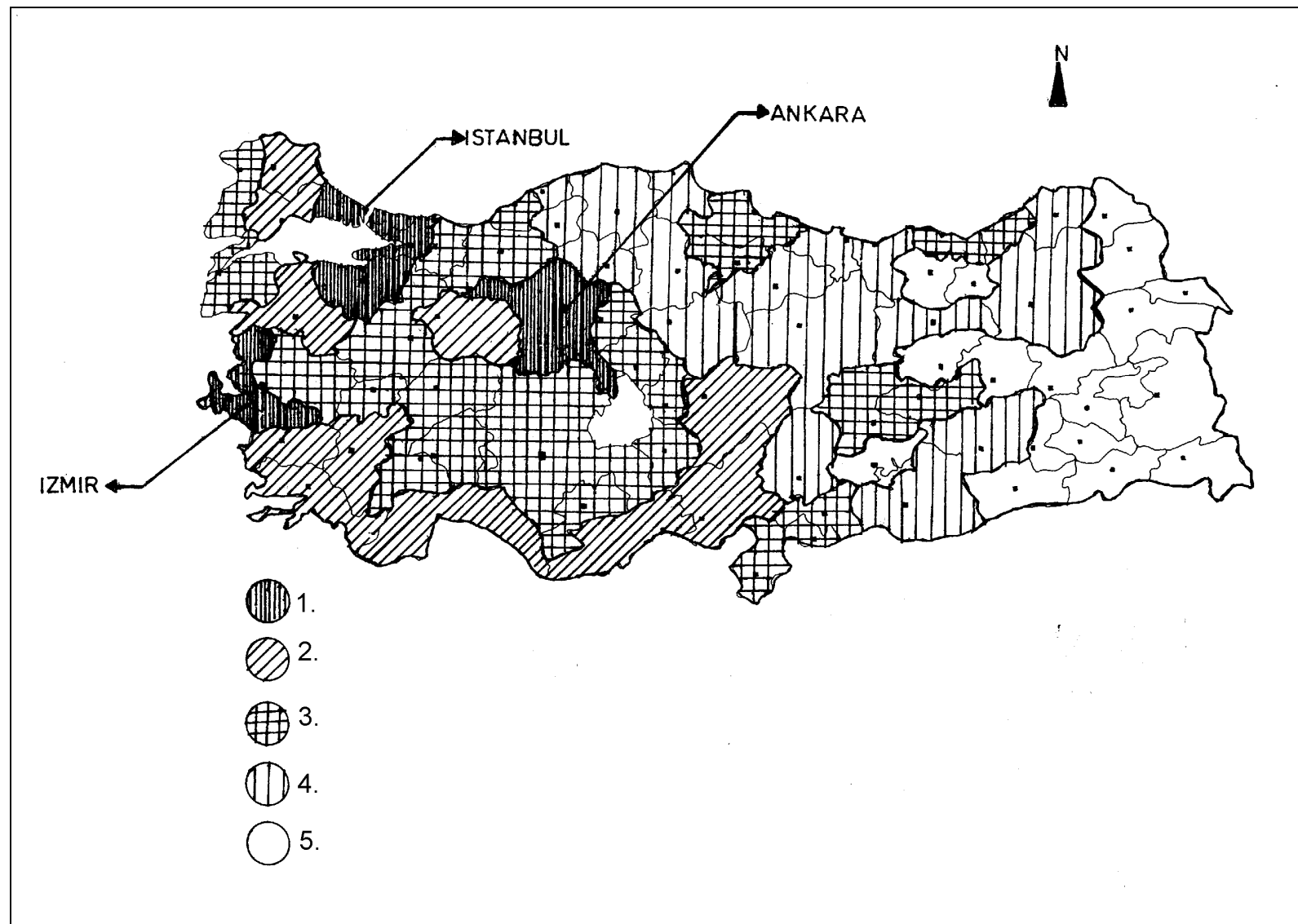


FIGURE 1. Socio-Economic Index Map of Turkey

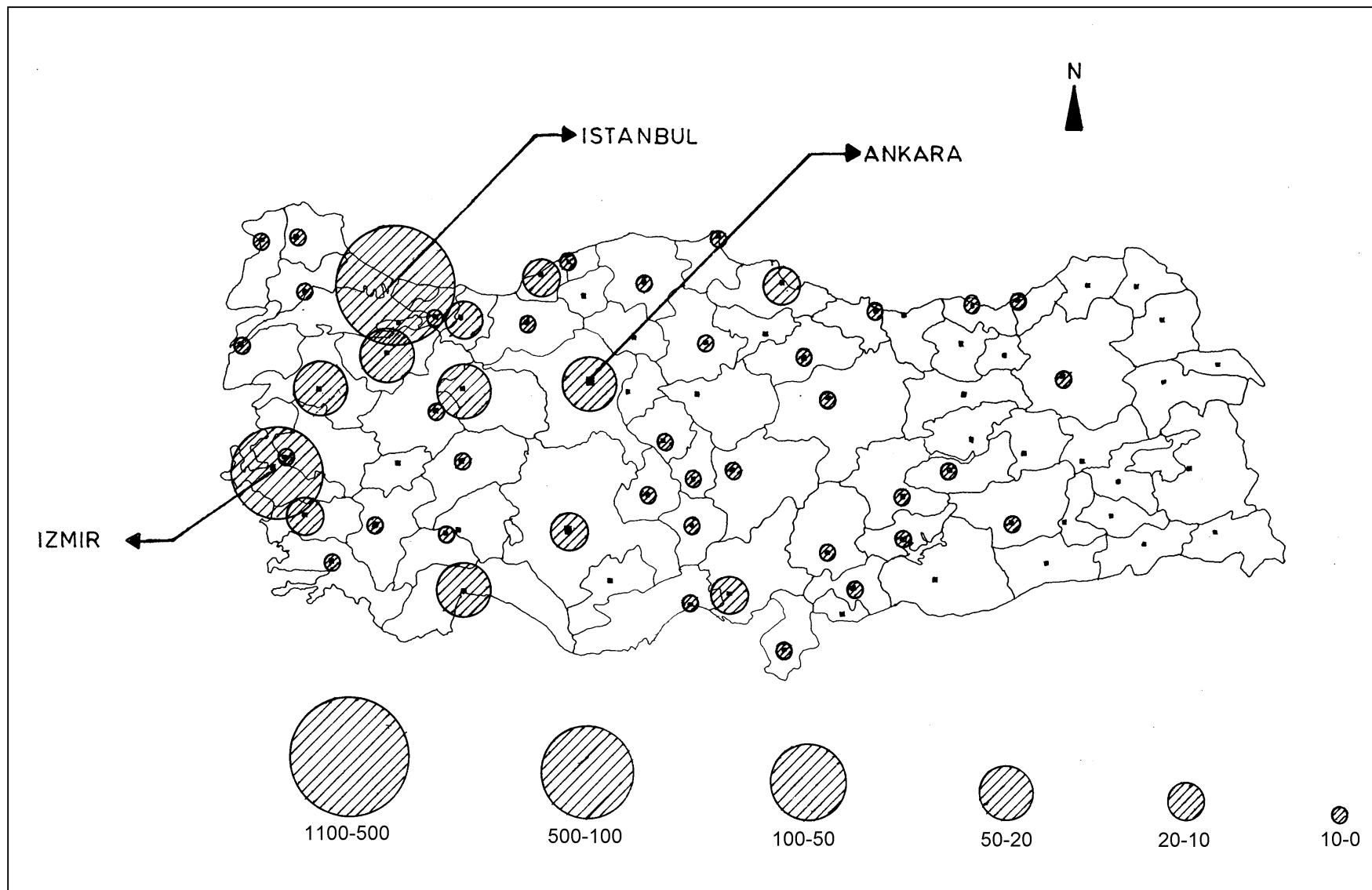


FIGURE 2. The Number of Students Who Came From Each Province to B.U.

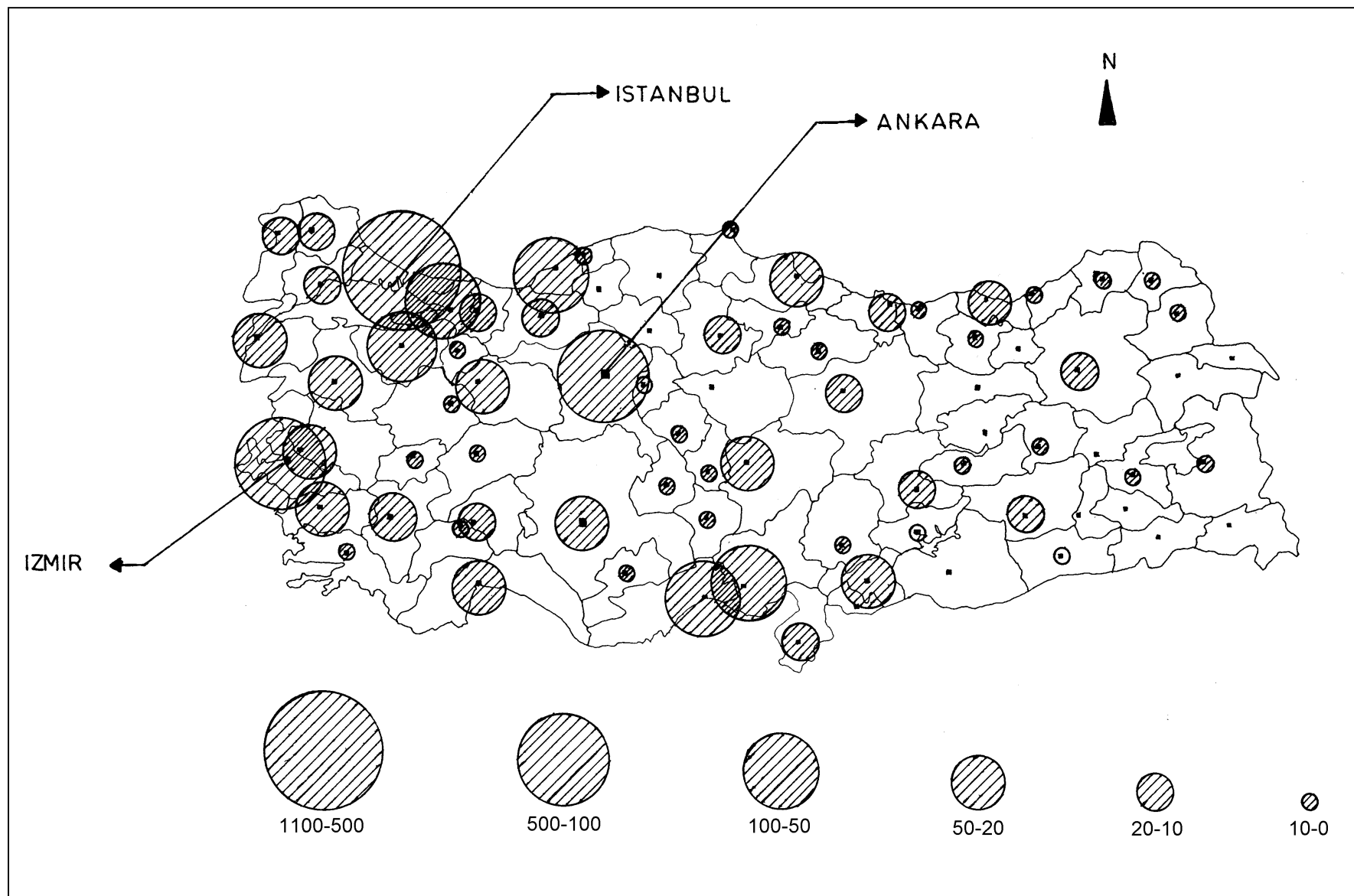


FIGURE 3. The Number of Students Who Came From Each Province to I.T.U.

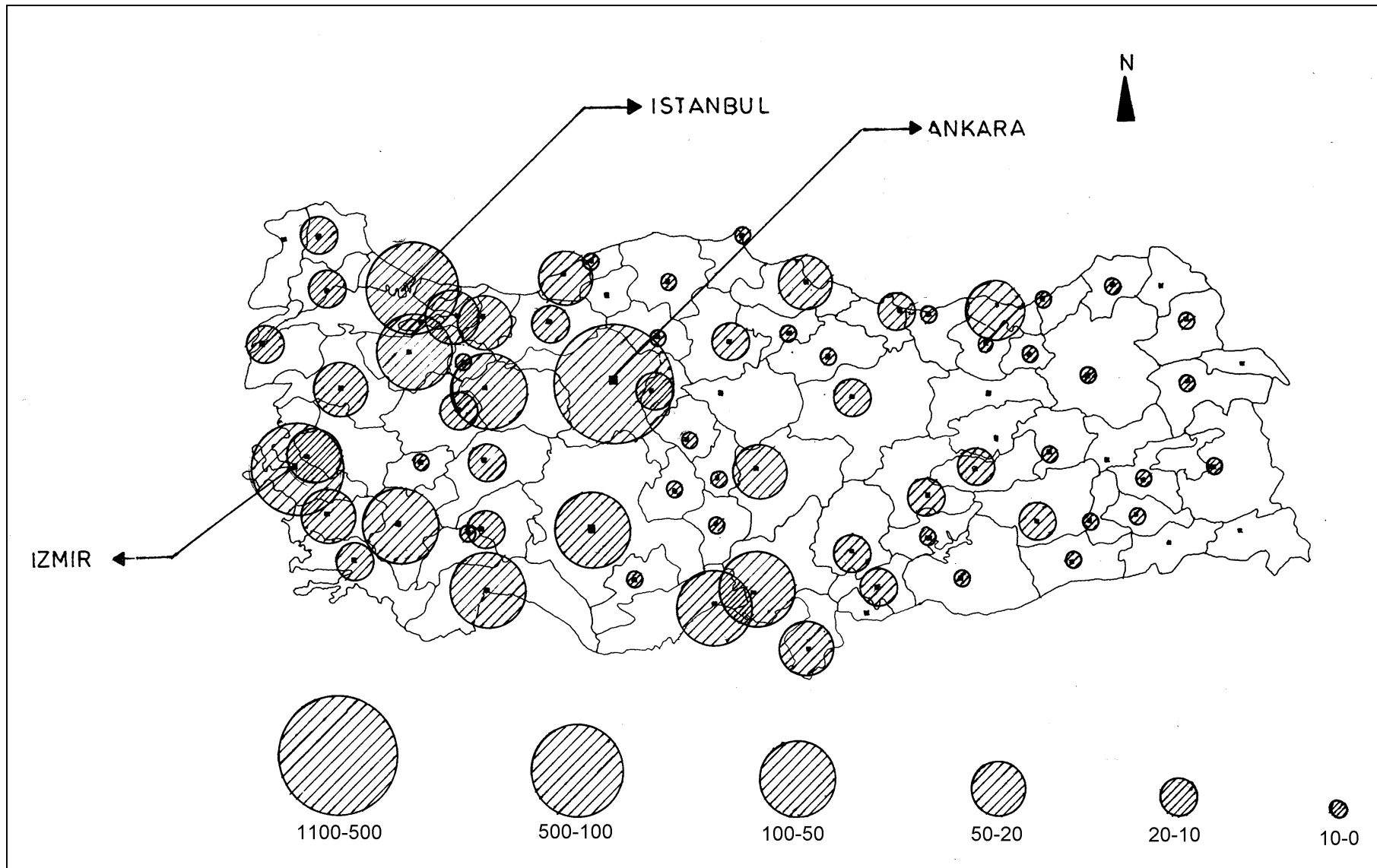


FIGURE 4. The Number of Students Who Came From Each Province to M.E.T.U.